SCCRCIS

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SANTA CLARA COUNTY REGIONAL CONSERVATION INVESTMENT STRATEGY

Open Space Authority Santa Clara Valley
Valley Transportation Authority
Coastal Conservancy
Jodi McGraw Consulting
The Nature Conservancy
Conservation Strategy Group
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Santa Clara County Regional Conservation Investment Strategy

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Acronyms and Abbreviations

ABAG	Association of Bay Area Governments
Authority	Santa Clara Valley Open Space Authority
BAARI	Bay Area Aquatic Resource Inventory, version 2.0
Bay Area	San Francisco Bay Area
Caltrans	California Department of Transportation
CCED	California Conservation Easement Database
CDFW	California Department of Fish and Wildlife
CEHCP	California Essential Habitat Connectivity Project
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CLN	Conservation Lands Network
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Coastal Conservancy	California State Coastal Conservancy
Corps	U.S. Army Corps of Engineers
CPAD	California Protected Areas Database
CPUs	conservation planning units
Critical Linkages	Critical Linkages: Bay Area and Beyond
CROS	California Roadkill Observation System
CV	Climate Vulnerable
DPS	distinct population segment
GIS	geographic information system
Greenprint	Bay Area Greenprint
Habitat Agency	Santa Clara Valley Habitat Agency
Habitat Plan	Santa Clara Valley Habitat Plan
HCP	habitat conservation plan
HCP/NCCP	Habitat Conservation Plan and Natural Community Conservation Plan
HCPs	habitat conservation plans
HUC	hydrologic unit code
I-280	Interstate 280
MCA	mitigation credit agreement
MTC	Metropolitan Transportation Commission
NCCP	natural community conservation plan
NHD	National Hydrography Dataset
NWI	National Wetlands Inventory
OSP	Open Space Preserve
Pajaro Study	The Natural Conservancy's Pajaro Study 2012-2013
PG&E	Pacific Gas & Electric
Program Guidelines	Regional Conservation Investment Strategies Program Guidelines
project section	San Jose to Merced Project Section
PV	Photovoltaic
RAMP	Regional Advance Mitigation Planning

RCIS	regional conservation investment strategy
REC	Road Ecology Center
Report	Coyote Valley Landscape Linkages Report
SCVHP	Santa Clara Valley Habitat Conservation
SCVWD	Santa Clara Valley Water District
SGCN	Species of Greatest Conservation Need
SR	California State Route
SSURGO	Soil Survey Geographic
Study	Coyote Valley Linkage Assessment Study
SWAP	State Wildlife Action plan
U.S. 101	U.S. Highway 101
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VTA	Santa Clara Valley Transportation Authority

Chapter 1
Introduction

1.1 Background

In 2016 the California State Legislature worked with the California Department of Fish and Wildlife (CDFW) to find creative ways to guide voluntary conservation actions and habitat enhancement actions for the state's most vulnerable species and their habitats. This collaboration resulted in Assembly Bill 2087, which outlines a program for informing science-based nonbinding and voluntary conservation actions and habitat enhancement actions that would advance the conservation of focal species, natural communities, and other conservation elements at a regional scale, including actions to address the impacts of climate change and other pressures and stressors that influence the resiliency of those species. Through its passage, Assembly Bill 2087 amended the California Fish and Game Code (CFGC), Division 2, Chapter 9, to add Sections 1850–1861, which create a regional conservation investment strategy program.

The program allows for CDFW or any public agency to develop a *regional conservation investment strategy* (RCIS) to guide voluntary conservation actions and habitat enhancement actions for a suite of species and natural communities. A *conservation action* is an action identified in an RCIS that, when implemented, would permanently protect or restore and permanently manage conservation elements, including species addressed by the RCIS (i.e., *focal species*) and their habitats. A *habitat enhancement action* is an action identified in an RCIS that, when implemented, would improve the quality of wildlife habitat. A habitat enhancement action would have long-term durability but would not involve acquiring land or permanently protecting habitat. The RCIS must include specific information about conservation actions necessary to adequately reduce pressures and stressors on those species, including identifying conservation priorities within the region, where appropriate. An RCIS identifies *conservation priorities* for implementation of important conservation actions and habitat enhancement actions by public agencies, conservation organizations, or private entities. An approved RCIS may also be used by entities requiring compensatory mitigation to facilitate selection of appropriate mitigation actions and mitigation sites.

To support and guide development of RCISs, CDFW released the *Regional Conservation Investment Strategies Program Guidelines* (Program Guidelines) (California Department of Fish and Wildlife 2017) in April 2017. These Program Guidelines were updated in June 2017 and again in February and September 2018 (California Department of Fish and Wildlife 2018). The Santa Clara County RCIS was developed consistent with CFGC 1850–1861, as well as the June 2017 Program Guidelines.

As allowed by the September 2018 Program Guidelines, this Santa Clara County RCIS is exempt from requirements in the September 2018 Program Guidelines and is subject to the June 2017 Program Guidelines because this RCIS was initiated prior to January 1, 2017 (Section 1.4, *Public Outreach and Involvement*). The September 2018 Program Guidelines clarifies RCIS requirements described in the June 2017 Program Guidelines, particularly requirements that affect RCIS implementation (Chapter 4, *Implementation*). This Santa Clara County RCIS references the September 2018 Program Guidelines where the September 2018 Program Guidelines was used to inform this RCIS.

A key component of the Program Guidelines is Section 2, *Standard Terminology*, which contains a detailed list of terms, abbreviations, and definitions applicable to RCISs. Appendix A, *Glossary*, integrates the terms from the September 2018 Program Guidelines to be consistent with current RCIS terminology and includes additional terms and abbreviations specific to this Santa Clara County RCIS.

Adoption of this RCIS by CDFW is consistent with CFGC 1850(e) and 1852(c)(7). By authorizing CDFW to approve RCISs, it is not the intent of the California State Legislature to regulate the use of land, establish land use designations, or to affect, limit, or restrict the land use authority of any public agency. Nothing in this RCIS is intended to, nor shall it be interpreted to, conflict with controlling federal, state, or local law, including CFGC 1850-1861, or any Guidelines adopted by the Department of Fish and Wildlife pursuant to Section 1858. Therefore, actions carried out as a result of this RCIS will be in compliance with all applicable state and local requirements.

In addition, this Santa Clara County RCIS does not conflict with the following requirements of CFGC 1855(b)).

1. Modify in any way the standards for issuance of incidental take permits or consistency determinations pursuant to Section 2081 or 2080.1, issuance of take authorizations pursuant to Section 2835, the issuance of lake or streambed alteration agreements pursuant to Section 1602, or any other provision of this code or regulations adopted pursuant to this code.
2. Modify in any way the standards under the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code), or in any way limit a lead agency's or responsible agency's discretion, in connection with any determination of whether a proposed project may or may not result in significant environmental effects or in any way establish a presumption in connection with any determination of whether a proposed project may or may not result in significant environmental effects or whether a proposed project's impacts would be mitigated.
3. Prohibit or authorize any project or project impacts.
4. Create a presumption or guarantee that any proposed project will be approved or permitted, or that any proposed impact will be authorized, by any state or local agency.
5. Create a presumption that any proposed project will be disapproved or prohibited, or that any proposed impact will be prohibited, by any state or local agency.
6. Alter or affect, or create additional requirements for, the general plan of the city, county, or city and county, in which it is located.
7. Constitute any of the following, for the purposes of the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code).
    a. A plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.
    b. A local policy or ordinance protecting biological resources.
    c. An adopted local, regional, or state habitat conservation plan.

Once an RCIS is approved by CDFW, an applicant may prepare a *mitigation credit agreement* (MCA) and request its approval by CDFW. An MCA identifies the type and number of credits a person or entity proposes to create by implementing one or more conservation actions or habitat enhancement actions, as well as the terms and conditions under which those credits may be used. MCAs enable *advance mitigation*, which is compensatory mitigation for estimated impacts on ecological resources (species and their habitat) and other natural resources that contributes to the fulfillment of regional conservation priorities and that is implemented prior to impacts occurring. A person or entity, including a state or local agency, private entity, or nongovernmental organization, can enter into an MCA with CDFW (California Department of Fish and Wildlife 2018).

CFGC 1856(c)(1)-(3) describes how MCA credits can be used, as follows.

> A mitigation credit created in accordance with this section may be used to fulfill, in whole or in part, compensatory mitigation requirements established under any state or federal environmental law, as determined by the applicable local, state, or federal regulatory agency, including, but not limited to, the following:
>
> 1. To compensate for take or other adverse impacts of activities authorized pursuant to Chapter 1.5 (commencing with Section 2050) of Division 3 within the regional conservation investment strategy area.
> 2. To reduce adverse impacts to fish or wildlife resources, or both, from activities authorized pursuant to Chapter 6 (commencing with Section 1600) within the regional conservation investment strategy area to less than substantial.
> 3. To mitigate significant effects on the environment within the regional conservation investment strategy area pursuant to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) and Guidelines for Implementation of the California Environmental Quality Act (Chapter 3 (commencing with Section 15000) of Division 6 of Title 14 of the California Code of Regulations).

1.2 Purpose and Need for RCIS

CFGC 1852(b) states,

> The purpose of a regional conservation investment strategy shall be to inform science-based nonbinding and voluntary conservation actions and habitat enhancement actions that would advance the conservation of focal species, including the ecological processes, natural communities, and habitat connectivity upon which those focal species and other native species depend, and to provide nonbinding voluntary guidance for one or more of the following.
>
> 4. Identification of wildlife and habitat conservation priorities, including actions to address the impacts of climate change and other wildlife stressors.
> 5. Investments in resource conservation.
> 6. Infrastructure.
> 7. Identification of areas for compensatory mitigation for impacts to species and natural resources.

This Santa Clara County RCIS was selected as a pilot RCIS in part because of the substantial available scientific data to support development of a robust RCIS in a relatively short amount of time. It is also expected that a number of transportation projects will be designed and proposed for construction in the next 3 to 10 years, and that not all of these projects will have their species mitigation needs met by the *Santa Clara Valley Habitat Plan* (Habitat Plan) (ICF International 2012), a *Habitat Conservation Plan* and *Natural Community Conservation Plan* (HCP/NCCP) approved in 2013 by the

U.S. Fish and Wildlife Service (USFWS) and CDFW. Certain projects may not be able to use the Habitat Plan for compensatory mitigation either because the activities are not covered by the Habitat Plan or because they are not within the Habitat Plan's permit area. Furthermore, the initial focus on transportation projects aligned with ongoing efforts by the Metropolitan Transportation Commission (MTC), the California State Coastal Conservancy (Coastal Conservancy), and The Nature Conservancy to establish a regional advance mitigation planning (RAMP) program in the San Francisco Bay Area (Bay Area). These efforts are discussed in Section 1.2.1, *Regional Advance Mitigation Planning*. Details regarding how this Santa Clara County RCIS will interact with the Habitat Plan and the approvals necessary by the Habitat Agency (the implementing entity for the Habitat Plan) for the execution of mitigation inside of the Habitat Plan's plan area are described in Chapter 4, Section 4.4.2.2, *Mitigation Credit Agreements and the Santa Clara Valley Habitat Plan*.

While mitigation for transportation projects was a key influencing factor in selecting this pilot project, this Santa Clara County RCIS can also support the mitigation needs of other types of projects occurring in the RCIS area (Section 1.3.2, *RCIS Area*), including ongoing development in the 15 cities addressed by this Santa Clara County RCIS (outside the Habitat Plan's plan area), installation or replacement of large-scale utilities, and replacement of aging stormwater management facilities. The pressures and stressors associated with development and infrastructure improvements are discussed in Chapter 2, *Environmental Setting.*

Additionally, this Santa Clara County RCIS can support regional conservation investments by informing where organizations, such as land trusts, can focus acquisition, restoration, or enhancement where it will have the largest benefit for focal species and other conservation elements. This RCIS also provides information on the different organizations that are active in the RCIS area, with the intent that agencies or organizations using this RCIS will consider sharing information beyond that contained in this RCIS or partnering in implementation of conservation actions and conservation investments.

1.2.1 Regional Advance Mitigation Planning

Transportation and natural resource agencies are collaborating to develop an innovative way to advance transportation infrastructure efficiently in the Bay Area while providing more effective conservation of natural resources and working lands through a RAMP process.

RAMP is a strategic mitigation approach that allows for natural resources (e.g., species, aquatic resources, and natural communities) to be protected or restored as compensatory mitigation for estimated impacts before infrastructure projects are constructed, often years in advance. Drawing on regional examples (such as the San Diego Association of Government's TransNet's Environmental Mitigation Program), RAMP was developed by a statewide group of federal and state infrastructure and natural resource agencies interested in integrated infrastructure and conservation planning that seeks to protect biological diversity while accommodating growth. While integrated infrastructure and conservation planning often leads to avoidance and reduced impacts on natural communities and ecosystems, sometimes impacts are unavoidable and must be compensated. The goals of RAMP are improved regional mitigation and conservation planning, improved mitigation and conservation effectiveness, and improved efficiency for infrastructure projects and conservation outcomes.

RAMP enables regional and local representatives from both infrastructure and natural resource agencies to jointly evaluate potential environmental impacts from infrastructure projects proposed for a region, and at the same time ensure that planned mitigation for those impacts contributes to regional conservation priorities. The advance time frame allows strategic mitigation to be implemented and made functional before infrastructure projects' unavoidable impacts occur. Mitigating in advance for a suite of projects allows for more efficient project approvals, adds certainty to cost estimates, and takes advantage of conservation opportunities before important land is lost to conversion.

RAMP is an approach that is consistent with federal and state policies encouraging landscape-scale and watershed-scale mitigation. The Federal Highway Administration's Eco-Logical Approach outlines the process and benefits of implementing transportation projects incorporating ecological principles. Federal mitigation guidance and rules emphasize landscape-scale mitigation (U.S. Department of Interior) and watershed-scale mitigation (U.S. Army Corps of Engineers [Corps] and U.S. Environmental Protection Agency [USEPA]).

RAMP is another step in the evolution to support integrated infrastructure and conservation planning and address the limitations of project-by-project mitigation. Other comprehensive, regional, and longer-term mitigation tools include HCPs and NCCPs, which take a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity. An HCP/NCCP provides for regional or area wide protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity through a regulatory process with permit coverage from USFWS and/or CDFW, typically for 30 to 50 years. By contrast, RAMP focuses on integrated conservation and infrastructure planning to provide effective compensatory mitigation but does not result in incidental take permits from USFWS or CDFW.

RAMP is expected to be implemented on the regional scale. In 2014, the MTC and the Coastal Conservancy launched an effort to develop a RAMP initiative in the San Francisco Bay Area. MTC and the Coastal Conservancy are sponsoring Bay Area RAMP, which has been included as a strategy in the region's transportation plan, called Plan Bay Area 2040. Working with state and federal resource agencies and county transportation agencies, MTC and the California Department of Transportation, the initiative is integrating an assessment of predicted compensatory mitigation needs from planned transportation projects with an assessment of Bay Area conservation priorities, relying on existing conservation plans and data sources, and developing a RAMP framework for the region. A draft RAMP planning document was prepared in 2017 (State of California Coastal Conservancy and Metropolitan Transportation Commission 2018).

RAMP is intended to advance project approvals and permits more efficiently and effectively with more certainty by addressing mitigation needs in advance, grounded by regional conservation priorities. This Santa Clara County RCIS intends to facilitate this process by identifying priority areas for conservation at a finer scale (focusing on focal species and natural communities) and providing a framework for crediting conservation actions, including habitat protection and enhancement, through MCAs.

In November 2016, the voters of Santa Clara County passed Santa Clara Valley Transportation Authority's (VTA's) Measure B, a measure to fund transportation improvements. Measure B institutes a half-cent sales tax increase for 30 years, which will generate more than $6 billion for road and transit improvements. Many of these improvements will occur within the built environment of cities or on existing roads, and therefore will have no impact on threatened or endangered species or other natural resources. Of those improvement projects with species or natural resource impacts, many will be covered by and mitigated through the Habitat Plan. A subset of transportation improvement projects funded by Measure B and other funding sources will not be covered by the Habitat Plan. Projects that are not covered by the Habitat Plan because they are outside the Habitat Plan permit area or are exempt from the provisions of the Plan could benefit from this RCIS, which identifies priority conservation actions that can be used for mitigation.

The Santa Clara County "subregional assessment" for RAMP includes a more detailed assessment of opportunities to link local planned transportation projects included in Measure B with appropriate mitigation projects. It will be designed to identify a portfolio of high-quality conservation projects that can be implemented through one or more MCAs with CDFW; in doing so, it will demonstrate the benefits of the RCIS process.

1.3 RCIS Overview

This Santa Clara County RCIS presents conservation goals and objectives for the RCIS area (Chapter 3, *Conservation Strategy*). Incorporated into those goals and objectives are conservation priorities for land acquisition, restoration, and enhancement. These conservation priorities are intended to be used in multiple ways. First, conservation organizations can use these priorities to inform the work they do, ensuring that their efforts align with the goals in this RCIS. This alignment includes the pursuit of funding for land acquisition, restoration, and enhancement. Second, the conservation priorities presented in this RCIS can also inform project permitting and regulatory processes by providing project proponents, regulatory agencies, and agencies with local land use authority information to identify priority conservation actions that can be used to meet project mitigation needs. Guidance on how this RCIS can be used to support various state and federal permits that typically require mitigation can be found in Appendix B, *Regulatory Processes*.

This Santa Clara County RCIS was developed to complement other key planning efforts that overlap in the RCIS area. Primarily, it builds on existing efforts to develop a RAMP (Section 1.2.1, *Regional Advance Mitigation Planning*) for the Bay Area with a focus on transportation projects. This RCIS was also developed to be consistent and coordinated with the Habitat Plan, addressing projects, species, and geographic locations that are not covered by that plan and including conservation actions that complement the Habitat Plan's conservation strategy. A discussion about the coordination with the Habitat Plan and the approvals necessary by the Habitat Agency for the execution of mitigation inside of the Habitat Plan's permit area are described in Chapter 4, *Implementation*, Section 4.4.2.2, *Mitigation Credit Agreements and the Santa Clara Valley Habitat Plan*.

1.3.1 RCIS Development Team

The Santa Clara County RCIS development process began in March 2016. The process was initiated by the Santa Clara Valley Open Space Authority (Authority), in collaboration with VTA, and The Nature Conservancy. ICF was the lead technical consultant on the RCIS document, working under the direction of the Authority and its consultant team, VTA, The Nature Conservancy, and the Santa Clara Valley Habitat Agency (the implementing entity for the Habitat Plan) (referred to as the Steering Committee). Funding for RCIS development was provided by the Stephen D. Bechtel, Jr. Foundation and the Coastal Conservancy.

This Santa Clara County RCIS was also developed in close coordination with other local conservation organizations and regulatory agencies, as well as representatives from the pilot East Bay RCIS (which is adjacent to the RCIS area) and the Bay Area RAMP Technical Advisory Committee. This coordination is described in more detail below.

1.3.1.1 RCIS Proponent

The Authority is the *RCIS proponent*, the public agency proposing this strategy and will submit it to CDFW for approval. The role of the RCIS applicant is described further in Chapter 4, *Implementation*.

The Authority is an independent special district whose mission is to conserve the natural environment, support agriculture, and connect people to nature by protecting open spaces, natural areas, and working farms and ranches for future generations. The Authority was created by the California State Legislature in 1993 at the urging of community leaders who saw the importance of maintaining the ecological integrity of the region. Its jurisdiction is all of Santa Clara County with the exception of lands and communities within the boundaries of the Midpeninsula Regional Open Space District and the City of Gilroy. The cities of Milpitas, Santa Clara, Campbell, San José , and Morgan Hill all fall within the Authority's jurisdiction. The Authority also has the ability to acquire and hold lands outside of its jurisdiction. The Authority currently owns and/or manages over 15,000 acres of open space.

The Authority's major preservation tools include buying land, acquiring easements, contributing funds to joint conservation efforts, and careful land management. To help guide the implementation of these tools, the Authority prepared a greenprint for regional conservation (Santa Clara Valley Open Space Authority 2014). The *Santa Clara Valley Greenprint* establishes conservation goals for protecting wildlands, conserving water resources, sustaining agricultural lands, and providing recreational and educational opportunities. The Authority collaborated with the Stephen D. Bechtel, Jr. Foundation and other agencies in preparation of this RCIS to both support the intended outcomes of Assembly Bill 2087 in Santa Clara County, and to support implementation of the strategies in the *Santa Clara Valley Greenprint*. Section 1.4, *Public Outreach and Involvement* provides more details on the many partners with whom the Authority collaborated in the development of the Santa Clara County RCIS.

1.3.1.2 Steering Committee

The coordination and development of the Santa Clara County RCIS was guided by a *Steering Committee*. The Steering Committee, led by the Authority, was composed of staff from the Authority, Santa Clara Valley Habitat Agency, The Nature Conservancy, VTA, and the Coastal Conservancy. The Steering Committee met monthly during most months from March 2016 through mid-2018 to provide guidance on the development of this RCIS, including the identification of the RCIS area and focal species; the development of conservation goals, objectives, and priorities; and the development of the implementation structure. The Steering Committee also coordinated outreach to stakeholders.

1.3.1.3 Technical Subcommittee

The Steering Committee formed a subgroup, the Technical Subcommittee, to analyze key technical and conservation planning issues and make recommendations to the Steering Committee. The Technical Subcommittee was composed of conservation specialists who met on an as-needed basis.

1.3.1.4 Bay Area RAMP Technical Advisory Committee

Because this Santa Clara County RCIS was developed to guide advance mitigation and facilitate MCAs (Chapter 4, *Implementation*), the Bay Area RAMP Technical Advisory Committee was involved in the RCIS planning process. The committee provided feedback to the Steering Committee and consultants on technical issues and draft elements of the RCIS.

1.3.1.5 Conservation Partners and Infrastructure Agencies

The Steering Committee established a working group of Conservation Partners early in the RCIS development process. The Conservation Partners working group was formed through outreach to anticipated future users of this Santa Clara County RCIS, including conservation organizations, resource agencies, and public infrastructure agencies. The goals of the outreach were to obtain data and input necessary to ensure that this RCIS will be effective and to increase capacity and support for its long-term implementation. Meetings with these organizations are summarized in Section 1.4, *Public Outreach and Involvement*, and a list of Conservation Partners members is provided in Appendix C, *Public Outreach*.

1.3.1.6 State Agency Sponsor

As a key state agency partner on both this Santa Clara County RCIS and the East Bay RCIS development teams, the Coastal Conservancy is also acting as the RCIS state agency sponsor for this Santa Clara County RCIS. As the Santa Clara County RCIS's state agency sponsor, the Coastal Conservancy requested approval of this RCIS through a state agency sponsor letter sent to the Director of Fish and Wildlife, as required by CFGC 1852(a). The letter summarizes the purpose of this Santa Clara County RCIS from both a conservation perspective and an infrastructure planning perspective. The letter is included in Appendix D, *Letters of Support*.

1.3.2 RCIS Area

A key first step in developing this Santa Clara County RCIS was to define the *RCIS area* that would be addressed by measures in this RCIS. To develop and define the RCIS area, the Technical Subcommittee evaluated alternative RCIS areas and provided recommendations to the Steering Committee. Alternative RCIS areas were developed considering the following types of data in and adjacent to the RCIS area.

- Important topographic or hydrologic boundaries such as watersheds (e.g., the U.S. Geological Survey's standard database of watershed boundaries).
- Areas where conservation may occur that will contribute to species recovery or sustain populations of focal species.
- Existing protected areas.
- Natural community or ecoregional boundaries.
- Jurisdictional boundaries or areas of conservation interest to the Authority, including the Authority's jurisdiction and VTA's jurisdiction.
- Boundaries of approved or in-process conservation plans or open space strategies, including the *Santa Clara Valley Greenprint* and the approved Habitat Plan.
- Locations of key projects or activities expected to use this RCIS.
- Areas of core habitat or recovery units for one or more focal species.
- Projected development based on current local general plans or capital improvement plans.

The RCIS area comprises all of Santa Clara County, encompassing 834,559 acres (Figure 1-1). The strategy area includes most of the areas of conservation interest to the Authority and VTA's U.S.

Improvement Project between Monterey Street and State Route 129 and the State Route 152 Trade Corridor Project within Santa Clara County.

The geographic area of this Santa Clara County RCIS extends beyond the Habitat Plan boundaries (Section 1.5, *Relevant Plans and Policies*). To build upon the conservation strategy in the Habitat Plan, this RCIS incorporates many Habitat Plan conservation actions into RCIS conservation actions and habitat enhancement actions and prioritizes protection of species' habitat covered by the Habitat Plan in the RCIS area beyond the Habitat Plan boundary.

Initially, the Steering Committee selected an RCIS area comprised of Santa Clara County plus portions of three HUC-10 watersheds[1] in the upper region of the Pajaro River watershed in northern San Benito County. The portion of the RCIS area extending into San Benito County was included in the Public Draft Santa Clara County RCIS (December 2017) but was removed from the RCIS area for this Final Draft in response to written comments from County of San Benito, Board of Supervisors provided to the Authority on March 20, 2018 during the public review period and subsequent meetings with representatives of San Benito County (Section 1.4, *Public Outreach and Involvement*). The Steering Committee initially included a small portion of northern San Benito County in the RCIS area to include VTA's projects in this area. The Steering Committee also included this part of San Benito County in the RCIS area because it includes almost all of the Central California Coast Ecoregion and all of the Soap Lake Floodplain, which straddles the Santa Clara – San Benito County boundary. This area of San Benito County has been identified as a major conservation priority in the collaborative *Pajaro Compass* (2016) effort and is the location of a number of planned transportation infrastructure projects that will require mitigation for impacts on listed species and their habitat, floodplain values, farmland, and connectivity.

1.3.3 Focal Species

Focal species are species whose conservation needs are addressed through this RCIS. Chapter 2, *Environmental Setting*, describes all focal species for this Santa Clara County RCIS, along with the process used to select focal species for this RCIS. Conservation priorities, including land protection, enhancement, and restoration, are described in the context of their importance for contributing to the conservation and recovery of focal species and their habitats, as well as for other conservation elements in this RCIS area (Chapter 3, *Conservation Strategy*). Some species that were not selected as focal species for this Santa Clara County RCIS (i.e., *non-focal species*; See Chapter 2, Section 2.2.6, *Non-focal Species*) have conservation needs similar to the focal species and may also be addressed through this RCIS's conservation strategy. It is assumed that MCAs that memorialize protection and improvements for habitats that support focal and non-focal species alike and are consistent with this RCIS's conservation goals and objectives could result in mitigation credits for both focal and non-focal species.

1.3.4 Strategy Term

After finding that the RCIS meets the requirements of CFGC 1852, CDFW may approve an RCIS for an initial period of up to 10 years from the date of approval. CDFW may extend the duration of an approved or amended RCIS for additional periods of up to 10 years after updating the RCIS with new

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[1] For the purpose of this RCIS, major watersheds are identified at the level of the U.S. Geological Survey's 10-digit Hydrologic Unit Code (HUC 10).

scientific information and a new finding that the RCIS continues to meet the requirements of Section 1852.

1.3.5 RCIS Requirements

To approve this Santa Clara County RCIS, CDFW must determine that it meets all of the requirements in the CFGC and the RCIS Program Guidelines for an RCIS. To assist CDFW with this determination, Table 1-1 lists the requirements as they appear in CFGC. The corresponding element in this RCIS is noted.

Table 1-1. Checklist of Fish and Game Code Required Elements in an RCIS

California Fish and Game Code	Required Element	Relevant RCIS Section(s)
1852(a)	The department may approve a regional conservation investment strategy pursuant to this chapter. A regional conservation investment strategy may be proposed by the department or any other public agency, and shall be developed in consultation with local agencies that have land use authority within the geographic area of the regional conservation investment strategy. The department may only approve a regional conservation investment strategy if one or more state agencies request approval of the regional conservation investment strategy through a letter sent to the director indicating that the proposed regional conservation investment strategy would contribute to meeting both of the following state goals: (1) Conservation. (2) Public infrastructure or forest management.	Section 1.3.1.6, *State Agency Sponsor*
1852(c)(1)	An explanation of the conservation purpose of and need for the strategy.	Section 1.2, *Purpose and Need for RCIS*
1852(c)(2)	The geographic area of the strategy and rationale for the selection of the area, together with a description of the surrounding ecoregions and any adjacent protected habitat areas or linkages that provide relevant context for the development of the strategy.	Section 1.5, *Relevant Plans and Policies* Section 2.2.1, *Protected Areas* Section 2.2.2, *Ecoregions* Section 2.3.1, *Habitat Connectivity*
1852(c)(3)	The focal species included in, and their current known or estimated status within, the strategy.	Section 2.2.5, *Focal Species*

California Fish and Game Code	Required Element	Relevant RCIS Section(s)
1852(c)(4)	Important resource conservation elements within the RCIS area, including, but not limited to, important ecological resources and processes, natural communities, habitat, habitat connectivity, and existing protected areas, and an explanation of the criteria, data, and methods used to identify those important conservation elements.	Section 2.2.1, *Protected Areas* Section 2.2.2, *Ecoregions* Section 2.2.3, *Watersheds* Section 2.2.4, *Natural Communities and Land Cover* Section 2.2.5, *Focal Species* Section 2.3, *Other Conservation Elements* Section 2.3.1, *Habitat Connectivity*
1852(c)(5)	A summary of historic, current, and projected future stressors and pressures in the RCIS area, including climate change vulnerability, on the focal species, habitat, and other natural resources, as identified in the best available scientific information, including, but not limited to, the State Wildlife Action Plan.	Section 2.4, *Pressures and Stressors on Focal Species and other Conservation Elements*
1852(c)(6)	Consideration of major water, transportation and transmission infrastructure facilities, urban development areas, and city, county, and city and county general plan designations that accounts for reasonably foreseeable development of major infrastructure facilities, including, but not limited to, renewable energy and housing in the RCIS area.	Section 1.5, *Relevant Plans and Policies* Section 2.1, *Built Environment*
1852(c)(7)	Provisions ensuring that the strategy will be in compliance with all applicable state and local requirements and does not preempt the authority of local agencies to implement infrastructure and urban development in local general plans.	Section 1.3, *RCIS Overview* Section 3.8, *Consistency with Approved Conservation Strategies and Recovery Plans*
1852(c)(8)	Conservation goals and measurable objectives for the focal species and important conservation elements identified in the strategy that address or respond to the identified stressors and pressures on focal species.	Section 3.2.1, *Conservation Goals and Objectives* Section 3.6., *Conservation Strategy for Focal Species* Section 3.7, *Conservation Strategy for Other Conservation Elements*
1852(c)(9)	Conservation actions, including a description of the general amounts and types of habitat that, if preserved or restored and permanently protected, could achieve the conservation goals and objectives, and a description of how the conservation actions and habitat enhancement actions were prioritized and selected in relation to the conservation goals and objectives.	Section 3.2.2, *Actions and Priorities* Section 3.6, *Conservation Strategy for Focal Species* Section 3.7, *Conservation Strategy for Other Conservation Elements*

California Fish and Game Code	Required Element	Relevant RCIS Section(s)
1852(c)(10)	Provisions ensuring that the strategy is consistent with and complements any administrative draft natural community conservation plan, approved natural community conservation plan, or federal habitat conservation plan that overlaps with the RCIS area.	Section 1.5, *Relevant Plans and Policies* Section 3.8, *Consistency with Approved Conservation Strategies and Recovery Plans* Section 4.4.2.2, *Mitigation Credit Agreements and the Santa Clara Valley Habitat Plan*
1852(c)(11)	An explanation of whether and to what extent the strategy is consistent with any previously approved strategy or amended strategy, state or federal recovery plan, or other state or federal approved conservation strategy that overlaps with the RCIS area.	Section 1.5, *Relevant Plans and Policies* Section 3.8, *Consistency with Approved Conservation Strategies and Recovery Plans*
1852(c)(12)	A summary of mitigation banks and conservation banks approved by the department or the U.S. Fish and Wildlife Service that are located within the RCIS area or whose service area overlaps with the RCIS area.	Section 2.2.1.3 *Conservation and Mitigation Banks*
1852(c)(13)	A description of how the strategy's conservation goals and objectives provide for adaptation opportunities against the effects of climate change for the strategy's focal species.	Section 3.4, *Adaptations against the Effects of Climate Change*
1852(c)(14)	Incorporation and reliance on, and citation of, the best available scientific information regarding the RCIS area and the surrounding ecoregion, including a brief description of gaps in relevant scientific information, and use of standard or prevalent vegetation classifications and standard ecoregional classifications for terrestrial and aquatic data to enable and promote consistency among regional conservation investment strategies throughout California.	Section 2.2.2, *Ecoregions* Section 2.2.4, *Natural Communities and Land Cover* Section 3.3, *Conservation Gap Analysis and Conservation Targets* Section 4.2.1, *Updating this RCIS with Best Available Science*
1852(d)	A regional conservation investment strategy shall compile input and summary priority data in a consistent format that could be uploaded for interactive use in an Internet Web portal and that would allow stakeholders to generate queries of regional conservation values within the RCIS area.	Section 3.2.2, *Actions and Priorities*

California Fish and Game Code	Required Element	Relevant RCIS Section(s)
1852(e)	In addition to considering the potential to advance the conservation of focal species, regional conservation investment strategies shall consider all of the following: (1) The conservation benefits of preserving working lands for agricultural uses. (2) Reasonably foreseeable development of infrastructure facilities. (3) Reasonably foreseeable projects in the RCIS area, including, but not limited to, housing. (4) Reasonably foreseeable development for the production of renewable energy. (5) Draft natural community conservation plans within the area of the applicable regional conservation investment strategy.	Section 1.5.1, *Habitat Conservation Plans and Natural Community Conservation Plans* Section 2.1, *Built Environment* Section 2.3.2, *Working Landscapes* Section 3.8, *Consistency with Approved Conservation Strategies and Recovery Plans* Section 3.7.2, *Working Landscapes*
1854(a)	The department may prepare or approve a regional conservation investment strategy, or approve an amended strategy, for an initial period of up to 10 years after finding that the strategy meets the requirements of Section 1852.	Section 1.3.4, *Strategy Term* Section 4.7, *Extending and Amending the RCIS*
1854(c)(1)	A public agency shall publish notice of its intent to create a regional conservation investment strategy. This notice shall be filed with the Governor's Office of Planning and Research and the county clerk of each county in which the regional conservation investment strategy is found in part or in whole. If preparation of a regional conservation investment strategy was initiated before January 1, 2017, this notice shall not be required.	Not applicable, as this RCIS was initiated before January 1, 2017
1854(c)(3)(*A*)	A public agency proposing a strategy or amended strategy shall hold a public meeting to allow interested persons and entities to receive information about the draft regional conservation investment strategy or amended strategy early in the process of preparing it and to have an adequate opportunity to provide written and oral comments. The public meeting shall be held at a location within or near the strategy area.	Section 1.4, *Public Outreach and Involvement* Appendix C, *Public Outreach*
1854(c)(3)(*B*)	In a draft regional conservation investment strategy or amended strategy submitted to the department for approval, the public agency shall include responses to written public comments submitted during the public comment period.	Section 1.4, *Public Outreach and Involvement* Appendix C, *Public Outreach*
1854(c)(3)(*C*)	If preparation of a regional conservation investment strategy was initiated before January 1, 2017, and a public meeting regarding the strategy or amended strategy that is consistent with the requirements of this section was held before January 1, 2017, an additional public meeting shall not be required.	Section 1.4, *Public Outreach and Involvement* Appendix C, *Public Outreach*

California Fish and Game Code	Required Element	Relevant RCIS Section(s)
1854(c)(4)	At least 30 days before holding a public meeting to distribute information about the development of a draft regional conservation investment strategy or amended strategy, a public agency proposing a strategy shall provide notice of a regional conservation investment strategy or amended strategy public meeting as follows: (A) On the public agency's Internet Web site and any relevant LISTSERV. (B) To each city, county, and city and county within or adjacent to the regional conservation investment RCIS area. (C) To the implementing entity for each natural community conservation plan or federal regional habitat conservation plan that overlaps with the RCIS area. (D) To each public agency, organization, or individual who has filed a written request for the notice, including any agency, organization, or individual who has filed a written request to the department for notices of all regional conservation investment strategy public meetings.	Section 1.4, *Public Outreach and Involvement* Appendix C, *Public Outreach*
1854(c)(5)	At least 60 days before submitting a final regional conservation investment strategy or amended strategy to the department for approval, the public agency proposing the investment strategy or amended strategy shall notify the board of supervisors and the city councils in each county within the geographical scope of the strategy and provide the board of supervisors and the city councils with an opportunity to submit written comments for a period of at least 30 days.	Section 1.4, *Public Outreach and Involvement* Appendix C, *Public Outreach*
1854(e)	The department shall require the use of consistent metrics that incorporate both the area and quality of habitat and other natural resources in relation to a regional conservation investment strategy's conservation objectives to measure the net change resulting from the implementation of conservation actions and habitat enhancement actions.	Section 3.3, *Conservation Gap Analysis and Conservation Targets* Section 3.6, *Conservation Strategy for Focal Species* Section 3.7, *Conservation Strategy for Other Conservation Elements* Section 4.2.1, *Updating this RCIS with Best Available Science*

California Fish and Game Code	Required Element	Relevant RCIS Section(s)
1856(b)	For a conservation action or habitat enhancement action identified in a regional conservation investment strategy to be used to create mitigation credits pursuant to this section, the regional conservation investment strategy shall include, in addition to the requirements of Section 1852, all of the following: (1) An adaptive management and monitoring strategy for conserved habitat and other conserved natural resources. (2) A process for updating the scientific information used in the strategy, and for tracking the progress of, and evaluating the effectiveness of, conservation actions and habitat enhancement actions identified in the strategy, in offsetting identified threats to focal species and in achieving the strategy's biological goals and objectives, at least once every 10 years, until all mitigation credits are used. (3) Identification of a public or private entity that will be responsible for the updates and evaluation required pursuant to paragraph (2).	Section 3.9, *Adaptive Management and Monitoring Strategy* Section 4.2, *Required RCIS Implementation Activities to Create MCAs* Section 4.2.1, *Updating this RCIS with Best Available Science*

Notes:

HCP = Habitat Conservation Plan; NCCP = Natural Community Conservation Plan; RCIS = Regional Conservation Investment Strategy

1.4 Public Outreach and Involvement

Public outreach is required by CFGC 1854 (Table 1-1) and has been an important part of the process of developing this RCIS. The Steering Committee led the public outreach and involvement process for this RCIS to ensure that CFGC public meeting requirements are met, and to engage potential users of the RCIS throughout the RCIS development process.

The requirements for public outreach prior to the approval of an RCIS, as described in CFGC 1854, are presented in Table 1-1, and summarized here, along with a description of how the Steering Committee met these requirements.

CFGC 1854(c)(1) requires a public agency to publish notice of its intent to create an RCIS. If preparation of the RCIS was initiated before January 1, 2017, however, this notice is not required. Because development of the Santa Clara County RCIS began in March 2016, a notice of intent to create an RCIS was not published.

CFGC 1854(c)(3)(*A*) requires that the public agency preparing an RCIS (in the case of this RCIS, the Authority) hold a public meeting to allow interested persons and entities to receive information about the RCIS early in the preparation process and to have adequate opportunity to provide written and oral comments. As required in CFGC 1854(c)(4), at least 30 days before holding the public meeting, the Steering Committee provided notice of the development of the draft Santa Clara County RCIS on the Authority's website; to each city, county, and city and county within and adjacent to the RCIS area; and to the Habitat Plan's implementing agency (the Habitat Agency). No public agency, organization, or individual filed a written request for the notice, so no additional notices were sent. Consistent with this requirement, a public meeting was held on December 8, 2016 at Santa Clara Valley Open Space Authority offices in San José , California. Notice of this meeting was posted in the San José Mercury News and on the Open Space Authority's website and was sent directly to subscribers of the agency's Board meeting packet. Interested persons were invited to provide oral and written comments to the Authority. The public meeting was held as part of a regularly scheduled Board of Directors meeting.

Public meeting requirements differ depending on when preparation of the RCIS was initiated (CFGC 1854(c)(3)(*C*)). If preparation of an RCIS was initiated before January 1, 2017, and a public meeting that was consistent with the requirements of CFGC 1854 was held before January 1, 2017, an additional public meeting shall not be required. For this RCIS, which was initiated before January 1, 2017, an additional public meeting was not required, as the public meeting held on December 8, 2016, was consistent with CFGC 1854.

CFGC 1854(c)(5) requires that at least 60 days before submitting a final RCIS to CDFW for its review and approval, the RCIS applicant (i.e., the Authority) shall notify the board of supervisors and the city councils in each county within the RCIS area and provide the board of supervisors and the city councils an opportunity to submit written comments for at least 30 days. On January 19, 2018, the Authority notified the board of supervisors and the city councils in each county within the RCIS area and invited the board of supervisors and city councils to submit written comments on the Santa Clara County RCIS.

CFGC 1854(c)(3)(*B*) requires that in a draft RCIS submitted to CDFW for approval, the public agency shall include responses to written public comments submitted during the public comment period. The Steering Committee included responses to written public comments in the Final Santa Clara County RCIS submitted to CDFW in Appendix C, *Public Outreach*.

Table 1-2 provides a brief description of the notices provided and meetings held during the public outreach involvement and meeting process.

In addition to outreach and engagement of conservation partners, regulatory agencies, and infrastructure agencies, the Steering Committee provided outreach and briefings for environmental, agricultural, and business organizations, and local governments, including counties and cities in the RCIS area. As part of this process, the Steering Committee held two conservation partner meetings, with the following goals.

1. Provide conservation partners in the region with information on this RCIS and RAMP planning efforts.
2. Invite partner input regarding draft ecological values, conservation priorities, and actions.

These conservation partner meetings and other outreach efforts are summarized in Table 1-2. Participants involved in the public outreach process are listed in Appendix C, *Public Outreach*.

Table 1-2. Public Outreach and Involvement Meeting Summary

Date	Public Outreach and Involvement
August 3, 2016	Partner Meeting #1. Hosted by the Authority, the Steering Committee provided conservation partners in the region information about RAMP and the RCIS.
October 4, 2016	The Authority met with Council of San Benito Governments, San Benito County Resource Manager, and Cal Trans District 5 staff.

Date	Public Outreach and Involvement
October 26, 2016	The Authority met with various community groups and leaders working in the northern portion of San Benito County and involved with the Pajaro Compass.
November 7, 2016	The Authority provided notice of the RCIS public meeting on the Authority's website to each city and county within and adjacent to the RCIS area, and to the Santa Clara Valley Habitat Agency.
December 8, 2016	The Authority held a public meeting in San José as part of its Board of Directors meeting to discuss preparation of the RCIS. Interested persons and entities were invited to provide oral comments during the meeting and submit written comments to the Authority. No written comments were submitted to the Authority during or in the 60 days after the public meeting.
December 22, 2016	The Authority provided information on this Santa Clara County RCIS to the Santa Clara Valley Habitat Agency Technical Advisory Committee.
January 17, 2017	The Authority provide information on this Santa Clara County RCIS at the Joint Board Meeting of the Authority and the Santa Clara Valley Water District.
February 1, 2017	The Authority met with the County of Santa Clara planning department to provide information on this Santa Clara County RCIS.
February 2, 2017	The Authority met with the Peninsula Working Group, comprised of regional environmental organizations, and hosted by the Committee for Green Foothills.
February 14, 2017	Partner Meeting #2. Held through a Webinar, the Steering Committee provided updates on this Santa Clara County RCIS development and requested feedback on conservation opportunities in the RCIS Area.
March 1, 2017	The Authority met with the Silicon Valley Leadership Group to provide information on this Santa Clara County RCIS.
March 3, 2017	The Authority met with the Santa Clara Farm Bureau to provide information on this Santa Clara County RCIS.
July 12, 2017	The Administrative Draft Santa Clara County RCIS was submitted to CDFW.
August 11, 2017	CDFW informed the Authority that the Administrative Draft Santa Clara County RCIS was incomplete. In a letter to the Authority, CDFW provided a list of items required by CFGC 1850-1861 and the Program Guidelines that must be added to the RCIS for CDFW to deem the RCIS complete.
December 15, 2017	The 2nd Administrative Draft Santa Clara County RCIS was submitted to CDFW.
January 12, 2018	CDFW deemed this Santa Clara County RCIS complete.
January 19, 2018	The Authority sent a notification about the Santa Clara County RCIS to the Santa Clara County and San Benito County Boards of Supervisors and the city councils within the RCIS area more than 60 days prior to the final RCIS being submitted to CDFW for approval. In this notice, the Authority provided the boards of supervisors and city councils with an opportunity to submit written comments for a period of 60 days. Written comments, and responses to those comments, are included in Appendix C, *Public Outreach*.
January 22, 2018	Sixty-day public review period begins. CDFW posted the Public Draft Santa Clara County RCIS on its RCIS Program website and requested that comments be submitted in writing to CDFW or the Authority by March 22, 2018. Written public comments, and responses to those comments, are included in Appendix C, *Public Outreach*.

Date	Public Outreach and Involvement
February 16, 2018	The Authority met with two members of the San Benito County Board of Supervisors to discuss the benefits of including a portion of northern San Benito County in the RCIS area.
March 2, 2018	The Authority met with a member of the San Benito County Board of Supervisors to discuss the benefits of including a portion of northern San Benito County in the RCIS area.
March 6, 2018	The Authority gives a presentation to the San Benito County Board of Supervisors at their board meeting about the RCIS and to clarify that consistent with CFGC 1850(e), the RCIS does not regulate the use of land, establish land use designation, or affect, limit, or restrict the land use authority of any public agency.
March 21, 2018	CDFW extended the public review period to April 12, 2018.
April 12, 2018	Public review period ends.
October 16, 2018	The Authority met with a representative of the San Benito County Council of Governments.
November 13, 2018	The Authority met with members of the San Benito County Board of Supervisors, San Benito County Planning, San Benito County Executive's Office, San Benito County Counsel, and the San Benito County Council of Governments to discuss the Authority's responses to San Benito County Board of Supervisors' comments.
April 2, 2019	The Authority participated in a conference call with representatives of San Benito County and CDFW to hear San Benito County's key concerns about the RCIS, discuss how the RCIS could benefit San Benito County, and evaluate inclusion of a portion of San Benito County in the RCIS area.
April 16, 2019	County of San Benito Board of Supervisors submits a letter to the Authority and CDFW requesting that San Benito County be removed from the RCIS area.
May 1, 2019	The Authority elects to remove San Benito County from the RCIS area at the request of the County of San Benito Board of Supervisors.

Notes:

CDFW = California Department of Fish and Wildlife; CFGC = California Fish and Game Code; RCIS = Regional Conservation Investment Strategy

1.5 Relevant Plans and Policies

This section identifies the federal recovery plans and other state and federal approved conservation strategies that overlap the RCIS area. There are no previously approved RCISs in this RCIS area. As required in CFGC 1852(c)(10), this Santa Clara County RCIS had been developed to be consistent with all existing conservation plans—including but not limited to the Habitat Plan—and to complement those plans wherever possible. Furthermore, as required by the Program Guidelines, this RCIS's conservation purpose aligns with the goals and objectives of the State Wildlife Action Plan (California Department of Fish and Wildlife 2015), and any approved regional conservation assessment encompassing the RCIS area. The conservation goals and objectives for this RCIS (Chapter 3, *Conservation Strategy*) align with many of the Statewide, Bay Delta, and Central Coast Province goals in the State Wildlife Action Plan, and, if implemented, would help to achieve them.

1.5.1 Habitat Conservation Plans and Natural Community Conservation Plans

Table 1-3 provides a list of HCPs and HCP/NCCPs in the RCIS area, including the date approved, plan area size, and species covered. Regional conservation plans and strategies within and adjacent to the RCIS area are shown in Figure 1-2.[2]

Table 1-3. Habitat Conservation Plans and Natural Community Conservation Plans Overlapping the RCIS Area

HCPs and HCP/NCCPs	Year Approved	Plan Area Size (Acres)	Species Covered
Pacific Gas and Electric's San Francisco Bay Area Operations and Maintenance HCP	2017	402,440	California freshwater shrimp, Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, Delta green ground beetle, bay checkerspot butterfly, callippe silverspot butterfly, Lange's metalmark butterfly, mission blue butterfly, San Bruno elfin butterfly, California tiger salamander, California red-legged frog, Alameda whipsanke, San Francisco garter snake, Ridgway's rail, salt marsh harvest mouse, San Joaquin kit fox, pallid manzanita, Sonoma sunshine, coyote ceanothus, fountain thistle, Santa Clara Valley dudleya, Contra Costa wallflower, Marin dwarf flax, Burke's goldfields, Contra Costa goldfields, Sebastopol meadowfoam, Antioch Dunes evening primrose, white-rayed pentachaeta, and Metcalf Canyon jewelflower
Donald Von Raesfeld Power Plant Low-Effect HCP	2014	9,926	Bay checkerspot butterfly, coyote ceanothus, Santa Clara Valley dudleya, Metcalf Canyon jewelflower, Tiburon paintbrush
Santa Clara Valley HCP/NCCP	2013	508,669	Bay checkerspot butterfly, California tiger salamander, California red-legged frog, foothill yellow-legged frog, western pond turtle, western burrowing owl, least Bell's vireo, tricolored blackbird, San Joaquin kit fox, Tiburon Indian paintbrush, coyote ceanothus, Mount Hamilton thistle, Santa Clara Valley dudleya, fragrant fritillary, Loma Prieta hoita, smooth lessingia, Metcalf Canyon jewelflower, most beautiful jewelflower
Stanford University HCP	2013	8,000	California tiger salamander, California red-legged frog, San Francisco garter snake
Los Esteros Low Effect HCP	2011	9,926	Bay checkerspot butterfly, coyote ceanothus, Santa Clara Valley dudleya, Metcalf Canyon jewelflower, Tiburon paintbrush

[2] Smaller HCPs (<10,000 acres) are not shown in Figure 1-2. The Pacific Gas and Electric's San Francisco Bay Area Operations and Maintenance HCP is not shown in Figure 1-2 because the HCP's plan area covers PG&E facilities located in the nine Bay Area counties (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma).

HCPs and HCP/NCCPs	Year Approved	Plan Area Size (Acres)	Species Covered
PG&E Metcalf - El Patio, Metcalf - Hicks/Vasona Low Effect HCP	2007	35.9	Bay checkerspot butterfly
PG&E Metcalf-Evendale/Monta-Vista HCP	1998	4.19	Bay checkerspot butterfly
Zanker Road Resource Management HCP	1999	0.83	Salt marsh harvest mouse
San Francisco Public Utilities Commission Alameda Watershed HCP	In development	47,800	California tiger salamander, California red-legged frog, foothill yellow-legged frog, tricolored blackbird, burrowing owl, callippe silverspot butterfly, Pacific Townsend's big-eared bat, western pond turtle, Alameda whipsnake, Pacific lamprey, California Central Coast steelhead, fall and late-fall run Central Valley Chinook salmon, Congdon's tarplant, Hospital Canyon larkspur, most beautiful jewelflower

Notes:
HCP = Habitat Conservation Plan; NCCP = Natural Community Conservation Plan

1.5.2 Recovery and Other Conservation Plans

Several state and federal recovery plans overlap the RCIS area and many state and local conservation plans address the RCIS area (Table 1-4).

Table 1-4. Recovery and Other Conservation Plans

Plan Type	Plan Name	Responsible Agency and Date Published	Incorporation into RCIS
Multispecies Recovery Plans	Coastal Multispecies Final Recovery Plan: California Coastal Chinook Salmon ESU, Northern California Steelhead DPS, and Central California Coast Steelhead DPS	National Marine Fisheries Service 2016	Central California Coast steelhead DPS is a focal species; recovery units used in habitat model.
	Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California	U.S. Fish and Wildlife Service 2013	Incorporated into the Summary of Baylands Conservation Strategy (Appendix I, *Summary of Bayland Conservation Strategies*).
	Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area	U.S. Fish and Wildlife Service 1998a	RCIS developed in close coordination with this program for serpentine soils and focal plant species on serpentine soils.
	Recovery Plan for Upland Species of the San Joaquin Valley, California.	U.S. Fish and Wildlife Service 1998b	Focal species; conservation actions included in prioritization.

Plan Type	Plan Name	Responsible Agency and Date Published	Incorporation into RCIS
Single Species Recovery Plans	Recovery Plan for Central California Distinct Population Segment of California Tiger Salamander	U.S. Fish and Wildlife Service 2017	Focal species; critical habitat included in prioritization.
	Recovery Plan for the South-Central Coast Steelhead Trout	National Marine Fisheries Service 2013	Focal species; critical habitat included in prioritization.
	Recovery Plan for Western Snowy Plover Pacific Coast Population	U.S. Fish and Wildlife Service 2007	Reviewed and incorporated, as applicable, in the baylands conservation strategy
	Recovery Plan for California Red-Legged Frog	U.S. Fish and Wildlife Service 2002	Focal species; critical habitat included in prioritization.
	Recovery Plan for California Least Tern	U.S. Fish and Wildlife Service 1985	Reviewed and incorporated, as applicable, in the baylands conservation strategy.
State-Wide or Regional Conservation Assessments	Regional Advanced Mitigation Program–Mitigation Assessment	Regional Advanced Mitigation Program (State of California Coastal Conservancy and Metropolitan Transportation Commission 2018)	RCIS developed in close coordination with this program.
	Audubon Important Bird Areas	Audubon 2016	
	State Wildlife Action Plan	California Department of Fish and Wildlife 2015	Included in focal species selection process.
	The Conservation Lands Network 1.0	Bay Area Open Space Council 2011	Land cover data incorporated.
	Fire Resource and Assessment Program	CalFire Fire Resource and Assessment Program 2015	Land cover data incorporated.
	Riparian Bird Conservation Plan	Riparian Habitat Joint Venture 2004	
Regional Conservation Strategies	Final Santa Clara Valley Habitat Conservation Plan	ICF International 2012	The Habitat Plan land cover dataset is used by this RCIS (Chapter 2, *Environmental Setting*); as such, it is a component of the species habitat models, descriptions of natural communities and land cover types, and the basis for developing the conservation strategy (Chapter 3, *Conservation Strategy*). The RCIS goals, objectives, conservation priorities, and actions are designed

Plan Type	Plan Name	Responsible Agency and Date Published	Incorporation into RCIS
			to complement the Habitat Plan and are incorporated into this RCIS.
	Pajaro Compass	Pajaro Compass 2016	RCIS area expanded to address this program and expand opportunities to further the goals of the Pajaro Compass.
	Santa Clara Valley Greenprint	Santa Clara Valley Open Space Authority 2014	Used in protected land assessment, gap analysis, and conservation strategy.
	Mid-Peninsula Open Space District Conservation Vision	Mid-Peninsula Open Space District 2014	Used in protected land assessment, gap analysis, and conservation strategy.
	San Francisco Bay Subtidal Habitat Goals Report	State Coastal Conservancy 2010	Incorporated into the Summary of Baylands Conservation Strategy (Appendix I, *Summary of Bayland Conservation Strategies*)
	Baylands Ecosystem Habitat Goals	Goals Project 1999 and 2015	Goals incorporated into conservation strategy.
Critical Habitat	California Red-Legged Frog	U.S. Fish and Wildlife Service 2010	Focal species; critical habitat included in prioritization.
	South-Central California Coast Steelhead	National Marine Fisheries Service 2005	Focal species; critical habitat included in prioritization.
	Central California Coast Steelhead	National Marine Fisheries Service 2005	Focal species; critical habitat included in prioritization.
	California Tiger Salamander (Central Coast DPS)	U.S. Fish and Wildlife Service 2005	Focal species; critical habitat included in prioritization.
Wildlife Linkage Analyses	Bay Area and Beyond: Critical Linkages	Penrod et al. 2013	Linkages included in prioritization.
	California Essential Habitat Connectivity Project	Spencer et al. 2010	Linkages included in prioritization.

Notes:
DPS = distinct population segment; ESU = evolutionarily significant unit; RCIS = Regional Conservation Investment Strategy;

1.5.3 General Plans

There are 15 cities in Santa Clara County that are inside the RCIS area. These include three cities that are permittees to the Habitat Plan (City of San José , City of Morgan Hill, and City of Gilroy). Santa Clara County and all of the cities therein have general plans that describe the extent of each city or county's jurisdictional boundaries. Those general plan boundaries and their implications for the conservation landscape are described in Chapter 2, *Environmental Setting*.

1.6 Document Organization

This Santa Clara County RCIS and supporting information is presented in the chapters and appendices listed below.

- **Chapter 1, Introduction.** Chapter 1 discusses the background, purpose of and need for this RCIS, the planning process, RCIS area, strategy term, public outreach and process, and relevant plans in the RCIS area.
- **Chapter 2, Environmental Setting.** Chapter 2 provides an assessment of major infrastructure, natural resources, including natural communities and focal species, other conservation elements, gaps in scientific information, and the pressures and stressors to focal species and other natural resources.
- **Chapter 3, Conservation Strategy.** Chapter 3 provides a conservation gap analysis, conservation strategies and priorities for focal species and other conservation elements, an adaptive management and monitoring strategy, and explains how this RCIS is consistent with approved conservation strategies and recovery plans.
- **Chapter 4, Implementation.** Chapter 4 discusses how this Santa Clara County RCIS will be implemented, including coordination with other resource agencies, development of MCAs, and planning for adaptive management.
- **Chapter 5, References.** Chapter 5 is a bibliography of printed references and personal communications cited in the text.
- **Chapter 6, List of Preparers and Reviewers.** Chapter 6 identifies the people and their affiliated institutions that contributed to the development of this Santa Clara County RCIS
- **Appendix A, Glossary**
- **Appendix B, Regulatory Processes**
- **Appendix C, Public Outreach**
- **Appendix D, Letters of Support**
- **Appendix E, Evaluation of Species for Inclusion as Focal Species**
- **Appendix F, Non-focal Species Summaries**
- **Appendix G, Comparison of RCIS Species Habitat Models and Habitat Plan Habitat Models**
- **Appendix H, Focal Species Habitat Models**
- **Appendix I, Summary of Baylands Conservation Strategies**

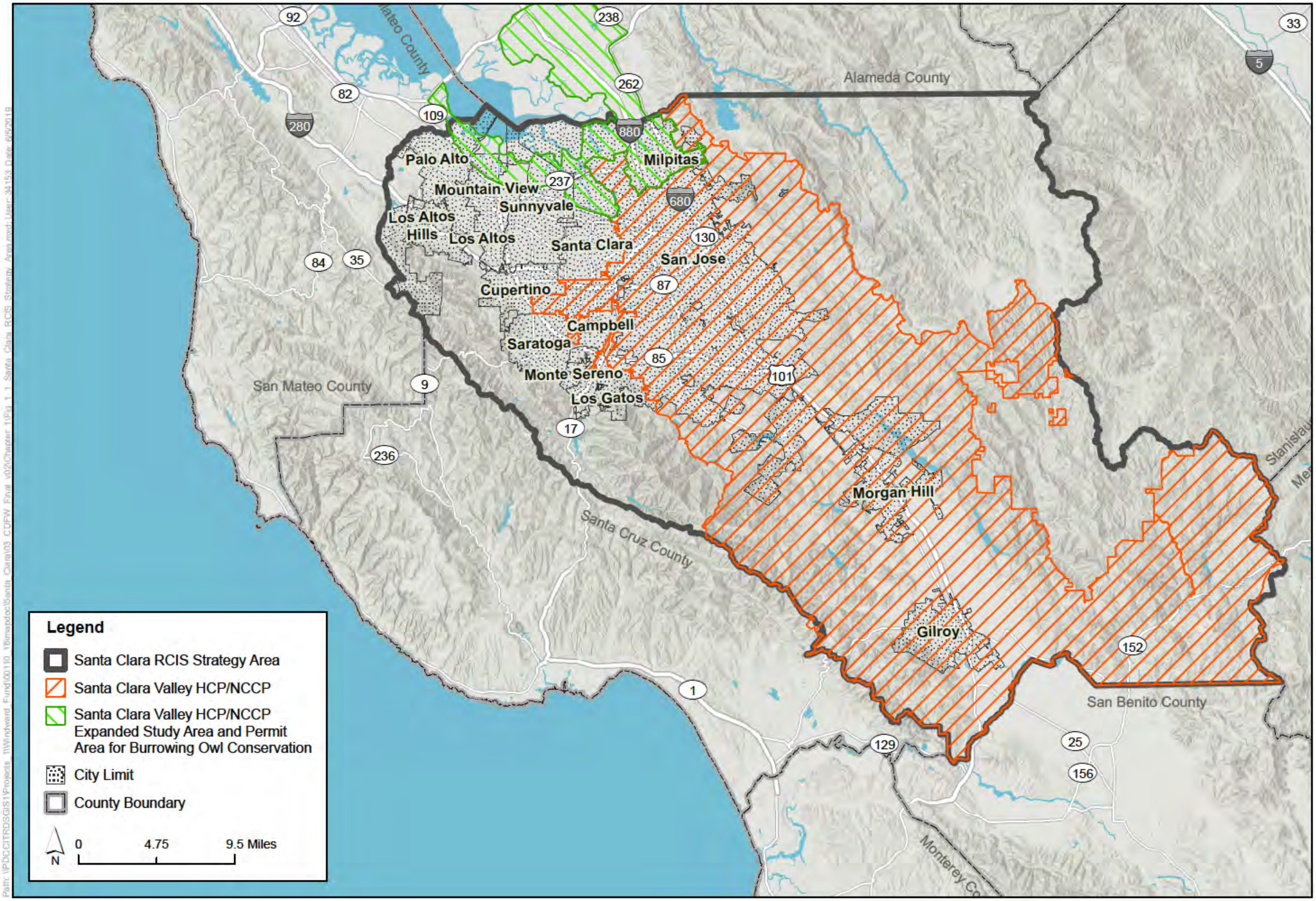

Figure 1-1
Santa Clara County RCIS Area

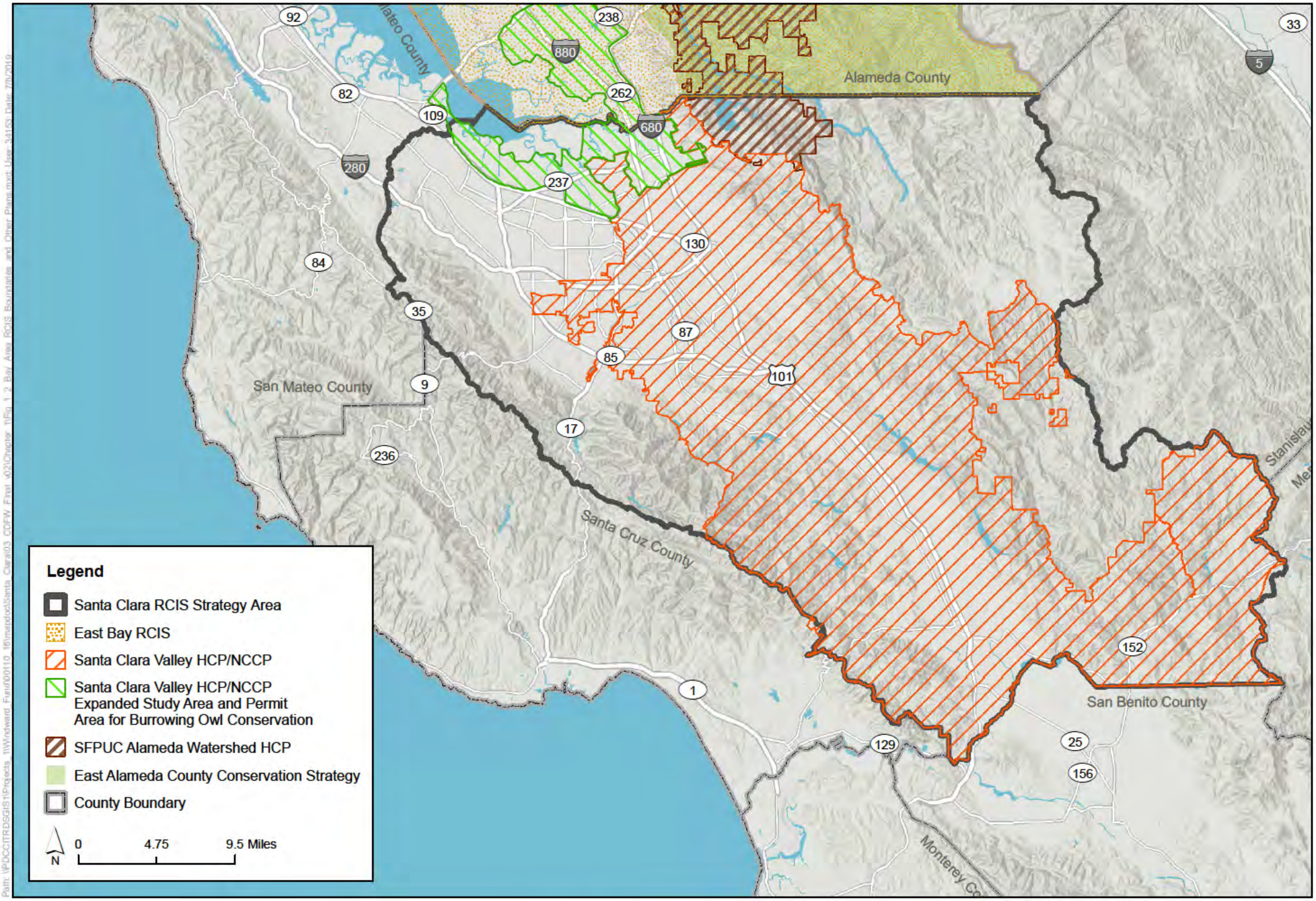

Figure 1-2
Regional Conservation Plans and Strategies within and Adjacent to the RCIS Area

Chapter 2
Environmental Setting

This chapter presents an overview of the natural resources and built environment in the RCIS area to provide context for this Santa Clara County RCIS's voluntary conservation and enhancement actions (Chapter 3, *Conservation Strategy*). This overview is comprised of the best available information on government planning boundaries, major infrastructure, and natural resources for the RCIS area relevant to the focal species and the RCIS's conservation goals and objectives. The built environment in the RCIS area is described in the context of the following subject areas, as required in the CFGC 1850.

- Reasonably foreseeable urban development.
- Major infrastructure, including water, transportation, and transmission infrastructure.

The environmental setting of the RCIS area is described for the following subject areas.

- Protected lands.
- Ecoregions.
- Watersheds.
- Natural communities, land cover types, and streams.
- Focal species.
- Non-focal species.

This chapter also describes other conservation elements that inform the conservation strategy, including the following.

- Habitat connectivity.
- Working landscapes.
- Unique land cover types.
- Serpentine soils.

Finally, this chapter addresses the following pressures and stressors on conservation elements and focal species.

- Housing and urban areas.
- Livestock, farming, and ranching.
- Climate change and its influence on sea-level rise, drought, and wildfire.
- Non-native species and disease.
- Loss of habitat connectivity (also known as habitat fragmentation).
- Disruption of natural fire disturbance regime.
- Dams and water management/use.
- Mining and quarrying.

- Airborne pollutants.
- Tourism and recreation.

2.1 Built Environment

This section describes the local government jurisdictions and plans, as well as the infrastructure in the RCIS area.

2.1.1 Local Government Planning Boundaries

CFGC 1852(c)(6) requires "consideration of . . . city and county general plan designations that accounts for reasonably foreseeable development of . . . housing in the RCIS area." This section describes urban development areas and city and county general plan designations that describe future urban development that is reasonably foreseeable.

2.1.1.1 RCIS Area Jurisdictions

The RCIS area includes all of Santa Clara County. Santa Clara County is 1,304 square miles (834,560 acres) and includes 15 incorporated cities. Nearly 92% of the population of Santa Clara County lives in its cities (Santa Clara County 2016).

2.1.1.2 Land Use Designations

Each city and county in the RCIS area is required by state law to develop and periodically update general plans that include land use designations that typically include uses for urban development at various densities, rural development, commercial development, institutional development, and open space. Table 2-1 and Figure 2-1 show the land use designations of Santa Clara County and the 15 cities in the RCIS area.

Table 2-1. Land Use Designations in the RCIS Area

City or Unincorporated County	Land Use Designations[a]
Santa Clara County (unincorporated)	Agriculture/Resource Extraction, Commercial, Education/Public/Semi-Public, Industrial, Mixed Use, Parks/Open Space, Residential, Water
Campbell	Commercial, Education/Public/Semi-Public, Industrial, Mixed Use, Residential
Cupertino	Commercial, Education/Public/Semi-Public, Industrial, Mixed Use, Parks/Open Space, Residential
Gilroy	Agricultural/Resource Extraction, Commercial, Education/Public/Semi-Public, Industrial, Parks/Open Space, Residential
Los Altos	Commercial, Education/Public, Industrial, Mixed Use, Parks/Open Space, Residential
Los Altos Hills	Education/Public/Semi-Public, Mixed Use, Parks/Open Space, Residential
Los Gatos	Agricultural/Resource Extraction, Commercial, Education/Public/Semi-Public, Industrial, Mixed Use, Parks/Open Space, Residential

City or Unincorporated County	Land Use Designations[a]
Milpitas	Commercial, Education/Public/Semi-Public, Industrial, Mixed Use, Parks/Open Space, Residential
Monte Sereno	Commercial, Parks/Open Space, Residential
Morgan Hill	Agricultural/Resource Extraction, Commercial, Education/Public/Semi-Public, Industrial, Mixed Use, Parks/Open Space, Residential
Mountain View	Commercial, Education/Public/Semi-Public, Industrial, Mixed Use, Parks/Open Space, Residential
Palo Alto	Commercial, Education/Public/Semi-Public, Industrial, Mixed Use, Parks/Open Space, Residential
San José	Agricultural/Resource extraction, Commercial, Education/Public/Semi-Public, Industrial, Mixed Use, Parks/Open Space, Water, Residential
Santa Clara	Commercial, Education/Public/Semi-Public, Industrial, Mixed Use, Parks/Open Space, Residential
Saratoga	Agricultural/Resource Extraction, Commercial, Education/Public/Semi-Public, Mixed Use, Parks/Open Space, Residential
Sunnyvale	Commercial, Education/Public/Semi-Public, Industrial, Mixed Use, Parks/Open Space, Residential

Notes:

[a] Association of Bay Area Governments 2006, Moore Iacofano Goltsman, Inc. 2005.

In 2006, the Association of Bay Area Governments (ABAG) undertook efforts to collect land use data from all the cities and counties under its jurisdiction (Association of Bay Area Governments 2006). It aggregated the data and grouped the many different land use designations into 14 simplified categories (Figure 2-1). The ABAG data is the most comprehensive and readily available land use dataset for the Bay Area.

The land use categories used in this Santa Clara County RCIS are listed below, along with a brief description of the type of development or other feature included under each category. These eight land use categories were aggregated from the 14 land used categories used by ABAG.

- **Agriculture/Resource Extraction.** This land use category includes agriculture of all types and scales, from smaller row-crop farming operations to larger facilities such as nurseries. For a few municipalities, it also includes managed open space and areas designated as ranchlands. This category also includes almost all rangelands (for cattle grazing) that are not otherwise assigned a "Parks/Open Space" land use designation.
- **Commercial.** This land use category includes facilities that serve commercial or retail businesses. Examples include business centers, neighborhood commercial centers, research and development facilities, office spaces, roadside services, transit centers, hotels, and community and regional shopping centers.
- **Education/Public/Semi-Public.** This land use designation applies to facilities related to public and private education including school district lands, as well as schools and college campuses. It also applies to public service facilities including wastewater treatment plants, parking lots, maintenance yards, utility infrastructure, and correctional facilities.

- **Industrial.** This land use category includes light and heavy industrial uses that typically support industrial production (manufacturing), storage (warehousing), distribution, and repair.
- **Mixed Use.** In Table 2-1, the land use "Mixed Use" is associated with one or more of the following "mixed use" categories assigned by ABAG.
    - Mixed Use
    - Mixed Use: Commercial & Industrial
    - Mixed Use: Other
    - Mixed Use: Residential & Commercial
    - Mixed Use: Residential & Industrial
    - Mixed Use: Residential & Parks/Open Space or Agriculture/Resource Extraction

  While the terminology varies by jurisdiction, the general term applies to areas that mix multiple land uses, often including a residential component. In the RCIS area, these uses include historic preservation neighborhoods, combined industrial/commercial uses, institutional lands that also provide some amount of open space or commercial use, transit-oriented development (residential mixed with commercial near a public transit station), and medium- to high-density housing complexes.
- **Other/Unknown.** This land use category includes areas of planned development and special planning areas which did not fit into the other land use categories or areas where land use data was not available.
- **Parks/Open Space.** This land use category includes undeveloped land, excluding most rangelands (cattle grazing) across broad landscape and within residential areas. Examples include state and county parks, city parks, golf courses, fallow fields, and grassy hillsides surrounding residential development.
- **Residential.** This land use category includes residential areas of all sizes including rural residential areas, mixed residential, and low- and high-density residential areas.

2.1.2 Plan Bay Area

Plan Bay Area 2040 (Metropolitan Transportation Commission 2017a) is a state-mandated, integrated long-range transportation and land use plan. As required by Senate Bill 375, all metropolitan regions in California must complete a Sustainable Communities Strategy as part of a Regional Transportation Plan. In the Bay Area, the Metropolitan Transportation Commission and the Association of Bay Area Governments are jointly responsible for developing and adapting the Sustainable Communities Strategy that integrates transportation, land use, and housing to meet greenhouse gas reduction targets set by the California Air Resource Board. The region adopted its previous plan – Plan Bay Area – in July 2013 (Metropolitan Transportation Commission 2013). Plan Bay Area 2040 is a limited and focused update that builds upon the original Plan Bay Area, but with updated planning assumptions that incorporated key economic, demographic and financial trends from the previous four years.

Plan Bay Area 2040 provides a roadmap for accommodating projected household and employment growth in the nine-county Bay Area by 2040, as well as a transportation investment strategy for the region. Plan Bay Area 2040 is relevant to this Santa Clara County RCIS because it provides insight into geographic areas where reasonably foreseeable urban development may occur. Furthermore, Plan Bay Area links regional transportation planning and funding with regional and local population growth and future land use, and as such, also provides some insight into major infrastructure development related to transportation (this issue is considered further in Section 2.1.3.2, *Transportation*). Plan Bay Area 2040 was based on local planning efforts; Santa Clara County and other San Francisco Bay Area cities and counties participated in its development. Plan Bay Area 2040 projects population growth, housing, and employment for the year 2040 under three scenarios, plus a "no project" alternative.[1] As projected for the three scenarios and no project alternative, by 2040 Santa Clara will make up a 20-52% share of total San Francisco Bay Area population growth, employment in Santa Clara will make up a 28-30% share of total San Francisco Bay Area employment growth, and there will be a housing increase of 137,000-442,000 units.

Plan Bay Area 2040 can be used to inform decision-making related to the challenges of future population growth in Santa Clara County; however, it is not intended to interfere with local land use authority and does not replace local general plans or community-specific plans. Plan Bay Area 2040 provides no regional authority over cities and counties to decide how and where land is developed or preserved. Local governments are encouraged to utilize Plan Bay Area 2040 as a tool to inform land use and development decisions in the San Francisco Bay Area.

2.1.3 Major Infrastructure

CFGC 1852(c)(6) requires that an RCIS includes "consideration of major water, transportation and transmission infrastructure facilities . . . that accounts for reasonably foreseeable development of major infrastructure facilities, including, but not limited to, renewable energy . . . in the RCIS area." This section describes existing and reasonably foreseeable development of major infrastructure facilities in the RCIS area, including major water, transportation, transmission facilities, and renewable energy projects.

2.1.3.1 Water

Major water infrastructure in the RCIS area including canals, engineered channels, reservoirs, artificial marshes, artificial water features, and flood control channels are shown in Figure 2-2. The Santa Clara Valley Water District (SCVWD), the major water district in the RCIS area, manages and operates a complex and integrated water supply and flood management infrastructure network that includes dams, reservoirs, canals, pipelines, pump stations, percolation ponds, treatment plants, and recycled water facilities. With a significant portion of the water infrastructure approaching 40 to 50 years of age, SCVWD is carrying out major capital improvement projects to ensure each facility functions as intended. Some of the major capital improvement projects include the following.

- Seismic retrofit of SCVWD dams.
- Dam instrumentation.
- Canal rehabilitation and repair.
- Flood protection and levee rehabilitation.

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[1] See Plan Bay Area 2040 for details about the three scenarios and the "no project" alternative, and projections for population growth, employment, and housing in Santa Clara County at: http://www.planbayarea.org/counties/focus-santa-clara-county

The water district manages approximately 800 miles of creeks in Santa Clara County. To provide flood protection to the county's growing community, the district builds flood protection projects and administers an asset management program for its flood protection infrastructure. Among the major flood protections completed in recent years are 20 miles of flood protection improvements on the lower and downtown Guadalupe River, which protect an estimated 95,000 people who live or work along the river in cities of San José and Santa Clara. Flood protection and other creek-related projects include the following.

- Lower Berryessa Creek Flood Protection.
- Upper Berryessa Creek Flood Risk Management.
- Coyote Creek Flood Protection.
- Cunningham Flood Detention Project.
- Lower Llagas Creek Capacity Restoration Project.
- Lower Penitencia Creek Improvements Project.
- Upper Penitencia Creek Project.
- San Francisquito Creek Flood Protection.
- Federal Flood Insurance Program.

2.1.3.2 Transportation

This section describes the transportation agencies in the RCIS area. Figure 2-3 shows major transportation infrastructure within the RCIS area, including airports, transit hubs, transit priority areas, Statewide Transportation Improvement Program capital improvement projects, state highways, passenger railways, and rail stations.

Transportation Planning and Operations

Transportation planning agencies develop comprehensive strategies for transportation at the state, regional, or local level, in coordination with diverse groups of stakeholders. The major transportation planning agency in the RCIS area is the Santa Clara Valley Transportation Authority (VTA). VTA is an independent special district that provides sustainable, accessible, community-focused transportation. VTA provides bus, light rail, and paratransit services, as well as participates as a funding partner in regional rail service including Caltrain, Capital Corridor, and the Altamont Corridor Express. As the county's congestion management agency, VTA is responsible for countywide transportation planning, including congestion management, design and construction of specific highway, pedestrian, and bicycle improvement projects, as well as promotion of transit-oriented development. VTA is planning the following major transportation projects in the RCIS area in approximately the next 10 years.

- Transit Projects
  - Capitol Expressway Light Rail Project.
  - Rapid 523 Project.
  - Santa Clara Pedestrian Undercrossing.

- Highway Projects
  - VTA Silicon Valley Express Lanes Program.
  - Interstate 280 (I-280)/Winchester Boulevard Interchange Improvements.
  - I-280/Wolfe Road Interchange.
  - Mathilda Avenue Improvements at State Route (SR) 237 and U.S. Highway 101 (U.S. 101).
  - U.S. 101/Zanker Road Interchange.
  - SR 85 to U.S. 101 Express Lanes Project.
  - U.S. 101/SR 25 Interchange.

California High-Speed Rail Authority

The California High-Speed Rail Authority is responsible for the development of a high-speed rail system between Sacramento and San Diego, totaling approximately 800 miles with up to 24 stations. The San José to Merced Project Section (project section) is part of the first phase of the California High-Speed Rail System that will provide an approximately 84-mile passenger rail link between the RCIS area and the Central Valley, with an estimated travel time of one hour between San José and Gilroy to Merced or Fresno. The project section generally follows the Caltrain corridor and Union Pacific Rail Road corridor through San José , U.S. 101 through Morgan Hill and Gilroy, SR 152 through Pacheco Pass, and Henry Miller Road to Carlucci Road, approximately 8 miles east of Los Banos in Merced County (California High-Speed Rail Authority 2016). A train station for the California High-Speed Rail is planned in or near downtown Gilroy.

2.1.3.3 Transmission

Transmission facilities lines in the RCIS area include those supporting distribution of natural gas and electricity. Figure 2-4 shows transmission facilities in the RCIS area including transmission lines and natural gas pipelines.

Pacific Gas & Electric (PG&E) owns and operates all of the gas and electric transmission lines in the RCIS area. The company provides natural gas and electric service to approximately 16 million people throughout a 70,000-square-mile service area in northern and central California.

PG&E's proposed substation and transmission line project, referred to as "South County Power Connect" will increase the capacity of southern Santa Clara County's electric system for at least 43,000 existing electric customers in Morgan Hill, Gilroy, and the surrounding communities. These upgrades will increase the redundancy of the transmission system serving the area and reduce local power outages due to transmission line disruptions. Maps of the project study area can be found at PG&E's South County Power Connect website.[2]

2.1.3.4 Renewable Energy

Renewable energy projects are currently limited in the RCIS area. There are no large-scale (i.e., commercial scale) renewable energy projects planned in the RCIS area. Instead, renewable energy

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[2] https://www.pge.com/en_US/safety/electrical-safety/safety-initiatives/south-county/details.page

projects tend to be at the scale of individual residences (e.g., residential solar) or approximately 10 acres or less. The following is a list of renewable energy projects planned in Santa Clara County.

- Santa Clara County Renewables for Revenue.
- Guadalupe Parkway Solar Photovoltaic (PV) Project.
- Hellyer County Park Solar PV Site.
- Malech Road Solar PV Site.
- Holden Ranch Solar PV Site.
- Reid Hillview Airport Solar PV Site.
- San Martin Airport Solar PV Site.

2.2 Natural Environment

2.2.1 Protected Areas

The RCIS area includes existing *protected areas*, which are public or private lands protected through legal or other effective means, where the primary intent of land management is to manage the land for open space use. Protected areas include large parks and open space areas that are managed primarily for their ecological functions and values. Protected areas may also include semi-developed areas such as recreational parks that maintain some ecological value.

2.2.1.1 Methods

A geographic information system (GIS) dataset of protected areas was compiled for this Santa Clara County RCIS to inform the development of the conservation strategy (Chapter 3, *Conservation Strategy*). This dataset is used to identify gaps in protection (e.g., of focal species' habitat, movement corridors, or other natural resources), develop conservation goals and objectives, and prioritize conservation opportunities.

Data from the following sources were used to compile a protected areas database for this Santa Clara County RCIS.

- California Protected Areas Database (CPAD) (California Protected Areas Database 2016).
- California Conservation Easement Database (CCED) (California Conservation Easement Database 2015).
- GIS data from the Santa Clara Valley Open Space Authority and the Midpeninsula Regional Open Space District for recently protected areas not yet included in CPAD or CCED.

The CPAD and CCED data were clipped to the RCIS area to create the protected areas GIS data layer. All protected areas in the CPAD that were owned by cities and under 100 acres were removed from the dataset. This was done to remove small city parks, golf courses, and other urban protected areas from the dataset, which often provide minimal ecological value and would likely be unimportant for the conservation strategy. In some cases, small urban parks and other protected areas protect streams and riparian areas, which provide important habitat for aquatic and terrestrial species. Where appropriate, the conservation strategy (Chapter 3, *Conservation Strategy*) identifies conservation actions and priorities to benefit steelhead, salmon, and other species in stream lengths in urban and non-urban areas, regardless of whether they pass through small urban parks not included in this Santa Clara County RCIS's protected areas dataset.

Mitigation and conservation banks located in the RCIS area or with service areas that overlap the RCIS area were identified from the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and U.S. Army Corps of Engineers (Corps) bank websites.[3]

2.2.1.2 Types of Protected Areas

Protected areas in the RCIS area vary according to the mechanisms that protect the land (e.g., fee title, conservation easement, agricultural easement) and the degree to which land is protected for its ecological values (e.g., land protected primarily for the conservation of natural resources; land protected for multiple uses, including conservation and recreation; or land protected primarily for recreation.). All types of protected areas were included in the dataset. The following types of protected areas in the RCIS area are included in the dataset.

- Mitigation/conservation banks.
- Lands with conservation easements.
- Local or regional parks.
- State or federal wilderness areas.
- State parks.
- Agricultural easements for livestock grazing, dryland farming, or cultivated agriculture.
- Undeveloped portions of land under ownership by a public agency.
- Public golf courses (i.e., private golf courses are not included because they are private).
- Developed neighborhood parks.

There are approximately 254,167 (30% of the RCIS area) acres of protected area in the RCIS area, comprised of land protected in fee title only (193,618 acres; 23% of the RCIS area), through conservation easement only (45,153 acres; 5% of the RCIS area), or both (15,396 acres; 2% of the RCIS area) (Figure 2-5). Collectively, these protected areas provide important habitat for focal species and public recreational opportunities. The largest landowners in the RCIS area are the State of California (approximately 70,000 acres) and Santa Clara County (approximately 70 ,000 acres). Publicly owned protected lands total approximately 204,387acres. The largest owners of conservation easements are The Nature Conservancy (43,970 acres) and Midpeninsula Regional Open Space District (3,588 acres).

[3] Up-to-date information on approved conservation and mitigation banks can be found at the following USFWS, CDFW, and Corps websites: https://www.fws.gov/sacramento/es/Conservation-Banking/Banks/In-Area/es_conse-bank-in-area.htm
https://www.wildlife.ca.gov/Conservation/Planning/Banking/Approved-Banks
http://www.spn.usace.army.mil/Missions/Regulatory/Mitigation-Banks/Approved-Banks-for-the-San-Francisco-Regulatory-Di/

2.2.1.3 Conservation and Mitigation Banks

CFGC 1852(b)(12) requires that an RCIS provide, "a summary of mitigation banks and conservation banks approved by the department or the United States Fish and Wildlife Service that are located within the strategy area or whose service area overlaps with the strategy area." The Program Guidelines (California Department of Fish and Wildlife 2017) further specify that the summary include banks approved by the Corps, as well as information on the types of credits available and where information can be found on the number of available credits.

Conservation banks and *mitigation banks* are areas of preserved, restored, enhanced, or constructed habitats (for example, wetlands) that are set aside for the express purpose of providing mitigation for project impacts on wetlands, threatened and endangered species, and other sensitive resources. CFGC 1797.5 defines terms associated with mitigation banking in California. In summary, a conservation or mitigation bank is privately or publicly owned land that is managed for its natural resource values, with an emphasis on the targeted resource (species or aquatic resources, respectively). Overseeing agencies typically require that the establishment of a mitigation bank include the restoration or creation of aquatic resources. Conservation banks may include restoration or creation projects, but they are more heavily focused on the protection and management of existing occupied habitats of the target species. In exchange for permanently protecting and managing the land—and in the case of mitigation banks, restoring or creating aquatic resources—the bank operator is allowed to sell credits to project proponents who need to satisfy legal requirements for compensating environmental impacts of development projects.[4]

There are three conservation banks and one mitigation bank with available credits whose service area overlaps the RCIS area (Figure 2-6).

- The **Ohlone West Conservation Bank** is located in Southern Alameda County and is contiguous with watershed lands owned by the San Francisco Public Utilities Commission and wilderness preserves of the East Bay Regional Park District. The Ohlone West Conservation Bank offers credits for the California tiger salamander and California red-legged frog focal species within the RCIS area, as well as offering credits for the Alameda whipsnake and Callippe silverspot butterfly.[5]
- **Ridge Top Ranch Wildlife Conservation Bank** is located in Solano County. The bank has USFWS credits available for California red-legged frog with a service area overlapping the RCIS area.[6]
- The **Sparling Ranch Conservation Bank** is located in southeastern Santa Clara County and northeastern San Benito County. The bank is owned by Southbay Conservation Resources LLC

[4] For additional information on banking see the following websites: https://www.wildlife.ca.gov/Conservation/Planning/Banking/Approved-Banks and www.fws.gov/sacramento/es/cons_bank.htm

[5] http://www.fclands.com/banks/ohlone-west-conservation-bank-2016

[6] http://www.solanoconservationcredits.com/

and offers credits for California tiger salamander and California red-legged frog within the RCIS area.[7]

- The **Pajaro River Mitigation Bank** is located in San Benito County in the RCIS area, with a service area that includes the RCIS area. The bank is owned by Wildlands and offers credits for jurisdictional wetlands and waters.[8]

2.2.1.4 Protected Areas Adjacent to the Strategy Area

There are many protected areas that are immediately adjacent to the RCIS area. These areas provide landscape connectivity between the RCIS area and protected habitats beyond the RCIS area (Figure 2-5). The north side of the RCIS area includes portions of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). The Refuge extends outside of the RCIS area into adjacent Alameda County, providing connectivity for baylands natural communities to the north. Further east along the northern border the San Francisco Public Utilities Commission's Alameda Watershed is a large watershed protected for drinking water. This protected area includes annual grassland, chaparral and coastal scrub natural communities extending to the north of the RCIS area in Alameda County. This is the northernmost portion of several connected protected areas that extend along the Diablo Range, well into the RCIS area. On the east side of the RCIS area, Henry W. Coe State Park straddles the border of the RCIS area with Stanislaus County. Over one-third of the park lies outside of the RCIS area in adjacent Stanislaus County. Most of that area is dedicated as the Orestimba Wilderness Area. The 87,000-acre park provides landscape connectivity between the RCIS area and the more rugged interior of the Diablo Range. Along the southern border of the RCIS area straddling the border of the RCIS area in San Benito County are protected areas in the Soap Lake basin, including an easement held by the San Benito Agricultural Trust and the Sparling Ranch Conservation Bank. Along the western boundary of the RCIS area are a series of protected areas in the Santa Cruz Mountains, extending from the Forest of Nisene Marks and the Soquel Demonstration Forest north along the RCIS area boundary to Windy Hill Open Space Preserve (OSP) in San Mateo County. In between, protected areas such as the Skyline Ridge OSP, Long Ridge OSP, and Castle Rock State Park provide connectivity between redwood and coastal scrub natural communities in the RCIS area and in Santa Cruz County, adjacent to the RCIS area.

2.2.2 Ecoregions

CFGC 1852(c)(2) states that an RCIS shall include ". . . a description of the surrounding ecoregions…. that provide relevant context for the development of the strategy." Furthermore, CFGC 1852(c)(14) states that an RCIS shall include "incorporation and reliance on, and citation of, the best available scientific information regarding the RCIS area and the surrounding ecoregion..." This section provides a description of the ecoregions that overlap and surround the RCIS area, according to the U.S. Department of Agriculture classification (McNab et al. 2007).

Ecoregions are areas of general similarity in ecosystems based on major terrain features such as a desert, plateau, valley, mountain range, or a combination thereof as defined by the U.S. Department of Agriculture. They provide a spatial framework for the research, assessment, management, and

[7] https://www.wildlife.ca.gov/conservation/planning/banking/approved-banks#r3 and https://www.fws.gov/sacramento/es/Conservation-Banking/Banks/In-Area/

[8] https://www.wildlandsinc.com/banks/pajaro-river-mitigation-bank-wetl/

monitoring of ecosystems and ecosystem components. Ecoregions can be effective units for setting regional conservation goals, as well as developing biological criteria and water quality standards.

Ecoregions are hierarchical and are identified based on patterns of biotic and abiotic phenomena, including geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. North America is divided into different ecological units from coarsest to finest: ecoregions (i.e., provinces), subregions (i.e., sections), landscapes, and land units. The RCIS areas overlaps with two ecoregions, and within each ecoregion there is one subregion that overlaps the RCIS area (Figure 2-7). The descriptions in the following sections are based on the descriptions provided by the United State Department of Agriculture (McNab et. al. 2007).

2.2.2.1 California Coastal Chaparral Forest and Shrub Province

The California Coastal Chaparral Forest and Shrub Province overlaps the western portion of the RCIS area (Figure 2-7). This province covers much of the California coast from San Francisco to Baja. The primary distinguishing characteristic of this ecoregion is its Mediterranean climate of hot, dry summers and cool, moist winters, and associated vegetative cover comprising primarily chaparral and woodlands. The landscape is composed of coastal plains and high hills. Large areas are ranchland and are grazed by domestic livestock. Relatively little land has been cultivated. The Central California Coast Section occurs within the California Coastal Chaparral Forest and Shrub Province in the RCIS area.

Central California Coast Section

The Central California Coast Section is comprised of low- to- moderate elevation ranges and valleys. Bedrock is sedimentary, granitic, and ultramafic formations. The vegetation is composed of a mixture of western hardwoods, chaparral, and California annual grassland lan d cover types.

2.2.2.2 California Coastal Range Open Woodland-Shrub-Coniferous Forest-Meadow Province

The California Coastal Range Open Woodland-Shrub-Coniferous Forest-Meadow Province overlaps the eastern portion of the RCIS area (Figure 2-7). This province covers much of California from San Francisco to Baja. The ecoregion has a Mediterranean climate of hot, dry summers and cool, moist winters, and most precipitation is rain. Associated vegetative cover is comprised of evergreen shrubland, with lesser areas of woodland, consisting of broadleaf species, some of which are drought-deciduous. The Central California Coast Ranges Section occurs within the California Coastal Range Open Woodland-Shrub-Coniferous Forest-Meadow Province in the RCIS area.

Central California Coast Ranges Section

The Central California Coast Ranges Section covers the eastern half of the RCIS area. The landscape is low-elevation parallel ranges. Rock formations are marine and non-marine sedimentary origins. The vegetation is composed of western hardwoods, annual grassland, and chaparral.

2.2.3 Watersheds

Fifteen major watersheds[9] that overlap with or occur completely within the RCIS area: San Francisco Bay, Agua Caliente Creek, Alameda Creek, Arroyo Mocho, Arroyo Valle, Arroyo Hondo, Lower Coyote Creek, Saratoga Creek, Guadalupe River, Upper Coyote Creek, Llagas Creek, Pacheco Creek, Uvas Creek, Pajaro River, and Tequisquita Slough (Figure 2-8). These watersheds catch precipitation and runoff from storm drains and carry the water north to San Francisco Bay or south to Monterey Bay. Table 2-2 summarizes the amount of and major streams within each HUC-10 watershed that overlaps with the RCIS area.

Table 2-2. HUC-10 Watersheds in RCIS Area

Watershed Name	Area of Entire Watershed (acres)	Area (acres) and percent of RCIS Area	Major Creeks in Watershed[a] (length in miles in the RCIS Area)
Agua Caliente Creek	40,728	761 (0.1%)	Scott Creek (2.6)
Alameda Creek	86,620	15,187 (1.8%)	Alameda Creek (12.4) Valpe Creek (2.3)
Arroyo Hondo	63,397	60,482 (7.2%)	Arroyo Hondo (9.4) Calaveras Creek (7.9) Isabel Creek (18.7) Smith Creek (13.9)
Arroyo Mocho	62,158	3,970 (0.5%)	Arroyo Mocho (4.0) Tarraville Creek (0.3)
Arroyo Valle	107,152	61,503 (7.4%)	Arroyo Bayo (8.9) Arroyo Valle (10.8) Colorado Creek (10.2) San Antonio Creek (15.5)
Guadalupe River	116,314	116,019 (13.9%)	Alamitos Creek (7.7) Guadalupe Creek (9.8) Guadalupe River (15.1) Los Gatos Creek (24.8)
Llagas Creek	54,113	54,113 (6.5%)	Little Llagas Creek (7.2) Llagas Creek (30.9) Santa Clara Conduit (20.2) West Branch Llagas Creek (7.0)
Lower Coyote Creek	95,379	95,379 (11.4%)	Berryessa Creek (9.8) Coyote Creek (32.0) Thompson Creek (14.1) Upper Penitencia Creek (11.7)
Pacheco Creek	107,426	98,129 (11.8%)	Mississippi Creek (9.2) North Fork Pacheco Creek (16.5) Pacheco Creek (10.1)

[9] For the purpose of this Santa Clara County RCIS, major watersheds are identified at the level of the U.S. Geological Survey's 10-digit Hydrologic Unit Code (HUC 10).

Watershed Name	Area of Entire Watershed (acres)	Area (acres) and percent of RCIS Area	Major Creeks in Watershed[a] (length in miles in the RCIS Area)
			South Fork Pacheco Creek (8.0)
Pajaro River	117,917	22,697 (2.7%)	Pajaro River (3.4) Pescadero Creek (5.0) San Ysidro Creek (5.6) Santa Clara Conduit (9.6)
San Francisco Bay	202,844[b]	18,392 (2.2%)	Adobe Creek (2.5) Alviso Slough (4.3) Coyote Creek (3.6) Guadalupe Slough (6.1)
Saratoga Creek	124,493	103,321 (12.4%)	Calabazas Creek (13.0) San Tomas Aquinas Creek (13.4) Saratoga Creek (18.2) Stevens Creek (21.1)
Tequisquita Slough	74,405	4,108 (0.5%)	Arroyo De Las Viboras (0.6) Sulfur Creek (2.6)
Upper Coyote Creek	124,575	124,567 (14.9%)	Coyote Creek (21.7) East Fork Coyote Creek (14.9) Middle Fork Coyote Creek (19.5) San Felipe Creek (14.5)
Uvas Creek	55,487	55,323 (6.6%)	Bodfish Creek (8.0) Little Arthur Creek (6.5) Tar Creek (8.3) Uvas Creek (24.3)
Total	**1,433,008**	**833,951[c]**	**---**

Notes:

[a] Includes up to four of the longest creeks in each watershed; this is not a comprehensive list of all creeks in each watershed.

[b] The amount of San Francisco Bay within Santa Clara County.

[c] The total does not equal 100% because the RCIS boundary includes trace amounts of nine additional watersheds.

2.2.4 Natural Communities and Land Cover

All RCISs are required to identify "important resource conservation elements within the RCIS area, including, but not limited to, important ecological resources and processes, natural communities, habitat, habitat connectivity, and existing protected areas, and an explanation of the criteria, data, and methods used to identify those important conservation elements."[10] This Santa Clara County RCIS uses a detailed GIS-based map of land cover types within the RCIS area to spatially characterize the distribution of natural communities and habitat.

A *land cover type* is defined as the dominant character of the land surface discernible from aerial photographs or other remotely sensed imagery, as determined by vegetation, water, or human uses. Land cover types are the most widely used units in conservation planning to analyze a variety of

[10] CFGC 1852 (c)(4).

landscape characteristics, including natural communities, wetlands and streams, species' habitat, ecosystem function, and biological diversity. Land cover is often a function of a variety of physical and biological factors such as plant and animal associations, soil type, topography, climate, and land uses.

The land cover dataset is an important tool for developing this Santa Clara County RCIS's conservation strategy (Chapter 3, *Conservation Strategy*). Amongst its many uses, the land cover data were used to model focal species' habitat, identify gaps in conservation of habitat and other natural resources, set measurable conservation goals and objectives, and identify conservation priorities to achieve the goals and objectives.

The land cover data are intended to be used only for planning purposes at the scale of the RCIS area. The use of these data by project proponents is voluntary. The land cover data impose no regulatory requirements. If used for site planning, the land cover data should be only used as a guide. All land cover (including wetland and bayland) should be verified in the field.

2.2.4.1 Methods and Data Sources

The Santa Clara County RCIS land cover dataset was assembled using the following existing land cover data.

- Detailed land cover mapping conducted in 2005 and 2006, based on aerial photos from 2000, 2003, and 2004 for the Santa Clara Valley Habitat Conservation Plan/Natural Communities Conservation Plan (Habitat Plan) in Santa Clara County (ICF International 2012).
- Land cover data compiled by the Conservation Lands Network (CLN) (Bay Area Open Space Council 2011) for the entire 9-County San Francisco Bay Area. The CLN land cover map is widely used throughout the Bay Area by open space and planning agencies.
- The Bay Area Aquatic Resource Inventory, version 2.0 (BAARI) Baylands (San Francisco Estuary Institute and Aquatic Science Center 2015a) and Wetlands (San Francisco Estuary Institute and Aquatic Science Center 2015b) datasets—detailed base maps of the San Francisco Bay Area's aquatic features, mapped by the San Francisco Estuary Institute from 2009 to 2015, based on aerial imagery and other data sources.
- National Wetlands Inventory (NWI) Version 2.0 (U.S. Fish and Wildlife Service 2016), delineating the areal extent of wetlands and surface waters.
- Serpentine soil map units from the Soil Survey Geographic (SSURGO) databases covering eastern Santa Clara County (U.S. Department of Agriculture 2016a) and western Santa Clara County (U.S. Department of Agriculture 2016b), which were used to identify and classify serpentine land cover types.

These datasets represent the best available information in the RCIS area in terms of mapping accuracy, resolution, and consistency within and outside the RCIS area.

The land cover dataset was assembled using a two-step approach, as described in the following two sections: first, the terrestrial land cover dataset was assembled, after which the wetland and bayland dataset was assembled and integrated into the terrestrial land cover dataset.

Terrestrial Land Cover

The land cover data from the Habitat Plan provides the foundation for the Santa Clara County RCIS land cover dataset and maintains consistency between the Habitat Plan and the RCIS. The Habitat Plan land cover data were used in its entirety. However, the Habitat Plan land cover data only covers the Habitat Plan's plan area, which is approximately 61% of the RCIS area. CLN land cover data were used for the remainder of the RCIS area not covered by the Habitat Plan's land cover data. Other land cover data were considered for use, such as the Midpeninsula Regional Open Space District's vegetation data (Midpeninsula Regional Open Space District 2007). The CLN data were used to be consistent with current, regional mapping used for regional conservation planning throughout the San Francisco Bay area.

To create a unified terrestrial land cover dataset for the RCIS, the land cover classifications from CLN were cross-walked to the Habitat Plan's classification by matching similar CLN land cover types, based on comparable species assemblages, to the Habitat Plan's land cover types (Table 2-3a). This table also crosswalks the RCIS land cover dataset with natural communities and habitats identified in CDFW's Natural Community List (California Department of Fish and Wildlife 2018a) and list of Sensitive Vegetation Communities (California Department of Fish and Wildlife 2018b), California Habitat Wildlife Relationships habitat types (Mayer and Laudenslayer 1988), the Habitat Plan (ICF International 2012), and Conservation Lands Network (Bay Area Open Space Council 2011).

Table 2-3a. Crosswalk of Santa Clara County RCIS Terrestrial Land Cover Types to other State and Local Classification Systems

Santa Clara County RCIS Land Cover Type	California Department of Fish and Wildlife Natural Communities List[a, b]	California Wildlife Habitat Relationships Habitat Type[c]	Santa Clara County HCP/NCCP Land Cover Type[d]	Conservation Lands Network Land Cover Type[e]
Grassland				
California annual grassland	Wild oats grassland semi-natural alliance	Annual grassland	California annual grassland	Coastal terrace prairie; hot grasslands; moderate grasslands; non-native/ornamental grass; warm grasslands
Serpentine grassland	California Annual and Perennial Grassland macrogroup	N/A	Serpentine bunchgrass grassland	Serpentine grassland
Serpentine rock outcrop	Wild onion - jewel-flower - dwarf flax serpentine barrens alliance	N/A	Serpentine rock outcrop/barren[2]	N/A
Barren/Rock	N/A	N/A	Barren; rock Outcrop	Barren/rock
Shrublands				
Northern mixed chaparral/chamise chaparral	California chaparral macrogroup	Mixed chaparral	Northern mixed chaparral/chamise chaparral	Chamise chaparral; mixed chaparral; mixed montane chaparral
Serpentine chaparral	California chaparral macrogroup	N/A	Mixed serpentine chaparral	Serpentine leather-oak chaparral; serpentine scrub
Northern coastal scrub/ Diablan sage scrub	Central and south Coastal Californian coastal sage scrub group	Coastal scrub	Northern coastal scrub/ Diablan sage scrub/ coyote brush scrub	Coastal scrub

Santa Clara County RCIS Land Cover Type	California Department of Fish and Wildlife Natural Communities List[a, b]	California Wildlife Habitat Relationships Habitat Type[c]	Santa Clara County HCP/NCCP Land Cover Type[d]	Conservation Lands Network Land Cover Type[e]
Woodland				
Blue oak woodland	Blue oak woodland alliance	Blue oak woodland	Blue oak woodland	Blue oak/foothill pine woodland
Valley oak forest/ woodland	Valley oak woodland alliance	Valley oak woodland	Valley oak woodland	Valley oak forest/woodland
Coast live oak forest and woodland	Coast live oak woodland alliance	Coastal oak woodland	Coast live oak forest and woodland	Coast live oak forest/woodland
Mixed oak woodland and forest	Mixed oak forest alliance	N/A	Mixed oak woodland and forest	N/A
Montane hardwoods	California bay forest alliance	Montane hardwood-conifer	N/A	California bay forest; montane hardwoods
Serpentine hardwoods	N/A	N/A	N/A	Serpentine hardwoods
Conifer Forest				
Douglas fir forest	Douglas fir forest alliance	Douglas fir	Mixed evergreen forest	Douglas fir forest
Serpentine conifer	N/A	N/A	N/A	Serpentine conifer
Coulter pine forest	Coulter pine woodland alliance	Valley-foothill hardwood-conifer	N/A	Coulter pine forest
Knobcone pine forest	Knobcone pine forest alliance	Closed-cone pine-cypress	Knobcone pine forest	Knobcone pine forest
Ponderosa pine woodland	Ponderosa pine forest alliance	Ponderosa pine	Ponderosa pine woodland	N/A
Redwood forest	Redwood Forest alliance	Redwood	Redwood forest	Redwood forest

Santa Clara County RCIS Land Cover Type	California Department of Fish and Wildlife Natural Communities List[a, b]	California Wildlife Habitat Relationships Habitat Type[c]	Santa Clara County HCP/NCCP Land Cover Type[d]	Conservation Lands Network Land Cover Type[e]
Riparian Woodland				
Central coast riparian forest	Southwestern North American riparian, flooded and swamp forest macrogroup	Valley-foothill riparian	Willow riparian forest and scrub	Central Coast riparian forests
Sycamore alluvial woodland	California sycamore woodland alliance	Valley-foothill riparian	Central California sycamore alluvial woodland; mixed riparian forest and woodland	Sycamore alluvial Woodland
Serpentine riparian	N/A	N/A	N/A	Serpentine riparian
Cultivated Agriculture				
Cultivated–undetermined	N/A	N/A	N/A	Cultivated
Developed agriculture	N/A	Urban–agriculture	Agriculture developed	N/A
Grain, row-crops, hay and pasture/disked/rice	N/A	Dryland grain crops/ croplands/irrigated grain crops/irrigated hayfield/irrigated row and field crops	Grain, row-crop, hay and pasture, disked	N/A
Orchard	N/A	Deciduous orchard/ evergreen orchard /orchard-vineyard	Orchard	N/A
Vineyard	N/A	Vineyard	Vineyard	N/A

Santa Clara County RCIS Land Cover Type	California Department of Fish and Wildlife Natural Communities List[a, b]	California Wildlife Habitat Relationships Habitat Type[c]	Santa Clara County HCP/NCCP Land Cover Type[d]	Conservation Lands Network Land Cover Type[e]
Urban				
Urban	N/A	Urban/residential–park	Urban-suburban/golf courses/urban parks/landfill/ornamental woodland	Urban non-native
Rural residential	N/A	Urban	Rural-residential	Rural residential
Ornamental woodland	Eucalyptus-tree-of heaven-black locust groves, semi-natural alliance	eucalyptus, urban	Ornamental woodland	Eucalyptus; non-native/ornamental conifer; non-native/ornamental hardwood; non-native ornamental conifer-hardwood mixture

Notes:

HCP = Habitat Conservation Plan; NCCP = Natural Community Conservation Plan; RCIS = regional conservation investment strategy.

N/A = The corresponding classification system does not have a similar land cover type that can be cross walked to the RCIS type.

[a] California Department of Fish and Wildlife (2018a).

[b] CDFW Natural Communities List complies with the National Vegetation Classification Standard (NVCS) (Federal Geographic Data Committee 2008). NVCS is a hierarchical classification consisting of eight levels. Table 2-3a includes three CDFW natural community levels: macrogroup, group, and alliance. Macrogroup is the broadest of the three and is defined by moderate sets of diagnostic plant species and growth forms that reflect biogeographic differences in composition. Groups are grouped into macrogroups. Groups are defined by relatively narrow sets of diagnostic plant species, broadly similar composition, and diagnostic growth forms that reflect biogeographic differences in composition. Alliances are grouped into groups. Alliances are the lowest, most granular of the three levels. Alliances are defined by diagnostic plant species and moderately similar composition that reflects regional to subregional environmental factors such as climate, hydrology and disturbance regimes (Federal Geographic Data Committee 2008).

[c] California Department of Fish and Wildlife (2018b).

[d] ICF International (2012).

[e] Bay Area Open Space Council (2011).

The minimum mapping unit ranged from 0.2 acres to 10 acres, depending on the land cover type and data source. Figure 2-9 depicts the source of land cover data used to map land cover in the RCIS area.

There were several idiosyncrasies when adapting the land cover types from different sources for this Santa Clara County RCIS. Serpentine rock outcrop and barren/rock were included in the grassland natural community for consistency with the Habitat Plan. In the CLN dataset, underlying vegetation types on parcels less than 10 acres are classified as rural residential. For the RCIS dataset, where CLN data were used, the rural residential classifications were removed and the original CLN vegetation types were restored. Rural residential was retained as a land cover type where it is included in the other data sources.

In addition, the SSURGO database was reviewed to identify soils in the RCIS area with a potential serpentine component (includes serpentine, ultrabasic, and alluvium derived from serpentine). These areas were overlaid onto the existing non-serpentine land cover types, and land cover types were reclassified into serpentine land cover types where the extent of serpentine soils in each GIS mapping unit was greater than or equal to 30% (Figure 2-10). This approach is consistent with the Habitat Plan's mapping of serpentine soils, which generally corresponds to a cut-off of 30% or greater of the soil map unit being serpentine. See Section 2.3.4, *Serpentine Soils*, for more details on serpentine soils in the RCIS area.

Wetland and Baylands Land Cover

Data from the following five sources were used to develop a wetland and baylands land cover layer that was integrated into the terrestrial land cover data.

- BAARI Wetlands Version 2.0
- BAARI Baylands Version 2.0
- Habitat Plan land cover
- NWI Version 2.0
- SSURGO

BAARI Wetlands data were used as the primary building block for the wetland and baylands land cover layer, due to its currency (published in 2015) and high-quality mapping standards. BAARI wetland types were cross-walked into the RCIS land cover types (Table 2-3b). Types including seeps or springs were overlaid with select SSURGO map units representing potential serpentine soils to identify serpentine seeps and springs. This cross-walked and modified BARRI data served as the foundation of the wetland land cover layer.

Additional datasets were needed to provide wetland data where not covered by the BAARI data. Wetland types were cross walked from the Habitat Plan's land cover dataset and added only in areas not already covered by BAARI Wetlands. Select riverine types from the NWI Version 2 data, which were already represented by a separate stream dataset represented as lines (Stream Layer, below), were removed to avoid duplication with the separate linear stream dataset. The remaining types were added in areas not already covered by BAARI wetlands or the Habitat Plan's land cover dataset. Types removed included select linear shaped palustrine and riverine features primarily mapped in the higher elevations in the RCIS area. The following types were removed.

- Palustrine Emergent (PEM)
- Palustrine Forested (PFO)
- Palustrine Scrub-Shrub (PS)
- Riverine Intermittent (R4)
- Riverine Upper Perennial (R3)
- Riverine Unknown Perennial (R5)

BAARI Baylands were added to the dataset to provide coverage in the baylands portion of the RCIS area. All BAARI Bayland types were added and cross-walked to RCIS land cover types. Overlapping wetlands from the above datasets were overwritten. The minimum mapping unit varies across the source datasets, the smallest being less than 0.025 acre for small features such as seeps and springs (BAARI wetlands) and 25 meters (82 feet) for minimum mapping length of non-tidal unnatural channels. This compilation of wetlands and baylands was then integrated into the terrestrial land cover dataset and overwrote overlapping terrestrial land cover. Table 2-4 summarizes the amount of each wetland and baylands land cover type in each watershed within the RCIS area.

Table 2-3b. Crosswalk of Santa Clara County RCIS Wetland and Bayland Land Cover Types to other State and Local Classification Systems

Santa Clara County RCIS Land Cover Type	California Department of Fish and Wildlife Natural Communities List[a, b, c]	BAARI Baylands Land Cover Type[d]	California Wildlife Habitat Relationships Habitat Type[e]	BAARI Wetlands Land Cover Type[f]	Santa Clara County HCP/ NCCP Land Cover Type[g]	National Wetland Inventory Land Cover Types[h]
Baylands						
Shallow bay	N/A	Shallow bay	Marine	Lacustrine	N/A	E1UBL, E2SBNh, E2SBNx, E2SMh, E2USNh
Tidal bay flat	N/A	Tidal bay flat	Estuarine	Lacustrine	N/A	N/A
Tidal unnatural	N/A	Lagoon perennial open water unnatural; tidal ditch; tidal engineered channel	Estuarine	Riverine	N/A	N/A
Tidal vegetation	Temperate Pacific tidal salt and brackish meadow group; Southwestern North American salt basin and high marsh group	Lagoon perennial vegetation unnatural; tidal marsh flat; tidal panne; tidal vegetation	Estuarine; freshwater emergent wetland; saline emergent wetland	Playa open water unnatural/ playa unvegetated flat unnatural/ playa vegetated unnatural	N/A	E2EM1N, E2EM1Nh
Wetland and Pond						
Perennial freshwater marsh	Hardstem and California bulrush alliance; American bulrush alliance	N/A	Freshwater emergent wetland	Depressional vegetated natural;	Coastal valley and	L2EM2Fh

Santa Clara County RCIS Land Cover Type	California Department of Fish and Wildlife Natural Communities List[a, b, c]	BAARI Baylands Land Cover Type[d]	California Wildlife Habitat Relationships Habitat Type[e]	BAARI Wetlands Land Cover Type[f]	Santa Clara County HCP/NCCP Land Cover Type[g]	National Wetland Inventory Land Cover Types[h]
				depressional vegetation unnatural; lacustrine vegetated unnatural	freshwater marsh	
Seasonal wetland	Californian warm temperate marsh/seep group; Californian mixed annual/perennial freshwater vernal pool/swale bottomland group	N/A	Wet meadow	Playa open water Unnatural; playa unvegetated flat unnatural; playa vegetated unnatural	Seasonal wetland	N/A
Seep or spring (non-serpentine)	Iris-leaf Rush Seeps alliance; common monkeyflower seeps alliance	N/A	N/A	Seep or spring natural; seeps or spring unnatural	N/A	N/A
Seep or spring (serpentine)	N/A	N/A	N/A	Seep or spring natural; seeps or spring unnatural	Serpentine seep	N/A
Pond	Cattail marshes alliance	N/A	Lacustrine	Depressional open water natural; depressional open water unnatural	Pond	PABF, PABFh, PABFx, PABH, PABHh, PABHx, PUBF, PUBFh, PUBFx, PUBH, PUBHh, PUBHx, PUBK, PUBKx, PUSA, PUSAh,

Santa Clara County RCIS Land Cover Type	California Department of Fish and Wildlife Natural Communities List[a, b, c]	BAARI Baylands Land Cover Type[d]	California Wildlife Habitat Relationships Habitat Type[e]	BAARI Wetlands Land Cover Type[f]	Santa Clara County HCP/ NCCP Land Cover Type[g]	National Wetland Inventory Land Cover Types[h]
						PUSAx, PUSC, PUSCh, PUSCx, PUSKx
Reservoir	N/A	N/A	Water	Lacustrine open water unnatural; lacustrine open water natural	Reservoir	L1UBHh, L1UBHx, L1UBKx, L2UBHh, L2UBK1L2UBKx

Notes:

BAARI = Bay Area Aquatic Resource Inventory; HCP = Habitat Conservation Plan; NCCP = Natural Community Conservation Plan; RCIS = regional conservation investment strategy.

N/A = The corresponding classification system does not have a similar land cover type that can be cross walked to the RCIS type.

[a] California Department of Fish and Wildlife (2018a).

[b] CDFW Natural Communities List complies with the National Vegetation Classification Standard (NVCS) (Federal Geographic Data Committee 2008). NVCS is a hierarchical classification consisting of eight levels. Table 2-3b includes two CDFW natural community levels: group and alliance. Groups are defined by relatively narrow sets of diagnostic plant species, broadly similar composition, and diagnostic growth forms that reflect biogeographic differences in composition. Alliances are grouped into groups. Alliances are defined by diagnostic plant species and moderately similar composition that reflects regional to subregional environmental factors such as climate, hydrology and disturbance regimes (Federal Geographic Data Committee 2008).

[c] When three or more California Department of Fish and Wildlife Natural Communities List (California Department of Fish and Wildlife 2018a) alliances correspond to a single Santa Clara County RCIS land cover type, the next higher (i.e., broader) level from the National Vegetation Classification Hierarchy (NVCH) that includes all corresponding alliances is given (i.e., group).

[d] San Francisco Estuary Institute and Aquatic Science Center (2015a).

[e] California Department of Fish and Wildlife (2018b).

[f] San Francisco Estuary Institute and Aquatic Science Center (2015b).

[g] ICF International (2012).

[h] U.S. Fish and Wildlife Service (2016).

Table 2-4. Wetland and Aquatic Land Cover Types within each Watershed (acres)

	Wetlands and Ponds						Baylands				
Watershed	**Perennial Freshwater Marsh**	**Seasonal Wetland**	**Seep/ Spring Non-serpentine**	**Seep/Spring Serpentine**	**Pond**	**Reservoir**	**Shallow Bay**	**Tidal Bay Flat**	**Tidal Unnatural**	**Tidal Vegetation**	***Total***
Agua Caliente Creek	-	-	-	-	2.7	-	-	-	-	-	***2.7***
Alameda Creek	0.8	-	1.6	-	15.0	-	-	-	-	-	***17.4***
Arroyo Hondo	83.9	0.9	46.9	-	113.2	1,357.7	-	-	-	-	***1,602.7***
Arroyo Mocho	-	-	0.1	-	6.8	-	-	-	-	-	***6.9***
Arroyo Valle	32.2	-	12.3	-	161.9	1.9	-	-	-	-	***208.4***
Guadalupe River	117.0	9.6	4.3	10.9	447.9	1,100.5	-	-	0.1	47.0	***1,737.4***
Llagas Creek	77.9	15.8	-	6.7	214.5	206.2	-	-	-	-	***521.1***
Lower Coyote Creek	154.5	85.6	21.2	13.3	379.5	165.3	-	-	-	-	***819.4***
Pacheco Creek	4.2	15.4	-	6.7	254.7	199.0	-	-	-	-	***480.0***
Pajaro River	38.4	0.5	-	-	81.3	175.9	-	-	-	-	***296.2***
San Francisco Bay	313.0	402.9	-	-	556.2	-	627.2	2,530.3	8,052.4	2,695.1	***15,177.2***
Saratoga Creek	106.1	15.3	1.7	-	171.6	169.4	2.0	0.3	15.3	64.3	***546.0***
Tequisquita Slough	-	1.0	-	0.4	5.2	-	-	-	-	-	***6.5***
Upper Coyote Creek	171.5	35.5	31.8	2.0	185.6	1,778.1	-	-	-	-	***2,204.34***
Uvas Creek	30.5	7.2	-	-	153.3	263.0	-	-	-	-	***454.1***

Stream Layer

High Resolution Flowlines from the National Hydrography Dataset (NHD) (U.S. Geological Survey 2016) were used to represent streams in the RCIS area. All records that fell within the RCIS area were used. The NHD was used because the dataset includes stream attributes necessary to model aquatic species' habitat (e.g., identification of perennial, ephemeral, and intermittent stream status). The NHD was also selected to provide continuity in the stream layer data across the entire RCIS area. Figure 2-11 shows the streams in the RCIS area.

2.2.4.2 Natural Communities and Land Cover Types in the RCIS Area

Natural communities are an assemblage of species that co-occur in the same habitat or area and interact through trophic and spatial relationships. Communities are typically characterized by reference to one or more dominant species (Lincoln et al. 1998). Natural communities are defined by the vegetative communities, as identified by land cover types for this Santa Clara County RCIS. The RCIS area includes seven natural communities (Table 2-5).

In addition to the natural communities and respective land cover types, the RCIS area also includes two categories of non-natural land cover types.

- Cultivated agriculture
- Urban

Table 2-5 presents the amounts of natural communities and land cover types in the RCIS area. Figure 2-12 depicts the natural communities in the RCIS area, and Figure 2-13 depicts the land cover types in the RCIS area. The natural communities and the land cover types associated with each community, as well as cultivated agriculture and urban land cover types, are described below. These descriptions are based on the descriptions of land cover from CLN (Bay Area Open Space Council 2011) and the Habitat Plan (ICF International 2012).

Table 2-5. Extent of Natural Communities[a] and Land Cover Types in the RCIS Area

Santa Clara County RCIS Land Cover Type	Acres in RCIS Area	Percent of RCIS Area
Grassland	**131,326**	**15.7**
California annual grassland	115,537	13.8
Serpentine grassland[b]	14,348	1.7
Serpentine rock outcrop[b,c]	268	< 0.1
Barren/Rock	1,173	0.1
Shrublands	**120,086**	**14.4**
Northern mixed chaparral/chamise chaparral	99,214	11.9
Serpentine chaparral[b]	5,879	0.7
Northern coastal scrub/Diablan sage scrub[b]	14,993	1.8
Woodland	**240,929**	**28.9**
Blue oak woodland	37,820	4.5
Valley oak forest and woodland[b]	15,501	1.9
Coast live oak forest and woodland	65,811	7.9
Mixed oak woodland and forest	98,180	11.8

Santa Clara County RCIS Land Cover Type	Acres in RCIS Area	Percent of RCIS Area
Montane hardwood[b]	19,917	2.4
Serpentine hardwood[b]	3,700	0.4
Conifer Forest	**69,796**	**8.4**
Redwood forest[b]	14,996	1.8
Douglas fir forest[b]	15,567	1.9
Serpentine conifer[b]	754	0.1
Coulter pine forest[b]	198	< 0.1
Knobcone pine forest[b]	709	0.1
Ponderosa pine woodland	37,571	4.5
Riparian Woodland	**7,866**	**0.9**
Central coast riparian forest[b]	3,663	0.4
Sycamore alluvial woodland[b]	4,086	0.5
Serpentine riparian[b]	117	< 0.1
Baylands	**14,034**	**1.7**
Shallow bay	629	0.1
Tidal bay flat[b]	2,531	0.3
Tidal unnatural	8,068	1.0
Tidal vegetation[b]	2,806	0.3
Wetland and Pond	**10,046**	**1.2**
Perennial freshwater marsh[b]	1,130	0.1
Seasonal wetland[b]	590	0.1
Seep/Spring (non-serpentine)[b,c]	120	< 0.1
Seep/Spring (serpentine)[b,c]	40	< 0.1
Pond[b]	2,750	0.3
Reservoir	5,417	0.6
Cultivated Agriculture[a]	**40,877**	**4.9**
Cultivated–undetermined	1,567	0.2
Developed agriculture	1,928	0.2
Grain, row-crops, disked	33,294	4.0
Orchard	2,696	0.3
Vineyard	1,391	0.2
Urban[a]	**199,595**	**23.9**
Urban	186,979	22.4
Rural residential	12,400	1.5
Ornamental woodland	216	< 0.1
Grand Total	**834,556**	

Notes:

RCIS = Regional Conservation Investment Strategy.

[a] Cultivated agriculture and urban are considered non-natural communities.

[b] Identified as a rare/unique land cover type in the RCIS area (Section 2.3.3, *Unique Land Cover Types*).

[c] This land cover type is likely undermapped because it occurs in areas smaller than the minimum mapping unit.

Grassland

The grassland natural community consists of herbaceous vegetation dominated by grasses and forbs. A total of 15.7% of the RCIS area consists of grasslands, which provides ecosystem services such as carbon sequestration, nutrient cycling, and agricultural benefits (Jones and Donnelly 2004). Grasslands are found in upland topographic locations, generally irrespective of landscape position, slope, and aspect. Areas devoid of vegetation, but located within grasslands are also included in this natural community as individual land cover types (Figure 2-14).

Grassland in the RCIS area is classified into four land cover types.

- California annual grassland
- Serpentine grassland
- Serpentine rock outcrop
- Barren/rock

California Annual Grassland

The California annual grassland land cover type is an herbaceous plant community dominated by non-native annual grasses (Holland 1986, Sawyer and Keeler-Wolf 1995). California annual grassland is defined as areas where grasses and forbs occur as extensive stands without an overstory. The dominant grasses generally consist of introduced annual grasses, including, foxtail chess (*Bromus madritensis*), Harding grass (*Phalaris aquatica*), hare barley (*Hordeum murinum* ssp. *leporinum*), nit grass (*Gastridium phleoides*), oats (*Avena barbata* and *A. fatua*), rattail sixweeks grass (*Festuca myuros*), ripgut grass (*Bromus diandrus*), Italian rye grass (*Festuca perennis*), silver hair grass (*Aira caryophyllea*), small fescue (*Festuca microstachys*), soft chess (*Bromus hordeaceus*), barbed goat grass (*Aegilops triuncialis*) and water beard grass (*Polypogon viridis*). The associated herbaceous cover includes native and non-native forbs. Common herbaceous species in the RCIS area include black mustard (*Brassica nigra*), California poppy (*Eschscholzia californica*), clover species (*Trifolium* spp.), small flowered fiddleneck (*Amsinckia menziesii*), common yarrow (*Achillea millefolium*), filaree species (*Erodium* spp.), four-spot (*Clarkia purpurea* ssp. *quadrivulnera*), Ithuriel's spear (*Triteleia laxa*), knapweed species (*Centaurea* spp.), lupine species (*Lupinus* spp.), purple owl's-clover (*Castilleja exserta*), and soap plant (*Chlorogalum pomeridianum*).

Native, non-serpentine grasslands are patchily distributed within the larger California annual grassland land cover type. These native grasslands include an abundance of non-native annual grasses, interspersed with perennial grasses and forbs. Thus, native grassland cannot be distinguished from California annual grassland at the mapping scale used for this Santa Clara County RCIS. Consequently, native grass patches are included in the California annual grassland land cover type.

California annual grassland occupies an estimated 115,537 acres (13.8%) of the RCIS area. This land cover type is generally scattered throughout the RCIS area.

Serpentine Grassland

The serpentine grassland land cover type is grassland that occurs on serpentine soils. Many serpentine species are partially or completely confined to growing on this substrate (Safford et al. 2005). Native bunchgrasses in serpentine habitat are generally similar to those in non-serpentine habitats, although serpentine populations may be more tolerant of heavy metals present in the soil and may have lower growth rates compared to non-serpentine populations (Huntsinger et al. 1996).

Serpentine grassland is a mosaic of perennial bunchgrass stands, perennial and annual grasses, and herbaceous wildflower species (McCarten 1987). The flora is composed primarily of native species (although non-native species such as soft chess can also be common), and is generally more diverse than the flora of grasslands on non-serpentine substrates (McNaughton 1968). Plants typical of this habitat vary in their affinity to serpentine soils, from those that are strong indicators to those that also occur in non-serpentine grasslands. Generalist grassland species include grasses such as Italian rye grass, purple needlegrass (*Stipa pulchra*), Torrey's melicgrass (*Melica torreyana*), big squirreltail (*Elymus multisetus*), California melic (*Melica californica*), California oat grass (*Danthonia californica*), and forbs such as dwarf plantain (*Plantago erecta*) and common muilla (*Muilla maritima*). Wildflowers that often form patches of color within the grassland matrix include California goldfields (*Lasthenia californica* ssp. *californica*), California poppy, hayfield tarweed (*Hemizonia congesta*), purple owl's-clover, rosin weed (*Calycadenia truncata*), common yarrow, tidy-tips (*Layia platyglossa*) and lomatium species (*Lomatium* spp.). Species strongly associated with serpentine soils, and thus indicators for serpentine grassland, include, jeweled onion (*Allium serra*), Franciscan wallflower (*Erysimum franciscanum*), serpentine leptosiphon (*Leptosiphon ambiguus*), most beautiful jewelflower (*Streptanthus albidus* ssp. *peramoenus*), and smooth lessingia (*Lessingia micradenia* var. *glabrata*) (Hobbs and Mooney 1985, Holland 1986, McCarten 1987, Hooper and Vitousek 1998, Evens and San 2004).

Serpentine grassland occupies approximately 14,348 acres (11.7%) of the RCIS area and is mainly located in the area of Coyote Ridge in San José and Morgan Hill, to the immediate east and west of U.S. 101.

Serpentine Rock Outcrop

The serpentine rock outcrop land cover type is exposures of serpentinite bedrock that typically lack soil. Plant species composition tends to be dominated by natives with a sparse cover of non-native species. Serpentine rock outcrops provide important habitat for some species like Santa Clara Valley dudleya (*Dudelya setchellii*) and annual plantain, which provides habitat for bay checkerspot butterfly (*Euphydryas editha bayensis*). This land cover type is found strictly in areas of serpentine soils or geology.

Serpentine rock outcrop covers approximately 268 acres (<0.1 %) and is found in the same locations as serpentine grassland.

Barren/Rock

The barren/rock land cover type includes non-agricultural areas that are devoid of vegetation. Barren areas are historically and recently disturbed land in urban areas. Land uses in barren areas can include aggregate facilities and mine tailings. Rock areas are non-serpentine rock outcrops, which are exposures of bedrock that typically lack soil and have sparse vegetation. Within the RCIS area, several types of rock outcrops are present and are derived from sedimentary, volcanic, and metamorphic sources. These rock outcrops can support native species and provide important habitat for species in the RCIS area.

The barren/rock land cover type occupies approximately 1,173 acres (0.1 %) of the RCIS area and is primarily found as barren or rocky patches within California annual grassland, although this land cover type is present within chaparral and oak woodlands.

Shrublands

The shrublands natural community is composed of two distinct vegetation communities, chaparral and scrub land cover types. A total of 14.4% of the RCIS area consists of shrublands, which provides ecosystem services such as carbon sequestration, nutrient cycling, forage for wildlife, and passive open space values (Garnache et al. 2018). Chaparral occurs on rocky, porous, nutrient-deficient soils on steep slopes up to 6,562 feet in elevation (Keeley 2002). These communities are dominated by densely packed and nearly impenetrable drought-adapted evergreen woody shrubs with small, thick, leathery sclerophyllous leaves (Hanes 1988, Keeley 2002). In comparison, the scrubland cover types generally consist of low “soft” shrubs in open to dense shrublands, interspersed with grassy openings or little to no herbaceous layer.

Shrublands in the RCIS area is classified into three land cover types (Figure 2-15).

- Northern mixed chaparral/chamise chaparral
- Serpentine chaparral
- Northern coastal scrub/Diablan sage scrub

Northern Mixed Chaparral/Chamise Chaparral

The northern mixed chaparral land cover type includes a variety of shrubs with thick, stiff, sclerophyll leaves where no one species is clearly dominant. At maturity, this community can be dense and nearly impenetrable. Stand structure is dependent on age since last burn, precipitation, aspect, and soil type. Dominant species include chamise (*Adenostoma fasciculatum*), birchleaf mountain mahogany (*Cercocarpus betuloides*), silktassle (*Garrya* spp.), coyote bush (*Baccharis pilularis*), holly leaf cherry (*Prunus ilicifolia*) and buck brush (*Ceanothus cuneatus*), chaparral whitethorn (*C. leucodermis,*), Eastwood’s manzanita (*Arctostaphylos glandulosa*), big berry manzanita (*A. glauca*), redberry (*Rhamnus ilicifolia*), canyon live oak (*Quercus chrysolepis*), scrub oak (*Q. dumosa*), inland scrub oak (*Q. berberidifolia*), and interior live oak (*Q. wislizeni*) (Holland 1986, Mayer and Laudenslayer 1998). Chamise chaparral supports pure or nearly pure stands of chamise. Due to the density of the vegetation, there is usually little or no understory. This community generally occurs below 3,000 feet elevation on mountain ranges in northern California. This land cover type is often found on dry, rocky, steep slopes with little soil (U.S. Geological Survey 2012).

Northern mixed chaparral/chamise chaparral occupies approximately 120,086 acres (11.9%) of the RCIS area and is found on the immediate western and eastern borders of Santa Clara County.

Serpentine Chaparral

The serpentine chaparral land cover type is also dominated by shrubs with thick, stiff, sclerophyll leaves, but tends to be of shorter stature and more open than the northern mixed chaparral/chamise chaparral land cover type (Hanes 1988). In addition, species composition is restricted to those shrubs that are adapted shallow, stony, infertile soils derived from serpentine. Serpentine chaparral usually occurs below 5,000 feet elevation. Dominant species include chamise, toyon (*Heteromeles arbutifolia*), California juniper (*Juniperus californica*), foothill pine (*Pinus sabiniana*), yerba santa

(*Eriodictyon californicum*), leather oak (*Q. durata*), and multiple species of ceanothus including Coyote ceanothus (*C. ferrisae*) (Holland 1986).

Serpentine chaparral occupies approximately 65,879 acres (0.7%) of the RCIS area and is scattered throughout the RCIS area on the east and west side of the Santa Clara Valley.

Northern Coastal Scrub/Diablan Sage Scrub

The northern coastal scrub/Diablan sage scrubland cover type is composed primarily of evergreen shrubs with an herbaceous understory in openings. This land cover type is usually found at elevations below approximately 1,640 feet (Holland and Keil 1995). The northern coastal scrub/Diablan sage scrubland cover type is typically dominated by California sagebrush (*Artemisia californica*) and black sage (*Salvia mellifera*), with associated species including coyote brush, California buckwheat (*Eriogonum fasciculatum*), poison oak (*Toxicodendron diversilobum*), and sticky monkeyflower (*Diplacus aurantiacus*) (Holland 1986). Northern coastal scrub/Diablan sage scrub occurs on both serpentine and non-serpentine substrate. The dominant woody plants in this land cover type are nearly the same among different soil types.

Northern coastal scrub/Diablan sage scrub occupies approximately 14,993 acres (1.8%) of the RCIS area and is located in small, scattered patches dispersed throughout the northern mixed chaparral/chamise chaparral land cover type.

Woodland

The woodland natural community is an upland vegetation community dominated by hardwood tree species, characterized by a prevalence of various species of oaks (*Quercus* spp.). A total of 28.9% of the RCIS area consists of woodlands, which provides ecosystem services such as carbon sequestration, nutrient cycling, erosion control, forage for wildlife, and passive open space values (U.S. Department of Agriculture 2018). The composition of this natural community can range from open savannas with grassy understories to dense woodlands with persistent leaf litter that precludes much herbaceous understory or shrubby understories. The canopy can vary from pure stands of oak trees to stands intermixed with other broadleaf and coniferous trees.

Woodland in the RCIS area is classified into six land cover types (Figure 2-16).

- Blue oak woodland
- Valley oak forest/woodland
- Coast live oak forest and woodland
- Mixed oak woodland and forest
- Montane hardwood
- Serpentine hardwood

Blue Oak Woodland

The blue oak woodland land cover type is dominated by blue oak (*Q. douglasii*), a highly drought-tolerant species adapted to growth on thin soils in the dry foothills. Blue oaks grow slowly in these soils and may take decades to reach maturity, forming open savanna-like woodlands. They generally occur on sites that are drier and have lower levels of nitrogen, phosphorus, and organic matter than those where valley oak (*Q. lobata*), or coast live oak (*Q. agrifolia*) are found (Griffin 1973, Baker et al.

1981). Although blue oaks are generally found on north-facing slopes throughout their range (Griffin 1971), in the Central California Coast Ranges, blue oak woodland is more common on south-facing slopes (Miles and Goudey 1997). California buckeye (*Aesculus californica*) and foothill pine are associate tree species in this community.

The understory varies from shrubby to open, with a composition similar to that of the adjacent California annual grassland. Understory species include California annual grasses, California coffeeberry (*Frangula californica*), holly leaf cherry, and poison oak. Blue oak woodland is considered a sensitive natural community by CDFW (California Department of Fish and Wildlife 2018a) when blue oak and valley oak are present.

Blue oak woodland occupies approximately 37,820 acres (4.5%) of the RCIS area and is located mainly on the east side of the RCIS area adjacent to other woodland types.

Valley Oak Forest and Woodland

The valley oak forest and woodland land cover type is characterized by a fairly open canopy of mature valley oaks with a grassy understory, generally on valley bottoms and north-facing slopes (Griffin 1971, Holland 1986, Sawyer and Keeler-Wolf 1995). Valley oak forest and woodland often forms a mosaic with annual grasslands and are also found adjacent to other land cover types, including mixed oak woodland, blue oak woodland, and riparian woodland types. Valley oak forest and woodland is generally denser on valley bottoms, where the tree roots can penetrate to the groundwater, and less dense on ridges where trees need wider spacing to develop larger root systems (Griffin 1973). Although valley oak forest and woodland are typically found in alluvial soils in California, it occurs in non-alluvial sites on broad ridgetops and mid-slope benches.

Trees in the valley oak forest and woodland land cover type are typically mature and well-spaced. They are usually the only trees present in this open-canopy woodland, have no shrub layer, and the understory is dominated by California annual grassland. As with most oak communities, regeneration typically is episodic, occurring periodically in “mast years,” when acorn production is high, and some acorns germinate by avoiding acorn predators such as acorn woodpeckers and California ground squirrels. Beardless wild rye (*Elymus triticoides*), California rose (*Rosa californica*), mugwort (*Artemisia douglasiana*), and poison oak are common native species in riparian portions of valley oak woodland.

Valley oak forest and woodland occupies approximately 15,501 acres (1.9%) of the RCIS area, mainly on the east side of the valley floor and occurs adjacent to other woodland types.

Coast Live Oak Forest and Woodland

The coast live oak forest and woodland land cover type mostly includes stands of coast live oak, although California bay (*Umbellularia californica*) is often a major component, and other interior live oaks and scattered deciduous trees are often present. Across the Central Coast Ranges, stands occur at lower elevations (200 to 3,250 feet) on north and northeast aspects. Slopes are generally steep (36% on average), and parent material is primarily sedimentary sandstone and shale with loam soils (Allen-Diaz et al. 1999).

Grasses and herbs are common in this land cover type. Other species found in this cover type include California coffeeberry, California sagebrush, and spiny redberry (*Rhamnus crocea*) (Allen-Diaz et al. 1999). In addition, bugle hedge nettle (*Stachys ajugoides*), California blackberry (*Rubus ursinus*), California wood fern (*Dryopteris arguta*), and poison oak are often present.

Coast live oak forest and woodland occupies approximately 65,811 acres (7.9%) of the RCIS area around the valley floor and occurs adjacent to other woodland types.

Mixed Oak Woodland and Forest

The mixed oak woodland and forest land cover type includes coast live oak, valley oak, and blue oak trees where no species is clearly dominant, or where different types of oak woodlands are present in a small-scale mosaic and each type occurs in patches too small to map. This habitat includes a mixture of interior live oak and deciduous oaks. Evergreen broadleaved trees such California bay, Pacific madrone (*Arbutus menziesii*), tanoak (*Notholithocarpus densiflorus*), conifers such as Douglas fir (*Pseudotsuga menziesii*), Coulter pine (*Pinus coulteri*), and foothill pine, and deciduous species such as California buckeye and big leaf maple (*Acer macrophyllum*) frequently occur in this land cover type.

Mixed oak woodland and forest is a dominant woodland land cover type in the RCIS area and occupies approximately 98,180 acres (11.8%). It is found primarily on the eastern side of the Santa Clara Valley, but is also present on the lower foothills of the Santa Cruz Mountains.

Montane Hardwood

The montane hardwood land cover type is dominated by broadleaved trees, often with taller conifers interspersed, forming a closed forest. Montane hardwood forests occur on a wide range of slopes with soils that are rocky, alluvial, coarse textured, poorly developed, and well drained. Tree height tends to be uniform, expect where conifers are present. Typically, montane hardwood species include white alder (*Alnus rhombifolia*), coast live oak, big leaf maple, California bay, Pacific madrone, Douglas fir, tanoak, and occasionally valley oak and blue oak. Associated conifers species may include foothill pine, ponderosa pine (*Pinus ponderosa*), Coulter pine, black oak (*Q. kelloggii*), and knobcone pine (*P. attenuata*). The scattered understory vegetation can consists of manzanita, mountain mahogany, and poison oak, as well as patches of forbs and grasses (Holland 1986, Mayer and Laudenslayer 1998).

Montane hardwood occupies approximately 19,917 acres (2.4%) of the RCIS area and is most dense in the Sierra Azul Open Space Preserve on the west side of the Santa Clara Valley, but is scattered throughout the Santa Cruz Mountains and in the northeastern corner of the RCIS area.

Serpentine Hardwood

The serpentine hardwood land cover type is composed of species associated with the montane hardwood land cover type on serpentine soils. Leather oak, which is often a serpentine endemic, often grows as a component of the serpentine chaparral community but is classified as serpentine hardwood when intermixed with other hardwood species. Serpentine tolerant hardwood species include California buckeye, California bay, western redbud (*Cercis occidentalis*), and canyon live oak (Frazell et al. 2009).

Serpentine hardwood occupies approximately 3,700 acres (0.4%) of the RCIS area and occurs mainly in the Santa Cruz Mountain and in the vicinity of Coyote Ridge.

Conifer Forest

The conifer forest natural community is an upland vegetation community dominated by cone-bearing, needle-leaved or scale-leaved evergreen trees. The canopy can range from open to continuous with one or two tiers. Shrub layers are sparse to continuous, and herbaceous cover can be sparse to abundant. A total of 8.4% of the RCIS area consists of conifer forests, which provides ecosystem services such as carbon sequestration, nutrient cycling, erosion control, forage for wildlife, and passive open space values (U.S. Department of Agriculture 2018). Landforms associated with conifer forest include slopes, ridges, headlands, maritime terraces, rocky ridges, and sand dunes.

Conifer forest in the RCIS area is classified into six land cover types (Figure 2-17).

- Redwood forest
- Douglas fir forest
- Serpentine conifer
- Coulter pine forest
- Knobcone pine woodland
- Ponderosa pine woodland

Redwood Forest

The redwood forest land cover type is dominated by an overstory of redwood with a variety of associated tree, shrub, and forb species in the understory. Most redwood forests have been logged since the second half of the nineteenth century, and most of the existing trees are stump sprouts. However, in many areas, particularly along creeks, dense cover of redwood trees has been maintained. Areas that were burned following logging now support chaparral or oak-dominated communities.

Redwood forests occur in areas that receive substantial rainfall, generally more than 35 inches per year. Common plants associated with these forests include trees such as California bay, madrone, and tanoak; the shrub layer includes species such as black huckleberry (*Vaccinium ovatum*), California hazelnut (*Corylus cornuta* var. *californica*), and thimbleberry (*Rubus parviflorus*). In riparian areas, California bay and big leaf maple are common, California nutmeg (*Torreya californica*) may occur, and ferns such as sword fern (*Polystichum munitum*) often form a dense layer.

Redwood forest occupies approximately 14,996 acres (1.8%) of the RCIS area. This land cover type is uncommon in the RCIS area, only occurring in the Santa Cruz Mountains along the Santa Cruz-Santa Clara County boundary. Redwood forest occurs along creeks and valleys, generally on north-facing slopes. Stands of redwoods are found along Uvas (Uvas Canyon County Park), Llagas, and Arthur Creeks.

Douglas Fir Forest

The Douglas fir forest land cover type is typically comprised of closed canopy stands in the Santa Cruz Mountains portion of the RCIS area. In this land cover type, Douglas fir is nearly always associated with redwoods and tanoaks and supports an understory similar to the redwood forest land cover type. In the Santa Cruz Mountains, Douglas fir grows on north facing slopes (with moister sites) with well-drained, deep soils composed of weathered marine sandstones and shales (University of California 2017). Other associated hardwoods include California bay, Pacific madrone, and big leaf maple.

Douglas fir forest occupies approximately 15,567 acres (1.9%) of the RCIS area. Douglas fir forest is generally intermixed with the redwood forest land cover type in the RCIS area.

Serpentine Conifer

The serpentine conifer land cover type is comprised of coniferous forest in arid landscapes on serpentine soils. Serpentine coniferous forest consists of dense to open mono-dominant stands of conifer trees that are strongly associated with serpentine soils but also occur on other soil types. Knobcone pine forms dense single-aged stands, usually on serpentine or other shallow rocky soils, on hilltops that receive moisture from clouds or fog. California juniper, Coulter pine, ponderosa pine, and foothill pine are widespread on non-serpentine soils but can occur on isolated stands of dry rock serpentine outcrops (Alexander et al. 2006, Frazell et al. 2009). This land cover type supports a shrubby understory comprised of species similar to those representative of the serpentine chaparral land cover type. Serpentine conifer usually occurs in areas with more xeric exposure but integrates with the serpentine chaparral land cover type in flatter, more mesic areas. Dominant species in the serpentine conifer land cover type include chamise, manzanita species, buck brush, leather oak, and foothill pine (Holland 1986).

Serpentine conifer occupies approximately 754 acres (0.1%) of the RCIS area in small patches in the Santa Cruz Mountains between Los Gatos and Gilroy, in Anderson Lake County Park, Coyote Lake County Park, and Mount Hamilton.

Coulter Pine Forest

The Coulter pine forest land cover type is typically dominant in closed canopy stands. Other tree species that are commonly associated with Coulter pine woodlands include Douglas fir, black oak, canyon live oak, coast live oak, interior live oak, foothill pine, and ponderosa pine. The shrub layer can range from sparse to dense and the ground layer is typically sparse. Topographically, Coulter pine woodlands occur in uplands on all aspects. The soils tend to be shallow and well drained (Sawyer and Keeler-Wolf 1995).

Coulter pine woodland occupies approximately 198 acres (<0.1%) of the RCIS area in one small patch on Mount Hamilton.

Knobcone Pine Woodland

The knobcone pine woodland land cover type consists of dense stands of knobcone pines that regenerate following fire. This land cover type is uncommon in the RCIS area, found only in the Santa Cruz Mountains on ridgetops, often on serpentine-derived soils. It is thought that the water-retaining properties of serpentinite, combined with the pine's ability to intercept marine fog, allow knobcone pine to persist in these locations (Vogl 1973).

Knobcone pine is an obligate fire-climax species—fire is required to melt the resin that seals the cones, releasing the seed. Fire also creates the bare mineral soil required for the seeds to germinate. Stands of knobcone pine are therefore even-aged, dating back to the last stand-replacing fire. Knobcone pine is fast growing, with a relatively short lifespan of 75 to 100 years, although approximately half the trees may die by 60 years of age (Vogl 1973). Knobcone pine woodland is replaced by chaparral at lower elevations and by conifers (e.g., redwood or Douglas fir) at higher elevations, and it may occur in a mosaic with chaparral, conifer, and oak dominated woodlands. Although knobcone pine usually occurs as dense, mono-dominant stands, it can also be associated with chaparral species such as manzanitas bush chinquapin (*Chrysolepis chrysophylla* var. *minor*) and bush poppy (*Dendromecon rigida*), that form a sparse to dense understory layer.

Knobcone pine woodland occupies approximately 709 acres (0.1%) of the RCIS area and is located in the Santa Cruz Mountains west of Morgan Hill along the Santa Cruz-Santa Clara County boundary.

Ponderosa Pine Woodland

The ponderosa pine woodland land cover type is dominated by an overstory of ponderosa pine with oaks trees in the understory. On ridges, ponderosa pines are often large and well-spaced, forming very open stands over annual grassland. Regeneration is common and many age classes are present. Associated tree species include black oak, coast live oak, and Pacific madrone. Few shrubs are present, although bigberry manzanita is common in some areas. Ponderosa pine is uncommon in the Coast Ranges; these stands are likely relicts of a wider distribution in the past when the climate was cooler.

Ponderosa pine woodland occupies approximately 37,571 acres (4.5%) of the RCIS area. Ponderosa pine woodland is found primarily on three high elevation ridges in Henry W. Coe State Park—Pine Ridge, Middle Ridge, and Blue Ridge—and extends downslope into north-facing canyons and valleys.

Riparian Woodland

The riparian woodland natural community is dominated by woody vegetation associated with riverine water sources. Riparian woodlands are dominated by trees and with an understory of shrubs and forbs. A total of 0.9% of the RCIS area consists of riparian woodlands, which provides ecosystem services such as improved water quality, erosion control, flood management, forage for wildlife, and passive open space values (U.S. Department of Agriculture 2018). From the foothills to the valley floor, riparian woodland land cover types are found along stream banks and floodplains in the RCIS area.

Riparian woodland in the RCIS area is classified into three land cover types (Figure 2-18).

- Central coast riparian forest
- Sycamore alluvial woodland
- Serpentine riparian

Streams are represented by the stream layer dataset (Section 2.2.4.1, *Methods and Data Sources*). Although not included in the land cover dataset, streams are described within this section on the riparian woodland natural community, as streams are a fundamental component of the riparian woodland natural community

Central Coast Riparian Forest

The central coast riparian forest land cover type is found in and along the margins of the active channel on intermittent and perennial streams. Generally, no single species dominates the canopy, and composition varies with elevation, aspect, hydrology, and channel type. The major canopy species throughout the RCIS area are California bay, California sycamore (*Platanus racemosa*), coast live oak, arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), and valley oak. Associated trees and shrubs include big leaf maple, California buckeye, Fremont cottonwood (*Populus fremontii* ssp.

fremontii), white alder, and other species of willow. Non-native invasive species that may be present include giant reed (*Arundo donax*) and Himalayan blackberry (*Rubus armeniacus*).

Central coast riparian forest occupies approximately 3,663 acres (0.4%) of the RCIS area.

Sycamore Alluvial Woodland

The sycamore alluvial woodland land cover type is generally present on broad floodplains and terraces along low gradient streams with deep alluvium. Areas mapped as sycamore alluvial woodland are generally open canopy woodlands dominated by California sycamore, often with white alder and willows. Other associated species include big leaf maple, valley oak, coast live oak, and California bay.

The understory is disturbed by winter flows, and herbaceous vegetation is typically sparse or patchy. Typically, plants such as blackberry (*Rubus* spp.), California buckeye, common chickweed (*Stellaria media*), coyote bush, goose grass (*Galium aparine*), Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus*), mule fat (*Baccharis salicifolia*), poison oak, and willows populate the stream banks.

Sycamore alluvial woodland occupies 4,086 acres (0.5%) of the RCIS area and all stands of this land cover type are found throughout the RCIS area along streams and creeks.

Serpentine Riparian

The serpentine riparian land cover type is composed of species associated with the Central Coast riparian forest land cover types on serpentine rocks.

Serpentine riparian occupies approximately 117 acres (<0.1%) of the RCIS area and occurs in very small patches in the Santa Cruz Mountains and the west side of the Diablo Range.

Streams

Streams in the RCIS area include perennial, intermittent, and ephemeral watercourses characterized by a defined bed and bank. Perennial streams support flowing water year-round in normal rainfall years. These streams are often marked on U.S. Geological Survey (USGS) quadrangle maps with a blue line, known as blue-line streams. Intermittent (seasonal) streams carry water through most or all of the dry season (May-October) in a normal rainfall year. More specifically, in the wet season, intermittent streamflow occurs when the water table is raised, or rejuvenated, following early season rains that fill shallow subsurface aquifers. Ephemeral streams carry water only during or immediately following a rainfall event. The principal watercourses in the Pajaro River Basin have some perennial reaches due to a combination of high groundwater levels (primarily in headwater reaches of tributaries and in the Pajaro River), agriculture runoff, and releases from dams in the valley floor reaches.

Streams are associated with riparian plants described in the riparian woodland community. The riparian plant composition and the width of the riparian corridor varies depending on channel slope, magnitude and frequency of channel and overbank flows, and the frequency and duration of flooding flows that inundate the broader floodplain.

There are approximately 2,340 miles of streams in the RCIS area, including 486 miles of perennial streams, 509 miles of intermittent streams, and 1,345 miles of ephemeral streams (Figure 2-11).

Wetland and Pond

The wetland and pond natural community includes open water and aquatic habitats subject to seasonal or perennial flooding or ponding and may have hydrophytic herbaceous vegetation. A total of 1.2% of the RCIS area consists of wetlands and ponds, which provides ecosystem services such as improved water quality, groundwater recharge, flood management, and forage for wildlife (Mitsch et al. 2015). Wetlands and ponds generally differ in their surface area to volume ratio, water level fluctuations, and vegetation cover. Wetlands typically support emergent vegetation, while ponds do not.

The wetland and pond natural community includes six land cover types (Figure 2-19).

- Perennial freshwater marsh
- Seasonal wetland
- Spring/seep (non-serpentine)
- Spring/seep (serpentine)
- Pond
- Reservoir

Perennial Freshwater Marsh

The perennial freshwater marsh land cover type is dominated by emergent herbaceous plants (e.g., reeds, sedges, grasses) with either intermittently flooded or perennially saturated soils. Perennial freshwater marshes are found throughout the coastal drainages of California wherever flowing water slows down and accumulates, even on a temporary or seasonal basis. A perennial freshwater marsh usually features shallow water that is often clogged with dense masses of vegetation, resulting in deep peaty soils. Plant species common to perennial freshwater marsh predominantly consist of cattails (*Typha* spp.), bulrushes and tules (*Schoenoplectus* and *Bolboschoenus* spp.), sedges (*Carex* spp.), and rushes (*Juncus* spp.). Dominant species in perennial freshwater marsh in the RCIS area include beard grass (*Polypogon* spp.), tall cyperus (*Cyperus eragrostis*), willow weed (*Persicaria lapathifolia*), yellow cress (*Rorippa* spp.), and water primrose (*Ludwigia* spp.) are common associates. Dominant species in non-tidal perennial freshwater marsh are narrow-leaved cattail (*Typha angustifolia*), broadfruit bur-reed (*Sparganium eurycarpum*) and perennial pepperweed (*Lepidium latifolium*) (Jones & Stokes 2002).

Perennial freshwater marsh occupies approximately 1,130 acres (0.1%) scattered throughout the RCIS area.

Seasonal Wetland

The seasonal wetland land cover type is freshwater wetland habitat that supports ponded or saturated soil conditions during winter and spring and is dry through the summer and fall until the first substantial rainfall. Seasonal wetlands consist of relatively low-growing vegetation similar to perennial freshwater marsh, such as rushes, sedges, and grasses (Bay Area Open Space Council 2011). The vegetation may also consist of wetland generalists, such as hyssop loosestrife (*Lythrum hyssopifolia*), cocklebur (*Xanthium* spp.), and Italian rye grass that typically occur in frequently disturbed sites, such as along streams. Common species in seasonal wetlands within the RCIS area include yellow cress and smartweed (*Persicaria* spp.).

Seasonal wetlands occupy approximately 590 acres (0.1%) of the RCIS area scattered throughout the RCIS area.

Spring/Seep (non-serpentine)

The seeps/springs land cover type is where water penetrates the root zone or ground surface and creates small wetlands that supports wetland vegetation. They usually form on hillside or along the base of hills or alluvial fans. They lack well-defined channels and are almost entirely dependent on groundwater (slope wetlands) (San Francisco Estuary Institute 2011). These provide a source of drinking water for wildlife in the area.

Seeps/Springs occupy approximately 120 acres (<0.1%) of the RCIS area and are mapped in areas east of the Santa Cruz Mountains.

Spring/Seep (serpentine)

The serpentine spring/seep land cover type is similar to non-serpentine seeps, except that it occurs on serpentine soils. Serpentine seeps/springs typically occur within a matrix of serpentine grassland. They are similar to non-serpentine seeps except that they support species adapted to serpentine soils such as Mount Hamilton thistle (*Cirsium fontinale* var. *campylon*), two-tooth sedge (*Carex serratodens*), iris-leaved rush (*Juncus xiphioides*), yellow monkeyflower (*Erythranthe guttata*), Italian rye grass, rabbitsfoot grass (*Polypogon monspeliensis*), and hoary coffeeberry (*Frangula californica* ssp. *tomentella*) (Alexander et al. 2006).

Seeps/Springs (serpentine) occupy approximately 40 acres (< 0.1%) of the RCIS area and are located where serpentine soils are present.

Pond

The pond land cove type is small perennial or seasonal water bodies with little or no vegetation. If vegetation is present, it is typically submerged, floating, or growing along the margins. Ponds may occur naturally or may be created or expanded for livestock use (stock ponds). Pond vegetation is influenced by surrounding land use, livestock and wildlife activity, and site soil and hydrology. Plants often associated with ponds include floating plants such as duckweed (*Lemna* spp.) or rooted plants such as cattails, bulrushes, sedges, rushes, watercress, and water-primrose. Stock ponds are often surrounded by grazing land with grazing livestock. Immediately adjacent to a stock pond, soil may be exposed due to the continued presence of livestock or wildlife (e.g., feral pigs). As a result, many stock ponds in the RCIS area are devoid of vegetation. Stock ponds, removed from grazing pressures or excessive wildlife activity, may be surrounded by wetland vegetation including willows, cattails, reeds, bulrushes, and sedges if the appropriate soil and hydrology is also present.

Ponds occupy an approximately 2,750 acres (0.3%) of the RCIS area and are scattered throughout the RCIS area.

Reservoir

The reservoir land cover type is large, open water bodies that are highly managed for water storage, water supply, flood protection, or recreational uses. Plants often associated with reservoirs include those plants common to deep water systems. Algae are the predominant photosynthetic organisms found in the open waters of reservoirs. Depending on reservoir temperature, water level, and other environmental conditions, algal blooms may occur, resulting in thick algal mats on the surface of the reservoir. Where reservoir edges are shallow, plant species similar to those found in ponds may be present. If a reservoir has steeper edges, water depth and fluctuations in reservoir height may prevent the establishment of vegetation. Upland and riparian trees that were not removed during the construction of the reservoir, or that were planted afterwards, may be present around the perimeter of the reservoir.

Reservoirs occupy an approximately 5,417 acres (0.6%) of the RCIS area and occur throughout the RCIS area.

Baylands

The baylands natural community consists of tidal wetland and tidally influenced aquatic and terrestrial areas below the topographical contour that corresponds to the maximum possible extent of the tides. This natural community is subject to tidal fluctuations in water height that may be natural or muted by man-made structures such as levees, tidal gates or culverts (San Francisco Estuary Institute 2011). A total of 1.7% of the RCIS area consists of baylands, which provides ecosystem services such as improved water quality, flood management, and forage for wildlife (Mitsch et al. 2015). The baylands natural community is located in the San Francisco Bay in the northern portion of the RCIS area. A summary of conservation strategies for the baylands is included in Appendix I, *Summary of Bayland Conservation Strategies*.

Baylands in the RCIS area is comprised of four land cover types (Figure 2-20).

- Shallow bay
- Tidal bay flat
- Tidal vegetation
- Tidal unnatural

Shallow Bay

The shallow bay land cover type is open water areas within San Francisco Bay (including other estuarine channels) entirely between 18 feet below mean lower low water and mean lower low water (Goals Project 1999). Shallow bay is submerged during even the lowest tide; as a result, these areas are too deep to support the types of vegetation found in tidal marsh habitats. The sediment of shallow bay is primarily mud. Eelgrass (*Zostera marina*) can grow underwater along the fringes of shallow bay (generally at an average of 6.5 feet) where enough light is available. However, wave action and desiccation stress prevent eelgrass from growing in very shallow areas.

Shallow bay is important for many invertebrates, fish, and waterbirds. The rich environment is an especially productive feeding area for many fish, including northern anchovy (*Engraulis mordax*), white sturgeon (*Acipenser transmontanus*), and jacksmelt (*Atherinopsis californiensis*). The eelgrass beds are a particularly productive part of the shallow bay and also provide refuge for organism to escape from predators. Shallow bay habitat also serves as an important migratory corridor for anadromous fish such as Chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss),* green sturgeon (*Acipenser medirostris*), and Pacific lamprey (*Entosphenus tridentata*). Harbor seal (*Phoca vitulina*) and California sea lion (*Zalophus californianus*) also utilize this habitat (Goals Project 1999, San Francisco Estuary Institute 2011).

Shallow bay occupies approximately 629 acres (0.1) of the RCIS area.

Tidal Bay Flat

The tidal bay flat land cover type occurs within intertidal areas with less than 10% vegetation cover (other than eelgrass). Tidal bay flats have areas of soft sediment that lie between the elevations of the lowest tides to the mean lower low water tidal datum, as dictated by the current tidal epoch. Tidal bay flats form when mud and other fine-grained sediments are deposited by tides or rivers on gently sloping beds. Tidal bay flats are extremely productive, supporting diatoms, worms and shellfish, fish, algae, eelgrass, shorebirds, and harbor seals. Mudflats are the most common type of Tidal Bay Flat (San Francisco Estuary Institute 2011, San Francisco Bay Conservation and Development Commission 2015).

Tidal bay flat occupies approximately 2,531 acres (0.3%) of the RCIS area.

Tidal Unnatural

The tidal unnatural land cover type is a man-made or modified tidal channel that conveys tidal water and runoff within tidal wetlands and other baylands. These can include tidal ditches, as well as flood control channels and canals. (San Francisco Estuary Institute 2011).

Tidal unnatural occupies approximately 8,068 acres (1%) of the RCIS area.

Tidal Vegetation

The tidal vegetation land cover type contains halophytic (i.e., plants that grow in high salinity water) wetland vegetation below the high tide line, subject to the ebb and flow of daily tides. Tidal vegetation colonizes microhabitats within the tidal marsh dependent upon tidal elevations and drainage patters. Tidal vegetation in the lowest, wettest portion of the marsh, where inundation/saturation is nearly permanent, typically includes California cordgrass (*Spartina foliosa*), pickleweed (*Salicornia pacifica*), bulrushes, and tules. Tidal vegetation is typically most expansive in the middle marsh. In these broad, nearly flat areas, dense woody pickleweed vegetation dominants the landscape mixed with scattered patches of salt marsh dodder (*Cuscuta salina*), jaumea (*Jaumea carnosa*) alkali heath (*Frankenia salina*), and saltgrass (*Distichlis spicata*). Often referred to as tidal plains, the middle marsh typically floods during higher tides but is not continually inundated/saturated. Higher marsh occurs in drier areas of the marsh above the mean high-water level along elevated or better-drained sediment deposits. These areas can be dominated by marsh gumplant (*Grindelia stricta* var. *angustifolia*), non-native grasses, marsh baccahris (*Baccharis glutinosa*), and coyote bush, and can integrate with the coastal freshwater community (San Francisco Estuary Institute 2011, U.S. Fish and Wildlife Service 2013).

Tidal vegetation occupies approximately 2,806 acres (0.3%) of the RCIS area.

Cultivated Agriculture

The cultivated agriculture community consists of cultivated row crops, vineyards, orchards, and other crops that require soil tillage. These crops provide agricultural values as an ecosystem service to the region (U.S. Department of Agriculture 2018). In the RCIS area, cultivated agriculture is located in the vicinity of Morgan Hill and Gilroy around U.S. 101. A total of 4.9% of the RCIS area consists of cultivated agriculture.

Cultivated agriculture is classified into five land cover types (Figure 2-21).

- Cultivated-undetermined

- Developed agriculture
- Grain, row-crop, disked
- Orchard
- Vineyard

Cultivated-undetermined

The cultivated undetermined land cover type is those areas where the land cover data and aerial imagery was too vague to categorize into a specific land cover type in the cultivated agriculture community.

Cultivated-undetermined occupies approximately 1,567 acres (0.2%) of the RCIS area.

Developed Agriculture

The developed agriculture land cover type is characterized by the presence of large agricultural buildings such as greenhouses, shadehouses, nurseries, corrals, or dairies. These intensive uses occur within agricultural areas, rather than urban settings.

Developed agriculture occupies approximately 1,928 acres (0.2%) of the RCIS area.

Grain, Row-Crop, Disked

The grain, row-crop, disked land cover type consists of tilled land not supporting orchard or vineyard and includes hay and pasture and a small amount of rice. Row-crops are those areas tilled and cultivated for agricultural crops such as corn, lettuce, peppers, and pumpkins. Irrigated or dry crop is usually harvested in rows as edible or useful herbaceous products such as cereals or vegetables for stock or human use. Agricultural crop fields are also occasionally planted for both animal forage and to improve nitrogen levels, as with legumes such as alfalfa or sweet clovers. This land cover type includes ruderal areas and areas that have been left fallow for several growing seasons. Ruderal sites may be dominated by weeds such as black mustard or thistles.

Hay is also produced in Santa Clara Valley for grain. Common vegetation includes fast-growing forage grasses, such as oats (*Avena* spp.) and Italian rye grass, as well as irrigated legumes such as alfalfa (*Medicago sativa*), sweetclover (*Melilotus* spp.), and clover. In some areas, non-native weedy vegetation, such as thistles, mustards, and a variety of other weedy forbs are also common.

Grain, row-crop, disked is the dominant cultivated agriculture land cover type, occupying approximately 33,294 acres (4%) of the RCIS area.

Orchard

The orchard land cover type is those areas planted in fruit-bearing trees. Orchards are usually evergreen or deciduous small trees producing fruit or nut crops, usually planted in rows with or without irrigation channels, such as apples, cherries, walnuts, peaches, and olives. Orchard is distinguished on the basis of its tree cover, canopy characteristics, and distinctive production rows.

Orchards occupy approximately 2,696 acres (0.3%) of the RCIS area.

Vineyard

The vineyard land cover type is characterized by row production pattern and open canopy. Vines or shrubs may dominant the woody component of plantations on agricultural or horticultural lands uses in the production of food or fiber such as vineyards devoted to grapes or kiwi fruit and shrubby nut or fruit crops such as blueberries or raspberries.

Vineyards occupy approximately 1,391 acres (0.2%) of the RCIS area, primarily in the southwestern portion of the RCIS area.

Urban

The urban community consists of areas where native vegetation has been replaced with residential, commercial, industrial, transportation, or with structures, paved and impermeable surfaces, horticultural plantings, turf, and lawn. Vegetation found in the urban land cover types is typically cultivated vegetation associated with landscaped residences, non-native planted street trees (i.e., elm, ash, liquidambar, pine, palm), and parklands. A total of 23.9% of the RCIS area consists of urban land.

Urban in the RCIS area is classified into three land cover types (Figure 2-13).

- Urban
- Rural residential
- Ornamental woodland

Urban

The urban land cover comprises areas dominated by residential, commercial, industrial, transportation, recreational structures, or other developed land use elements such as highways, city parks, and cemeteries. Vegetation found in the urban land cover type is similar to that of the rural residential land cover type, with the exception that these areas are more expansive and include large areas of turf and lawn.

The urban center in the RCIS area is located adjacent to the San Francisco Bay in the northern portion of Santa Clara County. The urban land cover type occupies approximately 186,979 acres (22.4%) of the RCIS area.

Rural Residential

The rural residential land cover type includes areas that have structures, paved and impermeable surfaces, horticultural plantings, and lawns smaller than 10 acres (irrigated lawns larger than 10 acres were mapped as urban parks). Rural residential areas of less than 10 acres that are adjacent to or surrounded by agriculture or natural land cover types were mapped as the adjacent land cover type. Vegetation found in the rural residential land cover type is usually in the form of landscaped residences, planted street trees (i.e., elm, ash, liquidambar, pine, palm), and parklands.

Rural residential occupies approximately 12,400 acres (1.5%) of the RCIS area adjacent to the grain, row-crop, disked land cover type between the cities of Morgan Hill and Gilroy.

Ornamental Woodland

The ornamental woodland land cover type is those areas where ornamental and other introduced species of trees, including *Eucalyptus* (usually *Eucalyptus globulus*) and Monterey pine (*Pinus radiata*) species, have been planted or naturalized and dominate, forming an open-to-dense canopy. Ornamental woodland was included as a separate land cover type because some stands could provide suitable nesting habitat for raptors.

Ornamental woodland occupies approximately 216 acres (<01%) in small patches mainly around Saratoga, Los Gatos, and Gilroy and isolated locations in the Mount Diablo Range.

2.2.5 Focal Species

Focal species are species whose conservation needs are addressed through this Santa Clara County RCIS. Discussions in this RCIS about conservation priorities, including land protection, enhancement, and restoration (Chapter 3, *Conservation Strategy*) are described within the context of the conservation needs for focal species. Therefore, selecting the species that are addressed in this RCIS was one of the first and most important decisions to determine the scope of the RCIS planning process.

2.2.5.1 Focal Species Selection Process

The focal species selection process consisted of the following three-step screening criteria process.

- Step 1. Identify potential focal species.
- Step 2. Apply screening criteria.
- Step 3. Finalize focal species list.

Each step is described in more detail below.

Step 1. Identify Potential Focal Species

The first step in developing the list of species was to compile a comprehensive list of declining and vulnerable species that occur or may occur in the RCIS areas or species that are not declining or vulnerable but provide additional conservation benefits. This list was compiled by reviewing a variety of publicly available sources. The list includes those taxa identified as species of greatest conservation need in the State Wildlife Action plan (SWAP) (California Department of Fish and Wildlife 2015) and species that have documented occurrences in the RCIS area as reported in the California Natural Diversity Database (CNDDB) (California Department of Fish and Wildlife, Natural Diversity Database 2019)(Appendix E, *Evaluation of Species for Inclusion as Focal Species*).

Other sources that were considered when identifying potential species to be addressed in this Santa Clara County RCIS include the following.

- The Habitat Plan.
- California Native Plant Society (CNPS) *Inventory of Rare and Endangered Vascular Plants of California* (California Native Plant Society 2016).
- CDFW lists of special animals and special plants (California Department of Fish and Wildlife, Natural Diversity Database 2016a and 2016b).

- A list of federally listed endangered and threatened species obtained from the USFWS for the RCIS area.
- Personal communication with local species experts occurring throughout the stakeholder and public outreach process, including wildlife agency staff and representatives of local environmental groups.

Step 2. Apply Screening Criteria

Once the potential focal species were identified, the following criteria were applied to each species to determine if it should be further considered for inclusion as a focal species in this Santa Clara County RCIS. To be addressed, the species must meet the following occurrence and data criteria, and meet at least one of the status, rarity, or conservation benefit criteria.

- **Occurrence.** The species is known or likely to occur in the RCIS area. Occurrence data were based on credible evidence.
- **Data.** Drawing on best available science and emerging data, sufficient data on the species' life history, habitat requirements, and occurrence within the RCIS area are available to propose viable conservation actions.
- **Status.** The species is listed by state or federal resource agencies as threatened or endangered or is a candidate for such listing; or the species is reasonably expected to be considered for listing within 10 years of RCIS approval. This includes species covered by the Habitat Plan.
- **Rarity.** The species is recognized by Nature Serve as Critically Imperiled (G1) or Imperiled (G2) globally, or is described as a Species of Greatest Conservation Need (SGCN) or Climate Vulnerable (CV) in the State Wildlife Action Plan, or is recognized by the CNPS as Rare, Threatened, or Endangered in California and elsewhere (1B) or Rare, Threatened or Endangered in California, but more common elsewhere (2B).
- **Provides Other Conservation Benefit.** If a species does not meet the above criteria but provides some other conservation benefit, it was considered for inclusion as a focal species. Species providing other conservation benefit are not necessarily declining or vulnerable but are those can help inform the conservation strategy. These species may include area-dependent species, umbrella species, indicator species, or keystone species, as defined below.
  - **Area-dependent species.** The species requires large, contiguous blocks of habitat and may therefore inform the placement of protected areas on the landscape.
  - **Umbrella species.** Conservation of an umbrella species would indirectly conserve multiple other species dependent on the same ecological conditions.
  - **Indicator species.** The species' abundance in a given area is believed to indicate the presence of certain environmental or ecological conditions suitable for a group of other species. This may include species that are particularly sensitive to climate change.
  - **Keystone species.** The species' impacts on a community or ecosystem are much larger than would be expected from the species' abundance.

Step 3: Finalize Focal Species Lists

As in all planning efforts, resources, time and budget to prepare this Santa Clara County RCIS were limited. Because a large number of species met the criteria, this list was pared to a more manageable number of species to limit the scope of the RCIS to be consistent with the available resources and schedule. The following additional factors were considered in order to further refine the focal species list and give priority to species that would benefit most from the RCIS and add conservation value to the conservation strategy.

- **Prioritize species that are anticipated to have mitigation needs for public infrastructure projects in the next 10 years**. All things being equal, threatened and endangered species anticipated to need mitigation as the result of public infrastructure projects in the next 10 years were prioritized for inclusion as focal species. The California State Legislature's stated purpose of the pilot RCIS program is to "identify regional conservation and conservation investments and aid the development of critical infrastructure through an open public process and using a science-based approach while also encouraging investments in conservation through advanced mitigation" (Assembly Bill 2087, Section 1). The 10-year horizon was selected because CDFW may approve an RCIS for an initial period of up to 10 years. The RCIS may be amended during or after this period to include additional focal species.[11]
- **Prioritize species in the RCIS area not completely addressed by the Habitat Plan over species completely addressed by the Habitat Plan.** Some species[12] that meet the criteria are covered by the Habitat Plan and have a range in the RCIS area that overlaps entirely within the Habitat Plan's plan area. Those species' conservation and mitigation needs will be fully addressed by the Habitat Plan. Such species were not included as focal species for this Santa Clara County RCIS because including those species provides little additional conservation benefit. All conservation efforts for those species, including any mitigation needs, would be accomplished through Habitat Plan and its implementing entity, the Santa Clara Valley Habitat Agency.
- **Prioritize species in the RCIS area that occur on unprotected lands and that may be impacted by development over species where the only known occurrences are on protected lands.** For a few of the species that meet the selection criteria, the only documented occurrences are on protected land (e.g., San Francisco collinsia [*Collinsia multicolor*], legenere [*Legenere limosa*], vernal pool fairy shrimp [*Branchinecta lynchi*]). Because these species of plants and wildlife have only been documented on federal, state, or regional parkland in the RCIS area pressures and stressors on those species are expected to be low compared to other species.
- **Prioritize species in the RCIS area that are not addressed by other regional conservation strategies.** There are many overlapping conservation or other planning strategies in the Bay Area that address one or more species. For example, species that occur only in the baylands portion of the strategy (e.g., Ridgway's rail, salt marsh harvest mouse) were not included as focal species. Instead, this Santa Clara County RCIS summarizes the conservation strategies provided by the conservation planning strategies and programs that address the baylands (Goals Project 2015). Species not addressed by any other regional strategies were prioritized over species that are already addressed by other regional conservation planning efforts.

[11] The list of potential focal species developed after applying the criteria in Step 2 but excluded in Step 3 are excellent candidates for a future addition to this Santa Clara County RCIS.
[12] These species include bay checkerspot butterfly, least Bell's vireo (*Vireo bellii pusillus*), Tiburon paintbrush (*Castilleja affinis* ssp. *neglecta*), coyote ceanothus (*Ceanothus ferrisiae*), Metcalf Canyon jewelflower (*Streptanthus albidus* ssp. *albidus*), and Santa Clara Valley dudleya (*Dudleya abramsii* ssp. *setchellii*).

Species that meet the screening criteria, whose needs are not completely addressed by the Habitat Plan or other regional conservation strategy, that do not occur only on protected land, and that are likely to need mitigation for transportation infrastructure projects within the next 10 years were included as focal species. This Santa Clara County RCIS includes 18 focal species, 10 wildlife species and eight plant species.

The screening criteria and evaluation process for each species evaluated for potential inclusion in this Santa Clara County RCIS as a focal species are presented in Appendix E, *Evaluation of Species for Inclusion as Focal Species*. Tables 2-6 and 2-7 show the focal wildlife and focal plant species selected for the RCIS, respectively.

Table 2-6. Santa Clara County RCIS Focal Wildlife Species

		Status[a]			Covered by Habitat Plan[b]
Scientific Name	**Common Name**	**Federal**	**State**	**Global**	
Fish					
Oncorhynchus mykiss	Central California Coast steelhead	T	–	G5T2Q	–
Oncorhynchus mykiss	South-Central California Coast steelhead	T	SSC	G5T2T3Q	–
Amphibians					
Ambystoma californiense	California tiger salamander (Central CA Distinct Population Segment)	T	T	G2G3	X
Rana boylii	Foothill yellow-legged frog	–	SC	G3	X
Rana draytonii	California red-legged frog	T	SSC	G2G3	X
Birds					
Agelaius tricolor	Tricolored blackbird	–	T	G5T1T2	X
Athene cunicularia	Burrowing owl	–	SSC	G4	X
Buteo swainsoni	Swainson's hawk	–	T	G5	–
Mammals					
Vulpes macrotis mutica	San Joaquin kit fox	E	T	G4T2	X
Puma concolor	Mountain lion	–	–	–	–

Notes:

a Status

Federal

E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.
C = listed as a candidate species, which is a species for which the U.S. Fish and Wildlife Service has on file sufficient information to warrant a listing.
= no listing.

State (CDFW July 2016, Special Animals List, Available: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406)

E = listed as endangered under the California Endangered Species Act.
T = listed as threatened under the California Endangered Species Act.
SSC = listed as a California special of special concern by the California Department of Fish and Wildlife
FP = listed as a fully protected by the California Department of Fish and Wildlife
SC = listed as a candidate species. A candidate species is one that the California Fish and Game Commission has formally declared a candidate species.
= no listing.

Global Conservation Status (Nature Serve 2015. Available http://explorer.natureserve.org/granks.htm)

G1 = critically imperiled- high risk of extinction due to extreme rarity (often 5 or fewer populations)

G2 = imperiled- high risk of extinction due to very restricted range, very few populations (often 20 or fewer populations)

G3 = vulnerable- moderate risk of extinction due to restricted range and very few populations (often 80 or fewer populations)

G4 = apparently secure- uncommon but not rare

G5 = secure- common, widespread and abundant

G#G# = Range rank; numeric range rank (e.g., G2G3) is used to indicate the range of uncertainty in the status of a species or community.

Q = Questionable taxonomy; taxonomic distinctiveness of this entity at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid.

T# = Infraspecific taxon; the status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank.

Rules for assigning T-ranks follow the same principles outlined for global conservation.

b Covered by the Santa Clara Valley Habitat Conservation and Natural Community Conservation Plan (Habitat Plan) (ICF International 2012. Available: http://scv-habitatagency.org/178/Santa-Clara-Valley-Habitat-Plan)

X Covered by the Habitat Plan

– Not covered by the Habitat Plan

Table 2-7. Santa Clara County RCIS Focal Plant Species

Scientific Name	Common Name	Status[a] Federal	State	Global	CRPR	Covered by Habitat Plan[b]
Centromadia parryi subsp. *congdonii*	Congdon's spikeweed	–	–	G3T2	1B.1	–
Cirsium fontinale var. *campylon*	Mount Hamilton thistle	–	–	G2T2	1B.2	X
Eriastrum tracyi	Tracy's eriastrum	–	R	G3Q	1B.2	–
Fritillaria liliacea	Fragrant fritillary	–	–	G2	1B.2	X
Hoita strobilina	Loma Prieta hoita	–	–	G2	1B.1	X
Lessingia micradenia var. *glabrata*	Smooth lessingia	–	–	G2T2	1B.2	X
Sanicula saxatilis	Rock sanicle	–	R	G2	1B.2	–
Streptanthus albidus subsp. *peramoenus*	Most beautiful jewelflower	–	–	G2T2	1B.2	X

Notes:

a **Status**

Federal

E = listed as endangered under the federal Endangered Species Act.

= no listing.

State

T = listed as threatened under the California Endangered Species Act.

R = listed as rare under the California Endangered Species Act.

= no listing.

Global (NatureServe 2015. Available http://explorer.natureserve.org/granks.htm)

G1 = Critically imperiled; at very high risk for extinction.

G2 = Imperiled; at high risk for extinction.

G3 = Vulnerable; at moderate risk for extinction.

G4 = Apparently secure; uncommon but not rare.

G5 = Secure; common, widespread and abundant.

G#G# = Range rank; numeric range rank (e.g., G2G3) is used to indicate the range of uncertainty in the status of a species or community.

T# = Infraspecific Taxon; the status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank.

Rules for assigning T-ranks follow the same principles outlined for global conservation status ranks. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1.

California Rare Plant Rank (CRPR) (California Native Plant Society 2016. Available http://www.cnps.org/cnps/rareplants/ranking.php)

1B = plants rare, threatened or endangered in California and elsewhere.

0.1- = seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)

0.2- = moderately threatened in California (20 to 80% of occurrences threatened/moderate degree of immediacy of threat)

b **Covered by the Santa Clara Valley Habitat Conservation and Natural Community Conservation Plan (Habitat Plan)** (ICF International 2012. Available: http://scv-habitatagency.org/178/Santa-Clara-Valley-Habitat-Plan)

X Covered by the Habitat Plan

– Not covered by the Habitat Plan

2.2.5.2 Habitat Distribution Models

Habitat distribution models were developed for most focal plant and wildlife species to predict where they could occur, based on known habitat requirements and previously documented occurrences.[13] Habitat distribution models were used to aid the development of the conservation strategy, including the conservation objectives and conservation actions for focal species (e.g., to protect a certain amount of habitat for a focal species). Habitat distribution models for the focal species are described in detail in the respective focal species profiles in Section 2.2.5.3, *Focal Species Profiles*. Methods used for all the models are described below. Habitat distribution models were developed for six of the eight focal plant species and nine of the 10 focal wildlife species. For rock sanicle and Tracy's eriastrum, there are too few known occurrences within the RCIS area to model suitable habitat with confidence. A habitat distribution model was not developed for mountain lion because this species has such a broad distribution in the RCIS area that modeling suitable habitat would not be informative. Rather, this RCIS displays least-cost corridors and predicted core areas in the Santa Cruz Mountains from Wilmers et al. (2013) (Section 2.2.5.3, *Focal Species Profiles, Mountain Lion*).

Eleven of the 15 RCIS habitat distribution models were adapted from the Habitat Plan's (ICF International 2012) habitat distribution models for focal species that are also covered by the Habitat Plan (Tables 2-6 and 2-7) (e.g., using the same habitat/land cover type relationships to create habitat distribution models). This RCIS also uses an updated version of a map of fish habitat types developed for the Habitat Plan that maps steelhead habitat (Figure 3-12 in the Habitat Plan). The RCIS uses habitat distribution models similar to those in the Habitat Plan to enable the development of consistent and compatible conservation strategies between this RCIS and the Habitat Plan.

Habitat distribution models for two focal species not covered by the Habitat Plan – Swainson's hawk and Congdon's Spikeweed – were developed for this RCIS. The habitat distribution model for Swainson's hawk was based on the habitat distribution model developed for the East Contra Costa County HCP/NCCP (Jones & Stokes 2006). The habitat distribution model for Congdon's spikeweed maps the species' potential habitat based on known habitat relationships in the vicinity of the cluster of occurrences in the RCIS area (Section 2.2.5.3, *Focal Species Profiles, Congdon's Spikeweed*).

Model Structure and Development Methods

The habitat distribution models were designed to estimate the extent and location of key habitat characteristics of each species and to be repeatable and scientifically defensible, while remaining as simple as possible. The models are spatially explicit, GIS-based "expert opinion models"[14] based on identification of suitable land cover types in the RCIS area and location of known species occurrences. Land cover types are the basic unit of evaluation for habitat modeling and developing conservation strategies for the focal species. See Section 2.2.4.1, *Methods and Data Sources* for a description of the methods and data sources used to compile the land cover data (including data for wetlands, baylands, and streams) used in this RCIS. Land cover types were identified as suitable habitat based on the known or presumed habitat requirements and use patterns of each species. When supported by appropriate data, the models also incorporate physical parameters, including the elevation limits of known occurrences or soil type. In some cases, perimeter zones that were

[13] Habitat distribution models were developed on a regional scale using regional data. The models are intended for use in regional planning and do not necessarily provide accurate site-specific species information. For project planning, model results must always be field-verified.

[14] The Habitat Plan refers to its habitat distribution models as "expert opinion models." The Habitat Plan and East Contra Costa County HCP/NCCP habitat distribution models were developed by consultant biologists in coordination with CDFW and USFWS biologists as part of the HCP/NCCP development process.

used to designate habitat are defined by a certain distance from a suitable land cover type. For example, one model parameter for Mount Hamilton thistle is serpentine soils within 25 feet of streams where the upland habitat is influenced by flooding or groundwater.

Habitats for wildlife were designated according to type of habitat use, such as breeding, foraging, aestivation, or movement habitat. Primary and secondary habitats for plants were designated according to the associated land cover types that characterize the locations of known occurrences, with occurrences more likely to occur in primary habitat than secondary habitat. Determination of suitable land cover types and additional physical parameters were based on data from peer-reviewed scientific literature. When data were inconclusive or contradictory, conservative values were used in estimating suitable habitat. Overall, the habitat distribution models likely overestimate the actual extent of suitable habitat for most focal species because some important habitat features cannot be spatially mapped at the scale of the RCIS area, or such mapping was beyond the scope of this Santa Clara County RCIS, and because species do not occupy all of their suitable habitat.

This RCIS's habitat models were developed to be generally consistent with the habitat models developed for the Habitat Plan's covered species; however, this RCIS's habitat models differ slightly from the Habitat Plan's habitat distribution models in land cover types used to represent habitat where there are differences between the land cover data (and names of land cover types) used by this RCIS and the Habitat Plan (see Table 2-3a and Table 2-3b for a comparison of land cover types used by this RCIS and the Habitat Plan). Other differences generally reflect minor refinements in this RCIS's habitat models. A comparison of the Habitat Plan model parameters and the Santa Clara County RCIS model parameters for species that are included both in this RCIS and the Habitat Plan is included in Appendix G, *Comparison of RCIS Species Habitat Models and Habitat Plan Habitat Models*.

Focal Species Locations

Documented occurrences of focal species within the RCIS area were used to visually evaluate and refine the habitat distribution models. The data used to identify locations of occurrence of focal species, and to inform the development of the focal species' habitat models come primarily from the CNDDB (California Department of Fish and Wildlife, California Natural Diversity Database 2019), with some additional data from the USGS's Biodiversity Information Serving Our Nation (BISON) database (U.S. Geological Survey 2016). In addition, occurrence data specific to the Habitat Plan (i.e., from a source other than CNDDB) were reviewed to identify suitable land cover types for the focal species' habitat models but were not included on the habitat distribution maps. These data include the following.

- Plant occurrence records from 2004 SCVWD surveys of their facilities (J. Hillman pers. comm., as cited in the Habitat Plan).
- Rare plant and special-status wildlife survey data from field work conducted in 2005 and 2006 east of San José on approximately 8,000 acre property owned at the time by United Technologies Corporation and now owned by the Santa Clara Valley Open Space Authority (as cited in the Habitat Plan).
- Plant occurrence records from the CNPS (K. Bryant pers. comm., 2006–2007 data, as cited in the Habitat Plan).

For CNDDB records, only occurrences presumed extant by CNDDB were used. Data that are reported to the CNDDB are done so with varied precision. Some occurrences are very well documented with explicit locations (e.g., GPS coordinates) while others are reported with more general location information. Precise occurrences are those that have sufficient information to be located on a standard USGS 7.5-minute quadrangle map, either at specific location or with an accuracy of 80 meters. General occurrences are those that have been documented in very general terms and include non-specific records (such as the boundary of a park where an occurrence is known to occur) or records with an accuracy of 0.1, 0.2, 0.4, 0.6, 0.8, or 1.0 mile. Precise occurrences were assumed to be extant unless they were on sites that have obviously been converted to other land uses and were used to verify habitat distribution models.

In addition, BISON data were filtered to use specific observations documented between 1977 and 2016. This filter was used to exclude non-specific, historic records from unauthenticated sources.

Precise CNDDB occurrences and specific BISON occurrences were used to inform the development of the focal species' habitat models by comparing the overlap between the models and occurrence data to assess how well the model represented the distribution of known occurrences. Occurrences that fell outside of a model's predicted habitat distribution were evaluated to determine whether they indicated flaws in the model or were an anomalous occurrence (e.g., the occurrence no longer reflects current conditions if the location of the occurrence has been developed). Anomalous points were retained but were not used to adjust the model. Aerial photographs were examined to assess the significance of extreme outliers. When a model did not adequately capture enough occurrences, the model was modified to better reflect the species' habitat relationships by modifying one or a few elements of the model (e.g., adding a land cover type to the model, increasing the slope or elevational range limits).

CNDDB Data Limitations

CNDDB records represent the best available statewide data but, are limited in their use for conservation planning. CNDDB data document presence only; the absence of an occurrence data point does not indicate that the species is not present. CNDDB records rely on field biologists to voluntarily submit information on the results of surveys and monitoring. As a result, the database is biased geographically towards areas where surveys have been conducted or survey efforts are greater (many areas have not been surveyed at all and this is not reflected in the database). The database may also be biased toward species that receive more survey effort. For example, there have been more surveys for California red-legged frog than other special-status amphibians because California red-legged frog is a listed species. Conspicuous diurnal species such as raptors receive greater survey effort than nocturnal species such as bats. Plants typically receive less survey effort than wildlife.

Model Uses and Limitations

The habitat distribution models are intended to be used only for planning purposes at the scale of the RCIS area. The use of these models by project proponents is voluntary. The models impose no regulatory requirements. If used for site planning, the models should be only used as a guide. All species' habitat and occurrences should be verified in the field. Occurrence data are incomplete and limited by where field surveys have been conducted. Some occurrence points may also be geographically general or inaccurate.

The precision of the habitat distribution models is limited by several factors, including minimum mapping units of the underlying land cover datasets. Areas of suitable habitat smaller than the mapping thresholds were not mapped and could therefore not be incorporated into the models. This constraint limited the degree of resolution of some habitat features potentially important to some species. This presented challenges for focal plant species, which are often associated with unmapped microhabitats such as swales, ditches, or rock outcrops smaller than the minimum mapping unit.

The habitat distribution models were limited to distinguishing habitat uses based on key life history requirements such as breeding, foraging, or dispersal that are associated with land cover types. The land cover data do not allow further distinctions of habitat quality on a regional scale. To account for these limitations, conservative estimates of habitat parameters were used. This approach tends to overestimate the actual extent of suitable habitat but was used to minimize eliminating potentially suitable habitat where conservation investments and mitigation actions could occur.

2.2.5.3 Focal Species Profiles

The following species profiles summarize the regulatory status, distribution in the RCIS area, and habitat requirements for the focal species. The information provided in the species profiles are intended to be sufficient to develop effective and practical conservation goals, objectives, and actions for this Santa Clara County RCIS. The profiles are not intended to provide a comprehensive summary of the biology and ecology of each focal species. A summary of the historic, current, and projected future pressures and stressors in the RCIS area, including climate change vulnerability, on the focal species, is provided separately in Section 2.4, *Pressures and Stressors on Focal Species and other Conservation Elements*.

Central California Coast Steelhead

Regulatory Status

- **State:** None
- **Federal:** Threatened
- **Critical Habitat:** Final critical habitat for the Central California Coast steelhead *distinct population segment*[15] (DPS) designated by National Marine Fisheries Service on September 2, 2005 (National Marine Fisheries Service 2005). Where designated, critical habitat includes the entire width of the stream channel defined by the ordinary high-water line (as defined by the Corps in 33 Code of Federal Regulations [CFR] 329.11) or the bankfull elevation where the ordinary high-water line has not been defined.
- **Recovery Planning:** Recovery plan for Central California Coast steelhead approved in 2016 as part of the *Coastal Multispecies Recovery Plan*, including California Coastal Chinook Salmon, Northern California steelhead, and Central California Coast steelhead (National Marine Fisheries Service 2016a).

Distribution

General

The Central California Coast steelhead DPS comprises winter-run steelhead populations that spawn and rear from the Russian River in Sonoma County south to Aptos Creek in Santa Cruz County, and includes tributaries to the San Francisco/San Pablo Bay system, and stretches south to Aptos Creek

[15] A distinct population segment is "a subdivision of a vertebrate species that is treated as a species for purposes of listing under the Endangered Species Act (ESA)" (National Marine Fisheries Service 2016).

in Santa Cruz County (National Marine Fisheries Service 2016a). Due to significant impacts from urban infrastructure and agricultural development, the range and habitat of this species is severely limited and degraded (Moyle 2002, Leidy et al. 2005, Moyle et al. 2015, National Marine Fisheries Service 2016b).

Within the RCIS Area

Central California Coast DPS steelhead occurs in Guadalupe River, Stevens Creek, and Coyote Creek stream system upstream to Anderson Dam and Reservoir, near the City of Morgan Hill (Leidy et al. 2005, National Marine Fisheries Service 2016a) (Figure H-1, Appendix H, *Focal Species Habitat Models*).

Life History

Steelhead have a complex life history and may follow a variety of life-history patterns, including some that may exhibit anadromy (i.e., migrate to the ocean to mature as adults) or freshwater residency (i.e., are not migratory and reside their entire life in fresh water). The relationship between these two life-history forms when they occur together is poorly understood. Intermediate life-history patterns also exist and include fish that migrate within the stream (potamodromous), fish that migrate only as far as estuarine habitat, and fish that migrate to nearshore ocean areas. These life-history patterns do not appear to be genetically distinct, and individuals exhibiting different life-history patterns have been observed interbreeding (Shapovalov and Taft 1954).

Adult steelhead in this DPS leave the ocean and enter fresh water to spawn when winter rains have been sufficient to raise stream flows and, for many coastal streams, breach the sandbars that form at the mouths during the summer. Increased streamflow during runoff events appears to provide adults with cues that stimulate migration and allows improved conditions for fish to pass obstructions and shallow areas on their way upstream. The season for upstream migration of Central California Coast steelhead adults lasts from late October through the end of May, but typically the bulk of migration occurs between mid-December and mid-April. The exact timing and rate of migration depend on several factors, including stream discharge, water temperature, the maturity of the fish, the behavior of the population, and possibly other factors.

Central California coast steelhead typically mature after 1 or 2 years in the ocean, with males commonly maturing in 1 year and females in 2 years. Steelhead fecundity is relatively high. A 22-inch female produces around 4,800 eggs, and a 30-inch fish produces an average of 9,000 to 10,000 eggs (Shapovalov and Taft 1954). By comparison, a 12-inch non-anadromous rainbow trout (*Oncorhynchus mykiss*) may produce closer to 1,000 eggs. Central California Coast steelhead spawn primarily from December through March or early April. Steelhead may survive spawning, return to the ocean, and return to spawn again. Repeat spawners may make up as much as 30% of the run, but typically only a relatively low percentage survive to spawn more than twice.

Ecological Requirements

Smith (1999) describes two distinct habitat types used by Central California Coast steelhead and resident trout. The primary habitat consists of shaded pools of small, cool, low flow upstream reaches typical of the original steelhead habitat in the region. In addition, they use warm water habitats below some dams or pipeline outfalls, where summer releases provide high summer flows and fast water feeding habitat.

Trout metabolic rate, and thus food demand increases with temperature. Trout rely heavily on insect drift for food, and drift increases with flow velocity. Under conditions of low flow and high temperatures, trout have increasing difficulty obtaining sufficient food to meet metabolic costs. Smith and Li (1983) found that in Uvas Creek, a relatively warm stream with summer maximum water temperatures of 73°F to 77°F, steelhead move into higher velocity microhabitats in riffles and runs where sufficient food can be obtained. These habitats are created by summer releases from an upstream reservoir.

Steelhead select spawning sites with gravel substrate and sufficient flow velocity to maintain circulation through the gravel, providing a clean, well-oxygenated environment for incubating eggs. Preferred flow velocity is in the range of 1 to 3 feet per second (Raleigh et al 1986). Preferred gravel substrate is in the range of 0.25 to 4 inches in diameter for steelhead (Bjornn and Reiser 1991).

After emergence from the gravel, fry inhabit low velocity areas along the stream margins. As they feed and grow, they gradually move to deeper and faster water. In central California streams, steelhead typically rear for one or two years. Parr larger than 6 inches are more frequently found in deeper waters where low velocity areas are in close proximity to higher velocity areas and cover is provided by boulders, undercut banks, logs, or other objects. Heads of pools generally provide classic conditions for older trout. Trout can inhabit very small streams, particularly in coastal areas.

Food and cover are key factors for rearing steelhead (Mason and Chapman 1965 , Shapovalov and Taft 1954). During the high flows, reduced food abundance, and lower temperatures occurring in winter, steelhead may move down into the substrate or find other cover. Backwater habitat, small tributaries, or other low velocity areas may also be important winter habitat. Juvenile steelhead feed primarily on aquatic invertebrates and terrestrial insects. These fish typically take up position in the stream current and capture drifting organisms or rise to the surface to take prey items that have fallen into the stream. Active invertebrates may be taken off substrates, and occasionally small fish and snails are eaten. Feeding may occur at any time but often peaks at dawn and dusk. Trout are primarily visual feeders, so high turbidity can reduce feeding activity. Feeding activity also can be reduced during winter when temperature and activity levels are lower.

Upper lethal temperatures for adult Pacific salmonids are in the range of 75°F to 77°F for continuous long-term exposure (Brett et al. 1982). Preferred temperatures for steelhead parr range from 54°F to 64°F, although optimum growth rates may occur at slightly higher temperatures if food is abundant. Temperatures also influence the smoltification process. In some studies, steelhead have exhibited decreased migratory behavior and decreased seawater survival at temperature in excess of 55°F (Zaugg and Wagner 1973, Adams et al. 1975).

Modeled Habitat Distribution in the RCIS Area

This RCIS uses a map from the Habitat Plan (ICF International 2012), and updated for this RCIS, that characterizes the stream reaches in the RCIS area. The following methods used to develop the fish habitat assemblage map, and description of the fish assemblages (hereafter referred to as fish habitats) is modified slightly from Appendix L, *Fish Habitat Assemblage Data*, from the Habitat Plan.

To characterize the stream reaches for the Habitat Plan, a map was developed of native and non-native fish assemblages and aquatic habitat types throughout the major stream systems in Santa Clara County. Data were first developed to support SCVWD's Stream Maintenance Program. Dr. Jerry Smith of San José State University updated the map in July 2006 for the Science Advisors report of the Habitat Plan to reflect barrier removal and sampling results that occurred in the intervening years since the original map was created (Spencer et al. 2006). The map was then further revised and updated in 2007 by Dr. Smith and Jae Abel, a senior fisheries biologist at SCVWD. Jae Abel then adapted the map so that it corresponded to the new GIS stream data layer developed for the Habitat Plan's study area (Santa Clara County) by SCVWD in early 2007. It was this version of the map that was used in the Habitat Plan. The most recent updates to the map were provided by Dr. Smith (pers. comm. 2016) which included modifications to the characterization of the South Fork of Pacheco Creek, Hagerman Canyon, the right bank tributary to Cedar Creek (tributary to Pacheco Creek), and Packwood Creek, a tributary to Anderson Reservoir (Coyote Creek system).

The stream categories emphasize habitat conditions for, and distribution of, steelhead trout and Chinook salmon. Ten categories of fish assemblages and aquatic habitat types were defined for the version used in the Habitat Plan and are presented in this RCIS. These habitat categories are described as follows.

Estuarine

Lowermost reaches of streams where conditions are saline and tidal (such as on Guadalupe Slough, lower Guadalupe River and Lower Coyote Creek).

Cold Steelhead and Cold Steelhead-Extent Unknown

A small portion of this habitat is on undammed tributaries, such as Tar, Bodfish, Little Arthur creeks (tributaries to Uvas Creek), Cedar Creek (tributary to Pacheco Creek) and Arroyo Aguague (tributary to Upper Penitencia Creek). However, most of the remaining steelhead habitat in the RCIS area is downstream of reservoirs on Los Gatos, Guadalupe, Alamitos, Arroyo Calero, Coyote, Upper Penitencia, Chesbro, Uvas, and Pacheco creeks. The mapped stream segments in this category normally provide an appropriate mix of: 1) relatively cool water (rarely above 71-75 °F [22-24°C]); 2) high stream flow to provide fast-water feeding habitat for steelhead; 3) relatively clean, coarse substrate for insect production; and 4) sufficient sun and water clarity to provide for algal growth (as a base of the food chain) and to allow steelhead to feed on drifting insects in fast water (Smith 1982, Smith and Li 1983). Much of the stream habitat in this category (downstream of reservoirs) is warmer than typical trout habitat, but the high summer stream flows allow steelhead to sufficiently feed on drifting insects to cope with the metabolic costs of the warmer water (Smith and Li 1983). Steelhead downstream of reservoirs in summer are found almost exclusively in fast-water habitat in riffles, runs, and heads of pools and often reach smolt size in one summer (Smith 1982, Smith and Li 1983). A variety of native fish species are usually present in this habitat and downstream of reservoirs, includes Pacific lamprey.

Cold Trout and Cold Trout-Extent Unknown

These are perennial habitats upstream of reservoirs where conditions are suitably cool enough to support resident rainbow trout, often with California roach (*Lavinia symmetricus*), Sacramento sucker (*Catostomus occidentalis*), and riffle sculpin (*Cottus gulosus*) present. Prior to reservoir construction, most of these habitats supported steelhead and possibly some salmon (*Oncorhynchus spp.*). Pacific lamprey is another anadromous species of concern that is presumed absent from this habitat upstream of the reservoirs. However, lampreys are able to ascend the spillway at Uvas Reservoir (Smith 1982) to utilize upper Uvas Creek. Resident trout are also present above natural and smaller man-made barriers on Smith, Bodfish, Little Arthur, and Upper Penitencia creeks.

Warm Potential Trout/Steelhead

These habitats are usually further downstream of reservoirs than the cold steelhead reach and are often deficient in one or more of the four factors listed above. Higher water temperatures increase steelhead food demands, often sufficiently to starve the fish. Variable year-to-year stream flows, or reduced stream flows due to percolation, reduce the fast water steelhead feeding habitat needed to meet the metabolic demands of high temperature. Insect production is low due to poor substrate, turbidity, or low stream flow. Feeding is reduced by heavy shading or high turbidity. Management for increased stream flows or reduced water temperatures downstream of reservoirs in this zone may make the habitat more regularly suitable for steelhead. Usually, warm-water native fish tend to dominate in this habitat type, with any juvenile steelhead scarce or strongly restricted to suitable fast-water feeding habitat.

Warm Native

These habitats are dominated by native warm-water fishes, often including Sacramento sucker, hitch or roach, Sacramento pikeminnow (*Ptychocheilus grandis*), threespine stickleback (*Gasterosteus aculeatus*), and prickly sculpin (*Cottus asper*). Most of the mapped reaches support at least 3-4 of the above species as the minnow-sucker association of Smith (1982). North Fork Pacheco Creek (above the reservoir) and Upper Silver Creek (tributary to Coyote Creek) contain roach associations, dominated by California roach, with relatively scarce stickleback (Upper Silver Creek) or Sacramento Sucker and prickly sculpin (North Fork Pacheco Creek). The third potential native warm-water fish community is the Sacramento perch (*Archoplites interruptus*)/Sacramento blackfish (*Orthodon microlepidotus*) community (Smith 1982). This low-gradient stream association is absent from the RCIS area, and from the rest of California, because of the scarcity of Sacramento perch and the dominance of even high-quality downstream habitats by introduced fishes, including sunfishes (*Lepomis spp.*) and common carp (*Cyprinus carpio*). Foothill yellow-legged frog and California red-legged frog can occur in relatively undisturbed reaches of the warm native, cold steelhead, and cold trout zones.

Mixed Native – Salmonids

Chinook salmon spawn in Coyote Creek, the Guadalupe River, and its tributaries. Some of the reaches they use are mapped as "cold steelhead" or "warm potential trout/steelhead," indicating the higher quality year-round habitat that steelhead are potentially able to use for rearing. However, since Chinook spawn in early winter and juveniles migrate to the ocean in their first spring, Chinook are able to use habitats that turn very warm or have low water quality in summer. Most of these habitats also have a fish community composed of a mixture of native species (Sacramento sucker and hitch) and introduced species (carp and red shiner [*Cyprinella lutrensis*]).

Mixed Native

These warm-water habitats contain a mixture of native and introduced species. This includes lower portions of Coyote and Llagas creeks, the Guadalupe River, the Pajaro River, and most pond and reservoir habitats. Native tule perch (*Hysterocarpus traski*) have apparently been reintroduced to Coyote Creek via the pipeline from San Luis Reservoir; they are present in the on-channel Ogier Ponds.

Managed Reservoir

These artificial habitats provide warm-water lake conditions, a habitat type originally rare in the RCIS area. These habitats primarily include sport fishes and other warm-water introduced species such as green sunfish (*Lepomis cyanellus*), redear sunfish (*Lepomis microlophus*), pumpkinseed sunfish (*Lepomis gibbosus*), crappie (*Pomoxis spp*.), bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), bullhead (*Ameiurus spp*.), white catfish (*Ameiurus catus*), and channel catfish (*Ictalurus punctatus*). Forage for the predatory fishes has usually included introduced threadfin shad (*Dorosoma petenense*), inland silverside (*Menidia beryllina*), golden shiner (*Notemigonus crysoleucas*), and crayfish. Some native fishes, including Sacramento sucker and Sacramento blackfish, can be abundant in the new habitats, but most native species do poorly when facing competition and predation from the introduced fishes.

Fish Scarce

These habitats are normally dry during summer and fall. However, they may serve as migration routes for steelhead and other fishes or as reproductive habitat for rapidly developing amphibians such as Pacific treefrog (*Pseudacris regilla*) or western toad (*Anaxyrus boreas halophilus*).

No Data

Fish species present are unknown but may have fisheries values.

No Data/Probably No Value

Fish species present are unknown, but because of location or habitat conditions the reach is unlikely to have habitat value for fish. A majority of the no data or no data/probably no value stream reaches are seasonal streams, extreme headwaters, or highly modified urban channels.

Model Results

Figure H-1, Appendix H, *Focal Species Habitat Models*, displays the results of the modeled habitat for the Central California Coast DPS steelhead. The majority of suitable “cold steelhead” habitat is located along the western edge of the RCIS area in the Santa Cruz Mountains.

South-Central California Coast Steelhead

Regulatory Status

- **State:** N/A
- **Federal:** Threatened
- **Critical Habitat:** Final critical habitat for the South-Central California Coast steelhead DPS designated by National Marine Fisheries Service on September 2, 2005 (National Marine Fisheries Service 2005). Where designated, critical habitat includes the entire width of the stream channel defined by the ordinary high-water line (as defined by the Corps in 33 CFR 329.11) or the bankfull elevation where the ordinary high-water line has not been defined.
- **Recovery Planning:** *South-Central California Coast Steelhead Recovery Plan* approved in 2013 (National Marine Fisheries Service 2013).

Distribution

General

Historically, the South-Central California Coast steelhead ranged from creeks in the Aptos Hills south to San Luis Obispo. Due to significant impacts from urban infrastructure and agricultural development, the range and habitat of this species is severely limited and degraded (National Marine Fisheries Service 2013).

Within the RCIS Area

The South-Central California Coast DPS steelhead has potential to occur in the RCIS area, particularly in the Pajaro River system, including Pescadero Creek, Uvas and Bodfish Creeks near SR 152, Little Arthur Creek near Mount Madonna, Tar Creek near Gilroy, and Pacheco Creek (National Marine Fisheries Service 2013) (Figure H-1, Appendix H, *Focal Species Habitat Models*).

Life History

Only winter steelhead are found in the South-Central California Coast steelhead distinct population segment. Migration and spawn timing are similar to Central California steelhead. Life history traits for South-Central Coast California steelhead are similar to those described for Central California Coast steelhead. Steelhead along the Central California Coast enter freshwater to spawn when winter rains have been sufficient to raise streamflows and breach the sandbars that form at the mouths of many streams during the summer. Increased streamflow during runoff events also appears to provide cues that stimulate migration and allow better conditions for fish to pass obstructions and shallow areas on their way upstream (Moyle 2002). The season for upstream migration of Central California Coast steelhead adults lasts from late October through the end of May, but typically the bulk of migration occurs between mid-December and mid-April (Shapovalov and Taft 1954).

Ecological Requirements

The South-Central California Coast steelhead have habitat requirements similar to the Central Coast DPS (California Department of Fish and Wildlife 2015, Moyle et al. 2015) (see *Central California Coast Steelhead [Oncorhynchus mykiss], Ecological Requirements* above).

Modeled Habitat Distribution in the RCIS Area

The steam habitat types for South-Central California Coast Steelhead DPS and descriptions of stream habitat types are the same as the model parameters for Central California Coast Steelhead DPS (see *Central California Coast Steelhead [Oncorhynchus mykiss], Model Habitat Distribution in the RCIS Area* above).

Model Results

Figure H-1, Appendix H, *Focal Species Habitat Models*, displays the results of the modeled habitat for the South-Central California Coast DPS steelhead. The majority of suitable cold steelhead habitat is located along the western edge of the RCIS area in the Santa Cruz Mountains.

California Tiger Salamander

Regulatory Status

- **State:** Threatened
- **Federal:** Threatened
- **Critical Habitat:** Final critical habitat designated for the California Tiger Salamander, Central Population (U.S. Fish and Wildlife Service 2005a).
- **Recovery Planning:** *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander* (Ambystoma californiense) (U.S. Fish and Wildlife Service 2017).

Distribution

General

California tiger salamander is distributed throughout grasslands and low foothill regions, up to 3,940 feet in elevation, though most are known from elevations below 1,500 feet (Shaffer et al. 2013). The Central California DPS of this species is distributed along the foothills of the Central Valley and Inner Coast Range from Sacramento and Yolo Counties in the north, to San Luis Obispo, Kern, and Tulare Counties in the south (U.S. Fish and Wildlife Service 2017). There a total of 1,196 CNDDB occurrences of California tiger salamander within its range (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

California tiger salamander are found in aquatic and upland habitats in scattered locations throughout the RCIS area on both sides of U.S. 101 along Coyote Valley. This species is not present in the immediate northeastern and northwestern corners of the RCIS area. Of the 1,196 CNDDB occurrences, 166 (14%) are located within the RCIS area (Figure H-2, Appendix H, *Focal Species Habitat Models*).

Life History

California tiger salamander uses aquatic and terrestrial habitats at different stages in their life cycle. Adults emerge from underground burrows to breed, but only for brief periods during the year. Adult California tiger salamander migrate during rainy nights between November and April, although migrating adults have been observed as early as October and as late as May (Trenham et al. 2001). Eggs are laid singly or in clumps on submerged and emergent vegetation and on submerged debris in shallow water. In ponds without vegetation, females lay eggs on objects on the pond bottom (Stebbins 1972, Shaffer and Fisher 1991, Barry and Shaffer 1994, Jennings and Hayes 1994). After breeding, adults leave breeding ponds and return to their refugia (e.g., small mammal burrows). After approximately two weeks, salamander eggs begin to hatch into larvae. Once larvae reach a minimum body size they metamorphose into terrestrial juvenile salamanders. The amount of time that salamanders spend in the larval stage and the size of individuals at the time of metamorphosis is dependent on many factors. Larvae in small ponds develop faster, while larvae in larger ponds that retain water for a longer period are larger at time of metamorphosis. At a minimum, salamanders require ten weeks living in ponded water to complete metamorphosis but in general development is completed in 3–6 months (Petranka 1998). If a pond dries prior to metamorphosis, the larvae will desiccate and die (U.S. Fish and Wildlife Service 2000). Juveniles disperse from aquatic breeding sites to upland habitats after metamorphosis (Storer 1925, Holland et al. 1990).

Aquatic larvae feed on algae, small crustaceans, and small mosquito larvae for about six weeks after hatching (U.S. Fish and Wildlife Service 2000). Larger larvae feed on zooplankton, amphipods, mollusks, and smaller tadpoles of Pacific treefrogs, California red-legged frogs, and western toads (Zeiner et al. 1988, U.S. Fish and Wildlife Service 2000). Adults eat earthworms, snails, insects, fish, and small mammals (Stebbins 1972).

Ecological Requirements

California tiger salamander breeds and lays their eggs primarily in vernal pools and other ephemeral ponds that fill in winter and often dry out by summer (Loredo et al. 1996); they sometimes use ephemeral and permanent human-made ponds (e.g., stock ponds), reservoirs, and small lakes that do not support predatory fish or bullfrogs (*Lithobates catesbeianus*) (Stebbins 1972, U.S. Fish and Wildlife Service 2017). Streams in riparian forests or woodlands are rarely used for reproduction, but California tiger salamanders have been reported in ditches with seasonal wetland habitat and in slow-flowing swales and creeks with riparian habitat (Alvarez et al. 2013).

California tiger salamander is particularly sensitive to the duration of ponding in aquatic breeding sites. Because tiger salamanders have a long developmental period, the longest lasting seasonal ponds or vernal pools are the most suitable type of breeding habitat for this species; these pools are also typically the largest in size (Jennings and Hayes 1994). A minimum of 10 weeks are required to complete metamorphosis (Feaver 1971); however, four to five months is usually required (Shaffer and Trenham 2005). Aquatic sites suitable for breeding should pond or retain water for a minimum of 10 weeks. Optimum breeding sites are ephemeral and should dry down for at least 30 days before the rain being in the fall (around August or September) to prevent non-native predators from establishing (U.S. Fish and Wildlife Service 2017).

The suitability of California tiger salamander habitat is proportional to the abundance of upland refuge sites near aquatic breeding sites. California tiger salamanders primarily use California ground squirrel burrows as refuge sites (Loredo et al. 1996, Trenham 2001); Botta's pocket gopher burrows are also frequently used (Barry and Shaffer 1994, Jennings and Hayes 1994), as well as man-made structures. California tiger salamanders also use logs, piles of lumber, and shrink-swell cracks in the ground for cover (Holland et al. 1990). The presence and abundance of tiger salamanders in many areas are limited by the number of small-mammal burrows available; salamanders are typically absent from areas that appear suitable other than their lack of burrows. Loredo et al. (1996) emphasized the importance of California ground squirrel burrows as refugia for California tiger salamanders, and suggested that a commensal relationship exists between California tiger salamander and California ground squirrel in which tiger salamanders benefit from the burrowing activities of squirrels.

The proximity of refuge sites to aquatic breeding sites also affects the suitability of salamander habitat. California tiger salamanders are known to travel distances up to 1.5 miles from breeding sites (Searcy and Shaffer 2011) and primarily occupy upland habitat within 1.16 mile from their breeding sites (Searcy and Shaffer 2011). Based on capture data from a single-season study at Olcott Lake in Jepson Prairie Preserve (Solano County), Trenham and Shaffer (2005) estimated that 95 percent of adult and subadult tiger salamanders occurred within approximately 0.4 mile of the breeding pond. Their model also suggests that 85 percent of subadults were concentrated between 0.1 and 0.4 mile from the pond. During a 5-year study in Contra Costa County, however, Orloff

(2011) recorded the majority of captured salamanders at least 0.5 mile from the nearest breeding pond. Therefore, although salamanders may migrate up to 1.54 miles from breeding sites, migration distances are likely to be less in areas supporting refugia closer to breeding sites. Also, habitat complexes that include upland refugia relatively close to breeding sites are considered more suitable because predation risk and physiological stress in California tiger salamanders probably increases with migration distance.

The U.S. Fish and Wildlife Service (2017) recommends a minimum preserve size of 3,398 acres with at least four ponds, and that the ponds should have variation in depth and ponding duration so that at least some fill during different environmental conditions (e.g., low annual rainfall). The U.S. Fish and Wildlife Service determined the minimum preserve size based on the 1.3-mile maximum dispersal distance (i.e., a preserve with a radius of 1.3 miles is 3,398 acres). Four ponds are recommended to provide the necessary amount of redundancy to ensure long-term habitat availability (U.S. Fish and Wildlife Service 2017).

Modeled Habitat Distribution in the RCIS Area

Model Parameters

Modeled potential breeding habitat within the RCIS area includes all wetland and pond types, (excluding seeps and reservoirs) within grassland, woodland, riparian woodland, conifer forest, cultivated agriculture, and shrubland land cover types up to 3,940 feet elevation. Modeled potential upland habitat extends 1.3 miles around all areas designated as breeding habitat, excluding baylands and urban land cover types. In addition to the potential breeding and upland habitat, occupied habitat was designated using all CNDDB records with an extant record, indicating that the species is present at the location. This occupied habitat buffer is similar to the methodology used to display occupied habitat by buffering 1.3 miles from known extant occurrences in the recovery plan for the species (U.S. Fish and Wildlife Service 2017).

Rationale

Habitat for California tiger salamander was modeled using parameters similar to those used in the Habitat Plan (ICF International 2012).

California tiger salamanders require two major habitat components: aquatic breeding sites and upland or refuge sites. California tiger salamanders inhabit valley and foothill grasslands and the grassy understory of open woodlands, usually within 1.3 miles of water and a maximum elevation of 3,940 feet (U.S. Fish and Wildlife Service 2017). California tiger salamander is terrestrial as an adult and spends most of its time underground in subterranean refugia. For a brief period each year, adults emerge from underground to breed and lay their eggs primarily in ephemeral wetlands and ponds that fill in winter and often dry out by summer (Loredo et al. 1996); they sometimes use permanent human-made ponds (e.g., stock ponds), reservoirs, and small lakes that do not support predatory fish or bullfrogs (Stebbins 1972, Zeiner et al. 1988) and streams are rarely used for reproduction.

Model Results

Figure H-2, Appendix H, *Focal Species Habitat Models*, displays modeled habitat for California tiger salamander. The model output identifies potential breeding habitat, potential upland habitat, and occupied habitat based on known records and the dispersal distances the species is known to travel.

Suitable habitat is modeled throughout the undeveloped lands in the RCIS area, primarily due to the even distribution of aquatic habitat in the non-urban portions of the RCIS area. Aquatic breeding habitat in the RCIS area may be under-mapped, due to the seasonal nature of some aquatic breeding habitat. Site-specific conditions should be surveyed to determine whether habitats on the site would support California tiger salamander.

Foothill Yellow-legged Frog

Regulatory Status

- **State:** Candidate
- **Federal:** Under review. Petitioned action may be warranted
- **Critical Habitat:** N/A
- **Recovery Planning:** N/A

Distribution

General

Foothill yellow-legged frog is found in low velocity permanent and ephemeral streams throughout Northern California, west of the Cascades and Sierra Nevada mountain ranges and south to Kern County at elevations from sea level to 4,500 feet (Stebbins 2003). It is estimated that the species currently occupies only 45% of its historical range in California (Thomson et al. 2016). Larger populations are still found from the Oregon border south to Sonoma County. Populations are scattered at remnant locations from Sonoma County south to the Salinas River watershed, coastal Big Sur, San Luis Obispo watershed, and the foothills of the Cascades and Sierra Nevada (Jennings and Hayes 1994). There are 2,381 CNDDB occurrences within its range (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

Foothill yellow-legged frog is found in the foothill areas of eastern Santa Clara County and the Santa Cruz Mountains in western Santa Clara County, generally upstream of reservoirs. Of the 2,381 CNDDB occurrences, 48 (3%) are located within the RCIS area (Figure H-3, Appendix H, *Focal Species Habitat Models*).

Life History

Foothill yellow-legged frog is a medium sized frog 1.5 to 3.2 inches long from snout to vent with yellow undersides of the rear legs and lower abdomen (Stebbins and McGinnis 2012). They occur in perennial rocky streams and rivers with sunny banks and deep shaded pools and can be found in smaller tributaries and nearby uplands during high flow events (Bourque 2008, Leidy et al. 2009, Thomson et al. 2016). Masses of eggs are attached to gravel or rocks in moving water near stream margins (Zeiner et al. 1988). Foothill yellow-legged frogs in California generally breed between March and early June (Storer 1925, Grinnell et al. 1930, Wright and Wright 1949, Jennings and Hayes 1994).

Breeding and oviposition occur at margins in relatively wide, shallow channel sections, where microhabitats experience decreased variation of flows (Thomson et al. 2016). In a study on the Eel River along the northern coast of California, foothill yellow-legged frogs chose sites to lay eggs and timed egg laying to avoid fluctuations in river stage and current velocity associated with changes in river discharge (Kupferberg 1996). This suggests that stable flow and current velocities are important to create suitable reproductive sites for foothill yellow-legged frogs. After oviposition, a minimum of approximately fifteen weeks is required to reach metamorphosis, which typically occurs between July and September (Storer 1925, Jennings 1988). Larvae reach sexual maturity in one to two years in males and two to three years in females (Thomson et al. 2016).

Diet of the larval stage appears to be herbivorous with a preference for algae with epiphytic diatoms, while metamorphs and adults are known to ingest terrestrial and aquatic insects (Thomson et al. 2016).

Radiotelemetry studies have uncovered insights into general terrestrial movements (Thomson et al. 2016). In several studies, travel rates range from 100 to 1,386 meters/day (328 to 4,547 feet/day) with females moving father than males. The average distance from water was less than 3 meters (10 feet) in all seasons, although adults occasionally used upland habitat up to 40 meters (approximately 131 feet) from streams for winter refugia to avoid floods following large rain events (Bourque 2008, Thomson et al. 2016).

Ecological Requirements

Foothill yellow-legged frog requires shallow, flowing water in small to moderate-sized streams with at least some cobble-sized substrate (Jennings 1988, Bourque 2008, Thomson et al. 2016). This habitat is believed to favor oviposition (Storer 1925, Fitch 1938, Zweifel 1955) and refuge habitat for larvae and postmetamorphs (Hayes and Jennings 1988, Jennings 1988). Foothill yellow-legged frogs are usually absent from habitats where introduced aquatic predators, such as various fishes and bullfrogs, are present (Hayes and Jennings 1988, Kupferberg 1996, Thomson et al. 2016). Typical breeding and egg deposition occur in stream habitat that has little to no slope (U.S. Forest Service 2011). The species deposits its egg masses on the downstream side of cobbles and boulders over which a relatively thin, gentle flow of water exists (Storer 1925, Fitch 1936, Zweifel 1955, Kupferberg 1996). The timing of oviposition typically follows the period of high-flow discharge from winter rainfall and snowmelt (Jennings and Hayes 1994, Kupferberg 1996). The embryos have a critical thermal maximum temperature of 79°F (Zweifel 1955).

A diversity of overstory habitat types are suitable for foothill yellow-legged frog for breeding, foraging, the non-breeding active season, and upland refugia, including hardwood forest, conifer forest, chaparral, riparian, and wet meadows. Foothill yellow-legged frogs favor habitat with more than 20% shading, but are excluded from areas with too much cover (greater than 90%), likely due to a lack of basking sites (Hayes and Jennings 1988, Jennings 1988). Foothill yellow-legged frogs prefer low to moderate stream gradients, particularly for breeding (Smith pers. comm. 2017, in Hayes et al. 2016), but during the non-breeding season juvenile and adult frogs may migrate to higher gradient streams.

Modeled Habitat Distribution in the RCIS Area

Model Parameters

Model parameters were developed to capture habitat associations for breeding and foraging habitat and low-use habitat. Breeding and foraging habitat and low-use habitat also include non-breeding active season habitat and upland habitat.

Breeding and foraging habitat includes low-gradient streams (0 to 11% slope) and streams not regulated by a dam (i.e., upstream of dams), in riparian forest/scrub, grassland, oak woodland, and conifer woodland land cover types. A short length of stream downstream of the Guadalupe Reservoir was included as breeding and foraging habitat, as this is the only location downstream of reservoirs with altered and variable stream flow pattern supporting foothill-yellow legged frog (J. Smith, pers. comm. 2017).

Foothill yellow-legged frog typically uses streams with slopes of lower gradient (e.g. < 6.5%) (Kupferberg 1996, Ibis Environmental Inc. 2003), and the Habitat Plan (ICF International 2012) defines breeding and foraging habitat as streams with 0-4% slope. Sections of streams with low gradient slopes were identified as potential breeding and foraging habitat. Initially, NHDPlus Version 2 (McKay et al. 2012) data were used to identify streams with gradients of 0-4% to characterize breeding and foraging habitat. Using this range of slope, many stream lengths known to be occupied by foothill yellow-legged frog were not selected as breeding habitat. The range of slope had to be expanded to 0-11% to capture occupied stream lengths. The use of apparently higher-slope streams to identify breeding and foraging habitat is likely an artifact of the slope data (e.g., inaccuracies), rather than a true reflection of the slopes of streams used by foothill-yellow legged frog for breeding and foraging.

The Habitat Plan identifies moderate gradient streams (4-11% slope) as low-use habitat. Because the RCIS slope data appear to overestimate the slopes of streams, the streams identified as low-use by the Habitat Plan were overlaid onto the RCIS stream layer to identify a range of slope in the RCIS slope data that characterizes streams defined as low-use by the Habitat Plan. This range of slope (11-18%) was then applied to streams outside the Habitat Plan area to define low-use streams for the entire RCIS area.

Both breeding and foraging habitat and low-use habitat include a 165-foot buffer around rivers and streams (Bourque 2008) associated with the following communities: conifer forests, woodlands, riparian woodlands, and shrublands. This buffer includes surrounding upland areas that could be utilized for winter refugia.

Rationale

Habitat for foothill yellow-legged frog was modeled using parameters similar to those used in the Habitat Plan (ICF International 2012).

Foothill yellow-legged frogs are stream-dwelling amphibians that require shallow, flowing water, in perennial streams containing riffles with cobble-sized or larger substrate, typically with low gradients (Hayes and Jennings 1988, Jennings 1988, Jennings and Hayes 1994, H.T. Harvey and Associates 1999, U.S. Forest Service 2011, Thomson et al. 2016). The species has been documented up to 165 feet from water (Zeiner et al. 1988). A buffer of 165-feet around all breeding and foraging habitat was considered upland habitat. By including streams that haven't had occupancy confirmed, the model compensates for under-surveyed areas. Although low-use habitat (moderate gradient streams or rivers) may not support the species and likely provide fewer conservation opportunities for this species, those areas were retained in the model because occurrences have been documented in such habitat (ICF International 2012).

Model Results

Figure H-3, Appendix H, *Focal Species Habitat Models*, displays modeled habitat for foothill yellow-legged frog. The model identifies breeding/foraging habitat and low-use habitat. Breeding/ foraging habitat are those areas most likely to support breeding activities typically found in wider, slow-moving sections of rivers and streams with boulder, cobble, and gravel deposits associated with low and moderate gradient slopes. Low-use habitat captures segments of streams that would most likely be used for movement between suitable breeding habitats in the same watershed. Due to the fluctuation in flow rates in RCIS area rivers and streams, breeding and foraging and low-use habitats may shift locations within and between years. Site-specific conditions should be surveyed to determine whether habitats on a site would support foothill yellow-legged frog.

California red-legged Frog

Regulatory Status

- **State:** Species of Special Concern
- **Federal:** Threatened
- **Critical Habitat:** Final revised critical habitat designation for the California red-legged frog (U.S. Fish and Wildlife Service 2010a).
- **Recovery Planning:** *Recovery Plan for the California Red-legged Frog* (Rana aurora draytonii) (U.S. Fish and Wildlife Service 2002).

Distribution

General

The California red-legged frog was historically found along the coast and coastal mountain ranges of California from Marin County to San Diego County and in the Sierra Nevada from Tehama County to Fresno County (Thomson et al. 2016). Currently, populations are known from the San Francisco Bay Area and Coast Ranges, in addition to declining populations in the Transverse and Peninsular Ranges, though they are absent from a large portion of their range. Very few populations are now known from Ventura, Los Angeles, and Riverside Counties (Thomson et al. 2016). There are 1,527 CNDDB occurrences within the species' range (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

California red-legged frog occurs throughout the RCIS area, with critical habitat encompassing most of the eastern half of the RCIS area (U.S. Fish and Wildlife Service 2010a). Scattered occurrences are located throughout the open space on the east and west side of the Santa Clara Valley, but are clustered in the vicinity of Henry W. Coe State Park, Anderson Lake, and in the vicinity of Mount Hamilton. Of the 1,527 known occurrences, 199 (13%) occur in the RCIS area, with the majority of occurrences within critical habitat (California Department of Fish and Wildlife, California Natural Diversity Database 2019) (Figure H-4, Appendix H, *Focal Species Habitat Models*).

Life History

California red-legged frog is a medium sized frog 1.75 to 5.25 inches long, from snout to vent, with reddish undersides of hind legs and lower belly. This species is found in a variety of aquatic habitats, mostly commonly in lowlands and foothills in streams, creeks, stock ponds, freshwater marshes, and lagoons. California red-legged frogs breed from November through April (Storer 1925, U.S. Fish and Wildlife Service 2002). Males usually appear at the breeding sites two to four weeks before females. Females are attracted to calling males. Females lay egg masses containing about 2,000 to 5,000 eggs, which hatch in six to 14 days, depending on water temperature (U.S. Fish and Wildlife Service 2002). Those eggs develop into tadpoles in 20–22 days. Larvae metamorphose in 3.5 to 7 months, typically between July and September (Storer 1925, Wright and Wright 1949, U.S. Fish and Wildlife Service 2002, Thomson et al. 2016). Males usually attain sexual maturity at two years of age and females at three years of age.

Ecological Requirements

California red-legged frog utilizes a variety of habitats, including various aquatic systems and riparian and upland habitats (U.S. Fish and Wildlife Service 2002). Breeding sites include a variety of aquatic habitats—larvae, tadpoles, and metamorphs use streams, deep pools, backwaters within streams and creeks, ponds, marshes, sag ponds, dune ponds, and lagoons (Thomson et al. 2016). Breeding adults are commonly found in deep (more than two feet), still, or slow-moving water with dense, shrubby riparian or emergent vegetation (Hayes and Jennings 1988). Adult frogs have also been observed in shallow sections of streams that are not shrouded by riparian vegetation (Thomson et al. 2016). Generally, streams with high flows and cold temperatures in spring are unsuitable for eggs and tadpoles. Stock ponds are frequently used by California red-legged frogs if the ponds are managed to provide suitable hydroperiod, pond structure, vegetative cover, and control of non-native predators (Stebbins 2003, Thomson et al. 2016).

California red-legged frogs consume a wide variety of prey. Adult frogs typically feed on aquatic and terrestrial insects, crustaceans, and snails (Hayes and Tennant 1985, Stebbins 1985), as well as worms, fish, tadpoles, smaller frogs, and occasionally mice (*Peromyscus* spp.) (U.S. Fish and Wildlife Service 2002). Aquatic larvae are mostly herbivorous algae grazers (Jennings et al. 1992). Feeding generally occurs along the shoreline of ponds or other watercourses and on the water surface. Juveniles appear to forage during both daytime and nighttime, whereas subadults and adults tend to feed more exclusively at night (Hayes and Tennant 1985).

During summer, California red-legged frogs often disperse from their breeding habitat to forage and seek summer habitat if water is not available (U.S. Fish and Wildlife Service 2002). This habitat may include shelter under boulders, rocks, logs, industrial debris, agricultural drains, watering troughs, abandoned sheds, or hayricks. The frogs will also use small mammal burrows, incised streamed channels, or areas with moist leaf litter (Jennings and Hayes 1994, U.S. Fish and Wildlife Service 1996, U.S. Fish and Wildlife Service 2002). California red-legged frogs spend more time under vegetative cover when bullfrogs are present (Thomson et al. 2016), suggesting that the use of vegetative cover by California red-legged frogs are dependent on several ecological factors. California red-legged frogs may move over two miles up or down drainages from breeding sites and have been observed using adjacent riparian woodlands up to 100 feet from water (Rathbun et al. 1993). Dispersing frogs have been recorded to cover distances from 0.25 mile to more than two miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger 1998). These dispersal movements are generally straight-line, point-to-point migrations rather than following specific habitat corridors. Dispersal distances are believed to depend on the availability of suitable habitat and prevailing environmental conditions.

California red-legged frogs generally use the extent of a riparian corridor no matter how narrow or wide it is. The primary features driving the use of this habitat are cool moist soil under shrubs or other vegetation where frogs can find refuge for short periods before returning to water. On rainy nights, California red-legged frogs may roam away from aquatic sites as much as one mile. California red-legged frogs often move away from water after their first winter. California red-legged frogs sometimes disperse in response to receding water, which often occurs during the driest time of the year (U.S. Fish and Wildlife Service 2005b).

Modeled Habitat Distribution in the RCIS Area

Model Parameters

Model parameters for California red-legged frog were developed to capture breeding, refugia, and dispersal habitat. Breeding habitat includes all wetland and ponds (excluding reservoirs) within conifer forest, cultivated agriculture, grassland, woodland, riparian woodland, and shrubland land cover types. To capture refugia habitat, a 100-foot buffer was applied to all breeding habitat. Dispersal habitat includes all suitable land cover types found within a two-mile buffer of the breeding habitat, which includes all of the land cover types in the conifer forest, cultivated agriculture, grassland, riparian woodland, and shrubland communities.

Rationale

Habitat for California red-legged frog was modeled using parameters similar to those used in the Habitat Plan (ICF International 2012).

Breeding and foraging habitat. Breeding sites used by California red-legged frogs include a variety of aquatic habitats (Stebbins 1985, Hayes and Jennings 1988, Thomson et al. 2016). Larvae, tadpoles, and metamorphs use streams, deep pools, backwaters within streams and creeks, ponds (including stock ponds), and marshes. Breeding adults are commonly found in deep (more than two feet), still or slow-moving water with dense, shrubby riparian or emergent vegetation (Hayes and Jennings 1988). Adult frogs have also been observed in shallow sections of streams that are not shrouded by riparian vegetation. Generally, streams with high flows and cold temperatures in spring are unsuitable for eggs and tadpoles. All existing ponds and streams surrounded by undeveloped land (i.e., non-urban areas) were therefore considered potential suitable breeding habitat for California red-legged frog (ICF International 2012).

Dispersal and refugia habitat. During dry weather, California red-legged frogs are likely to remain in or near water. California red-legged frogs may move over two miles up or down drainages from breeding sites and have been observed using adjacent riparian woodlands up to 100 feet from water (Rathbun et al. 1993). As ponds dry out, frogs disperse from their breeding sites to other areas with water or to temporary shelter or aestivation sites. For this reason, all grassland, shrublands, woodland, riparian woodland, and conifer forest land cover types within 100 feet of primary habitat are characterized as upland refugia. Dispersing frogs have been recorded to cover distances from 0.25 mile to more than two miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger 1998). Dispersal and migration movements are generally straight-line, point-to-point migrations rather than following specific habitat corridors (U.S. Fish and Wildlife Service 2000b, Stebbins 2002). They may be along long-established historic migratory pathways that provide specific sensory cues that guide the seasonal movement of the frogs (Stebbins 2002). Dispersal distances are believed to depend on the availability of suitable habitat and prevailing environmental conditions. However, because the actual movement patterns of California red-legged frogs in these habitats is generally not known, the model conservatively estimates that all grassland, shrublands, woodland, riparian woodland, conifer forest, and cultivated agriculture land cover types beyond 100 feet but within a radius of two miles from all potential breeding sites were potential migration or aestivation habitats for California red-legged frogs (ICF International 2012).

Model Results

Figure H-4, Appendix H, *Focal Species Habitat Models*, displays modeled breeding, refugia and dispersal habitat for California red-legged frog. Suitable habitat is modeled throughout the undeveloped lands in the RCIS area, primarily due to the even distribution of aquatic habitat in the non-urban portions of the RCIS area. Site-specific conditions should be surveyed to determine whether habitats on the site would support California red-legged frog.

Tricolored Blackbird

Regulatory Status

- **State:** Threatened
- **Federal:** None
- **Critical Habitat:** N/A
- **Recovery Planning:** N/A

Distribution

General

Tricolored blackbird is nearly endemic to California, with most of the global population occurring in California, and scattered populations in Oregon, Washington, Nevada, and western coastal Baja California (Meese et al. 2014). In California, tricolored blackbird occurs the Central Valley and surrounding foothills, and in coastal areas from Sonoma County to San Diego County. This species breeds locally in northeastern California. In winter, it is widespread along the Central Coast and San Francisco Bay area. There are 955 CNDDB occurrences for this species within its range.

Within the RCIS Area

The majority of the RCIS area provides breeding or foraging habitat for the tricolored blackbird. Sixteen occurrences documented in CNDDB and UC Davis Tricolored Blackbird Portal are in the RCIS area (California Department of Fish and Wildlife, California Natural Diversity Database 2019, UC Davis 2019); four are precise CNDDB occurrences, most of which are in the southern portion of the RCIS area. In 2014, a colony of approximately 600 individuals was observed at the Calero Reservoir. In 2016, a colony of approximately 40 individuals was observed nesting in cattails on the northern, western, and southern banks of Tooth Lake on the Canada de los Osos Ecological Reserve. Tricolored blackbird colonies have also been observed within the last five years at the Los Alamitos Percolation Ponds, Coyote Ranch Park, Del Puerto Canyon Road, Halls Valley, and Lake Cunningham Park (Figure H-5, Appendix H, *Focal Species Habitat Models*).

Life History

Tricolored blackbirds are closely related to red-winged blackbirds, but the two species differ substantially in their breeding ecology. Red-winged blackbird pairs defend individual territories, while tricolored blackbirds are among the most colonial of North American passerine birds (Bent 1958, Orians 1961a, 1961b, 1980, Orians and Collier 1963, Payne 1969, Beedy and Hamilton 1997). Breeding colonies historically comprised of up to hundreds of thousands of birds. In the 1930s, a single colony in Glenn County was estimated to include as many as 200,000 nests (approximately 300,000 adults) (Neff 1937). In more recent years, as many as 20,000 or 30,000 tricolored blackbird nests have been recorded in cattail marshes of nine acres or less (DeHaven et al. 1975a). The average size of breeding colonies varies among geographic regions and nesting substrate (Graves et al. 2013). Tricolored blackbird's colonial breeding system may have adapted to exploit a rapidly changing environment where the locations of secure nesting habitat and rich insect food supplies were ephemeral and likely to change each year (Orians 1961a, Orians and Collier 1963, Collier 1968, Payne 1969).

An itinerant breeder, tricolored blackbirds generally move to different breeding location after the first breeding attempt, with most birds nesting first in the San Joaquin Valley and subsequently moving north (Hamilton 1998, Wilson et al. 2016). In the northern Central Valley and northeastern California, individuals move after their first nesting attempts, whether successful or unsuccessful (Beedy and Hamilton 1997). Banding studies indicate that significant movement into the Sacramento Valley occurs during the post-breeding period (DeHaven et al. 1975b). Although when breeding conditions are favorable, a second breeding attempt may occur in the same or adjacent locations (Meese 2006, 2007, 2008). Comparable movements have not been reported in southern California, where the species is believed to be resident.

Ecological Requirements

Tricolored blackbirds have three basic requirements for selecting their breeding colony sites: open, accessible water; a protected nesting substrate, including either flooded, thorny, or spiny vegetation; and a suitable foraging space such as grasslands, agricultural lands, and open woodland, providing adequate insect prey within a few miles of the nesting colony (Hamilton et al. 1995, Beedy and Hamilton 1997, Meese et al. 2014, California Department of Fish and Wildlife 2018c). Historically, tricolored blackbird nested primarily in freshwater marshes dominated by cattails and bulrushes, with colony sites occurring to a lesser extent in were in willows, blackberries, thistles (*Cirsium* and *Centaurea* spp.), or nettles (*Urtica* sp.) (Neff 1937). An increasing percentage of tricolored blackbird colonies since the 1980s and 1990s have been reported in Himalayan blackberry (Cook 1996), and some of the largest recent colonies have been in silage and grain fields (e.g., triticale) (Hamilton et al. 1995, Beedy and Hamilton 1997, Hamilton 2000).

In Santa Clara County, tricolored blackbirds nest sporadically, favoring smaller marsh and wetland sites, often supported by artificial stock ponds or water retention impoundments (California Department of Fish and Wildlife 2017). Colony size in Santa Clara County is much smaller than is found in the Central Valley, often 10's to 100's of pairs rather than 1000's.

During winter, tricolored blackbirds are distributed across the lowlands of central and coastal California (Beedy et al. 2018). Concentrations of more than 15,000 wintering tricolored blackbirds may gather at one location and disperse up to 20 miles to forage (Neff 1937, Beedy et al. 2018). Individual birds may leave winter roost sites after less than three weeks and move to other locations (Collier 1968), suggesting winter turnover and mobility. In early March and April, most birds vacate wintering areas and move to breeding locations in the Sacramento and San Joaquin Valleys (DeHaven et al. 1975b).

Modeled Habitat Distribution in the RCIS Area

Model Parameters

Model parameters for tricolored blackbird were developed to characterize nesting habitat and foraging and wintering habitat. Nesting habitat includes wetland and pond land cover types (perennial freshwater marsh and pond) except seeps/springs (serpentine and non-serpentine) within grassland, oak woodland, riparian woodland, cultivated agriculture – undetermined, and grain, row crops, disked. Foraging and wintering habitat includes wetland and pond land cover types (seasonal wetland) except seeps/springs (serpentine and non-serpentine), cultivated agriculture, and grassland.

Rationale

Habitat for tricolored blackbird was modeled using parameters similar to those used in the Habitat Plan (ICF International 2012), though the breeding and foraging habitat in the Habitat Plan's model is referred to as nesting habitat in this RCIS.

Tricolored blackbirds historically nested primarily in emergent freshwater marshes dominated by cattails or bulrushes, with some colonies occurring in willows, blackberries, thistles, and nettles associated with sloughs and natural channels (Neff 1937). More recent colonies have been observed in a diversity of upland and agricultural areas (Collier 1968, Cook 1996, Hamilton 2004), riparian scrublands and woodlands (Orians 1961a, DeHaven et al. 1975a, Beedy et al. 1991, Hamilton et al. 1995, Beedy et al. 2018).

Small breeding colonies have been documented at public and private lakes, reservoirs, and parks surrounded by shopping centers, subdivisions, and other urban development. Adults from these colonies generally forage in nearby undeveloped upland areas. Beedy et al. (2018) predict that these small, urban wetlands and upland foraging habitats may continue to accommodate tricolored blackbirds in the future unless they are eliminated entirely by development. High-quality foraging areas include irrigated pastures, lightly grazed grasslands, dry seasonal pools, mowed alfalfa fields feedlots, and dairies (Beedy et al. 2018). Proximity to foraging habitat is extremely important to for the establishment of colony sites; tricolored blackbird breeding habitat is typically located near foraging habitat, and tricolored blackbirds typically forage within three miles of breeding habitat (Orians 1961a, Beedy and Hamilton 1997), although they have been reported foraging up to eight miles from breeding sites (Hamilton et al. 1992, Meese 2013). Foraging during the non-breeding season is not limited to proximity of a breeding colony site.

Riparian woodland is included in the model to be consistent with the Habitat Plan (ICF International 2012). Riparian woodland generally does not provide habitat for tricolored blackbird; however, some occupied off-channel ponds and wetlands occur in the slow-water portions of areas mapped in the Habitat Plan's land cover data as riparian woodland. Including riparian woodland land cover in the tricolored blackbird model ensured these off-channel ponds and wetlands are included in the habitat model.

Model Results

Figure H-5, Appendix H, *Focal Species Habitat Models*, displays modeled nesting habitat and foraging and wintering habitat for tricolored blackbird. Suitable foraging and wintering habitat are modeled throughout the undeveloped lands in the RCIS area, and small slivers of nesting habitat are located therein. The known occurrences are shown within the modeled habitat, except for two locations, one in the Guadalupe River watershed and one in the Lower Coyote Creek watershed. These locations are historical breeding locations for tricolored blackbird and breeding has not been documented at these two locations since 1984 and 1994, respectively (UC Davis 2019). The habitat model likely overestimates potential breeding habitat, as not all areas mapped as wetland and pond provides suitable breeding habitat. Similarly, including all riparian areas as m odeled breeding habitat likely overestimates suitable breeding habitat, as breeding habitat will be limited to small ponds and wetlands that occur in slow water portions of these riparian corridors. Site-specific conditions should be assessed to determine whether habitats on the site could support tricolored blackbird.

Burrowing Owl

Regulatory Status

- **State:** Species of Special Concern
- **Federal:** None
- **Critical Habitat:** N/A
- **Recovery Planning:** N/A

Distribution

General

Burrowing owl is found throughout non-mountainous western North America, from the Great Plains grasslands in southern portions of the western Canadian provinces south and west through the U.S. into Mexico. Burrowing owl are also found in of central and south Florida, Cuba, Hispaniola, north Lesser Antilles, and Bahamas (Poulin et al. 2011).

In California, the burrowing owl's range extends throughout lowland areas from the northern Central Valley to Mexico, with a small population in the Great Basin bioregion in northeast California (Cull and Hall 2007) and the desert regions of southeast California (Gervais et al. 2008). There are 1,984 CNDDB occurrences within its range (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

While overwintering habitat is distributed extensively throughout the RCIS area, breeding pairs occur primarily in the City of San José, at the San José International Airport, and Alviso near the baylands. Of the 1,984 known occurrences, 66 (3%) occur in the RCIS area (California Department of Fish and Wildlife, California Natural Diversity Database 2019)(Figure H-6, Appendix H, *Focal Species Habitat Models*).

Life History

Burrowing owls are small owls, between 7.5 and 9.8 inches long. This species is mostly a resident in California, but some northern California individuals may migrate as far as Central American during the winter. Burrowing owls are found at elevations as high as 5,300 feet in Lassen County (Zeiner et al. 1988). Burrowing owls are active yearlong and hunt during the day or night, frequently perching at burrow entrances. Burrowing owls in California typically begin pair formation and courtship in February or early March, when adult males attempt to attract a mate. Like other owls, burrowing owls breed once per year in an extended reproductive period, during which most adults mate monogamously. Both sexes reach sexual maturity at one year of age. Clutch sizes vary, and the number of eggs laid is proportionate to prey abundance (the more prey that is available, the more eggs owls tend to lay). Clutches in museum collections in the western United States contain 1–11 eggs (Murray 1976). The incubation period is 28–30 days. The female performs all the incubation and brooding and is believed to remain continually in the burrow while the male does all the hunting. The young begin emerging from the nest burrow when about two weeks old, and they remain closely associated with the nest burrow or nearby satellite burrows for several weeks (Thomsen 1971). The young fledge at 44 days but remain near the burrow and join the adults in foraging flights at dusk (Rosenberg et al. 2009).

Dispersal of adult (post-breeding dispersal) and juvenile (natal dispersal) burrowing owls after breeding or fledging has received increased study in recent years. Dispersal distances of 33 miles to roughly 93 miles have been observed in California for adults (post-breeding dispersal) and juveniles (natal dispersal), respectively (Gervais et al. 2008), although individuals vary in their movement patterns. While part of this variation may be attributed to environmental variation, post-fledging movements of 34 juvenile owls in the Imperial Valley between suggest that sex, fledging date, and sibling relationships may also influence movement patterns (Catlin and Rosenberg 2014). Long-distance dispersal may account for observed low genetic differentiation (i.e., high gene flow) among resident burrowing owl populations in California, suggesting that the patchy and discontinuous nature of burrowing owl habitat does not, by itself, isolate subpopulations (Korfanta et al. 2005).

Ecological Requirements

Throughout their range, burrowing owls require habitats with three basic attributes: open, well-drained terrain; short, sparse vegetation generally lacking trees; and underground burrows or burrow facsimiles (Klute et al. 2003, Gervais et al. 2008). Burrowing owls select sites that support short vegetation, even bare soil, presumably because these habitats provide a good field of view. Burrowing owls will tolerate tall vegetation, however, if it is sparse. Owls perch on raised burrow mounds or other topographic relief, such as rocks, tall plants, fence posts, and debris piles, to attain good visibility (Poulin et al. 2011).

Burrowing owls occur in grasslands, deserts, scrublands, agricultural areas (including pastures and untilled margins of cropland), earthen levees and berms, coastal uplands (especially by over-wintering migrants) (California Department of Fish and Wildlife, California Natural Diversity Database 2019), and urban vacant lots, as well as the margins of airports, golf courses, and roads (Gervais et al. 2008). In Santa Clara County, burrowing owls primarily occur in highly developed areas, such as the Moffett Federal Airfield and Shoreline Park.

Burrowing owls use burrows for nesting, resting, sleeping, and cover. They rely primarily on existing burrows created by mammals, primarily California ground squirrel (*Otospermophilus beecheyi*), for burrow construction. Structures such as culverts, piles of concrete rubble, and pipes are also used as nest sites. Artificial nest boxes are also frequently used by burrowing owls (Poulin et al. 2011). Burrowing owls have strong nest site fidelity and return to the same nest areas year after year. Seventy-four percent of occupied burrows were reoccupied at Moffett Airfield between 1992 and 1994 (Trulio 1994).

During the breeding season, burrowing owls also need enough permanent cover and taller vegetation within their foraging range to provide them with sufficient insect prey, which makes up their primary diet. Burrowing owls will also feed on small mammals, birds, amphibians, and reptiles, as well as carrion (Green et al. 1993, Plumpton and Lutz 1993, Gervais et al. 2000, York et al. 2002). In California, the California vole (Microtus californicus) is a primary prey speices (Gervais and Anthony 2003). Adults tend to forage close to their nest during the breeding season but have been recorded hunting up to 1.7 miles away (Gervais and Anthony 2003). Home range size is undetermined but appears to be a function of distance from the nest site (Shuford and Gardali 2008). Foraging area selection does not appear to be habitat based, as owls in the same region have been observed foraging in different types of cropland. Inter-nest distances, which indicate the limit of an owl's territory, have been found to average between 198 and 695 feet (Thomsen 1971, Haug and Oliphant 1990). Nocturnal foraging can occur up to a few miles away from burrows, and owls concentrate their hunting uncultivated fields, ungrazed areas, and other habitats with an abundance of small mammals (Haug and Oliphant 1990).

Modeled Habitat Distribution in the RCIS Area

Model Parameters

Burrowing owl habitat is classified into the following three types.

Occupied nesting habitat – 2017. This includes occupied nesting habitat, as mapped by the Santa Clara Valley Habitat Agency (2017) and provided to ICF for use in this RCIS. Occupied nesting habitat was mapped for known nesting sites and includes a 0.5-mile buffer around known nest sites to include suitable foraging habitat, as also used for the Habitat Plan (ICF International 2012). Suitable foraging habitat includes grassland and cultivated agricultural land cover types. See the Santa Clara Valley Habitat Plan Burrowing Owl Breeding Season Survey Report (Santa Clara Valley Habitat Agency 2017) for more details on the methods used to identify and map occupied nesting habitat.

Potential nesting and overwintering habitat. This habitat includes any grassland, agricultural, or barren land cover type located outside occupied nesting habitat, and inside the burrowing owl conservation zones used by the Santa Clara Valley Habitat Plan (ICF International 2012). The Habitat Plan's burrowing owl conservation zones are limited to the large valleys and a small amount of adjacent foothills within the Habitat Plan area.

Overwintering only habitat. This habitat includes annual grassland, serpentine grassland, valley oak forest and woodland, agricultural, and barren land cover types with flat (0–5%) or moderate (5–25%) slopes outside of potential nesting and overwintering habitat throughout the RCIS area (ICF International 2012).

Rationale

Habitat for burrowing owl was modeled using parameters similar to those used in the Habitat Plan (ICF International 2012).

Occupied nesting habitat. As described above, occupied nesting habitat in the Santa Clara Valley HCP/NCCP inventory area was mapped by the Santa Clara Valley Habitat Agency. This habitat type is based on survey data.

Potential nesting habitat. Open grassland or barren lands on the valley floor that are outside of a 0.5-mile radius of occupied nest sites could potentially be successfully colonized by nesting burrowing owls in the future as long as there are no limiting factors associated with those lands (e.g., development). These are areas where burrowing owls have not been documented nesting in the recent past but where habitat conditions are such that individuals could successfully colonize in the future (ICF International 2012).

Overwintering habitat. Burrowing owls typically occur in dry, open, shortgrass, treeless plains often associated with burrowing mammals. Golf courses, cemeteries, road allowances within cities, levees, and ruderal borders around agricultural fields, airports, and vacant lots in residential areas are also used for overwintering (Poulin et al. 2011). Within the RCIS area, grasslands, valley oak woodland, and barren lands represent these habitats. Burrowing owls are also known to use the margins of agricultural areas, or even occasionally using the whole field when it is fallow and ground squirrels are allowed to colonize. The slopes used to characterize overwintering habitat are the same as the slopes used by the Habitat Plan (ICF International 2012).

Model Results

Figure H-6, Appendix H, *Focal Species Habitat Models*, displays modeled habitat for burrowing owl. Potential nesting/overwintering habitat is located in rural portion of the lowland (i.e., central) Santa Clara Valley. Overwintering only habitat is widespread across the hills and mountains on the east and west sides of the valley. Very small patches of occupied habitat are located in the northern portion of Santa Clara County and straddling the southern border of the RCIS area between Santa Clara and San Benito counties. All but one occurrence of burrowing owl in the RCIS area are in either occupied habitat or potential nesting/overwintering habitat. Site-specific conditions will dictate whether burrowing owls could be present and should be assessed to determine whether the habitat on the site could support burrowing owl.

Swainson's Hawk

Regulatory Status

- **State:** Threatened
- **Federal:** None
- **Critical Habitat:** N/A
- **Recovery Planning:** N/A

Distribution

General

Swainson's hawks are generally complete migrants, breeding in North America and wintering primarily in South America (Woodbridge 1998). Until 1990, few credible winter records had been reported for Swainson's hawk in California. More recent winter records indicate that Swainson's hawk can be found overwintering, though rarely, in suitable habitat in the Central Valley, and southwestern California (eBird 2018) and in the Sacramento-San Joaquin River Delta (Erickson et al. 1990, Yee et al. 1991, Herzog 1996, eBird 2018). In California, Swainson's hawk is an uncommon resident and migrant during the breeding season in desert, shrubsteppe, grassland, and agricultural habitats in the Central Valley and Great Basin bioregions (Woodbridge 1998). There are 2,475 CNDDB occurrences within its range (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

Swainson's hawk is uncommon in the RCIS area, with the majority of occurrences being of migrating birds. Swainson's hawk were documented nesting in Santa Clara County (in Coyote Valley) in 2013 for the first time since 1894 (Phillips et al. 2014) and have nested successfully in the same area in Coyote Valley each year since 2013, except in 2017 when the nest was knocked out of the nest tree by high wind (Phillips, pers. comm. 2017). Of the 2,475 CNDDB occurrences, two (< 0.001%) are in the RCIS area (California Department of Fish and Wildlife, California Natural Diversity Database 2019 (Figure H-7, Appendix H, *Focal Species Habitat Models*).

Life History

Swainson's hawks exhibit a high degree of nest site fidelity, using the same nests, nest trees, or nesting stands for many years (England et al. 1997). Swainson's hawks arrive on their breeding grounds in late February and early March in the Central Valley and in mid-April in the Great Basin. Pairs are monogamous and may maintain bonds for many years (England et al. 1997). Immediately upon arrival onto breeding territories, breeding pairs begin constructing new nests or repairing old ones. One to four eggs are laid in mid- to late April, followed by a 30- to 34-day incubation period. Nestlings begin to hatch by mid-May followed by an approximately 20-day brooding period. Young remain in the nest until they fledge in 38 to 42 days after hatching (England et al. 1997). By late August – October, most Swainson's hawks migrate to the Pampas of southern South America (Bechard et al. 2010).

Ecological Requirements

Breeding

Swainson's hawks are typically present in California from early March, when individuals arrive on breeding grounds, through mid-October, when birds have departed for wintering grounds in Central and South America. Swainson's hawk's habitat generally consists of large, flat, open, undeveloped landscapes that include suitable grassland and/or agricultural foraging habitat and sparsely distributed trees for nesting (Bechard et al. 2010). Swainson's hawks usually nests in large, native trees such as valley oaks, Fremont cottonwood, and willows (*Salix* spp.), although non-native trees such as eucalyptus (*Eucalyptus* spp.) are also used (Bechard et al. 2010). Swainson's hawks may nest in riparian woodlands, roadside trees, trees along field borders, isolated trees, small groves, trees in windbreaks, and on the edges of remnant oak woodlands (Bechard et al. 2010). Nesting areas are within easy flying distance to foraging habitat such as alfalfa or hay fields.

Home ranges are highly variable depending on cover type and fluctuate seasonally and annually with changes in vegetation structure (e.g., growth, harvest) (Estep 1989, Woodbridge 1991, Babcock 1995). Smaller home ranges consist of high percentages of alfalfa, fallow fields, and dry pastures (Estep 1989, Woodbridge 1991, Babcock 1995). Larger home ranges were associated with higher proportions of cover types with reduced prey accessibility, such as orchards and vineyards, or reduced prey abundance, such as flooded rice fields.

Foraging

Historically, Swainson's hawk foraged in grass-dominated and desert habitats throughout most of lowland California. Over the past century, conversion of much of the historic range to agricultural use has shifted the nesting distribution into open agricultural areas that mimic grassland habitats or otherwise provide suitable foraging habitat. Agricultural uses that provide suitable foraging habitat include a mixture of alfalfa and other hay crops, grain, row crops, and lightly grazed pasture with low-lying vegetation that support adequate rodent prey populations (Estep 1989, Bechard et al. 2010).

Swainson's hawks regularly forage across a very large landscape compared with most raptor species. Data from Estep (1989) and England et al. (1995) indicate that it remains energetically feasible for Swainson's hawks to successfully reproduce when food resources are limited around the nest and large foraging ranges are required. Radio-telemetry studies indicate that breeding adults in the Central Valley routinely forage as far as 18.7 miles from the nest (Estep 1989, Babcock 1995). Swainson's hawks hunt primarily from the wing, searching for prey from a low altitude soaring flight, 98 to 295 feet above the ground and attack prey by stooping toward the ground (Estep 1989). During late summer, the diet of post-breeding adults and juveniles includes an increasing amount of insects, including grasshoppers and dragonflies. Dragonflies may constitute a major proportion of the diet of post-breeding and migrant birds. In alfalfa and corn crops in Idaho, post-breeding flocks also forage primarily on grasshoppers (Johnson et al. 1987). Dragonflies are also the primary prey for wintering birds in Argentina (Jaramillo 1993). Following their arrival on breeding grounds, Swainson's hawks shift their diet to include larger prey such as small rodents, rabbits, birds, and reptiles (England et al. 1997). This shift to a higher quality diet is prompted by nestlings' nutritional demands during rapid growth and the adults' high energetic costs of breeding.

Modeled Habitat Distribution in the RCIS Area

Model Parameters

Model parameters for Swainson's hawk were developed to capture foraging and nesting habitat in the RCIS area. Nesting habitat included riparian woodland land cover types. Foraging habitat included grassland land cover types, and cultivated agriculture land cover types except for orchard, vineyard, and developed agriculture. Modeled habitat was restricted to the Upper Santa Clara Valley level IV ecoregion (Griffith et al. 2016), which is the only part of the RCIS area where Swainson's hawk has been documented to successfully nest since 1894 (Phillips et al. 2014).

Rationale

In the RCIS area, Swainson's hawk nests in riparian corridors, with large trees for nesting, and utilize nearby grassland and cultivated agriculture for foraging. Agricultural uses that provide suitable foraging habitat include hay crops, grain, row crops, and pasture that support rodent populations (Estep 1989, Bechard et al. 2010). In California, Swainson's hawks primarily nest in flatter, valley landscapes, similar to the Upper Santa Clara Valley ecoregion.

Model Results

Figure H-7, Appendix H, *Focal Species Habitat Models*, displays modeled habitat for Swainson's hawk. Swainson's hawk modeled habitat is restricted to the Upper Santa Clara Valley, including Coyote Valley, where Swainson's hawk has recently successfully nested. Modeled nesting habitat is restricted to the riparian corridors. Modeled nesting habitat does not capture single or small patches of trees, which is potential nesting habitat when it occurs amongst foraging habitat. Foraging habitat is distributed throughout the Upper Santa Clara Valley. Site-specific conditions should be surveyed to determine whether habitats on the site provide suitable nesting or foraging habitat for Swainson's hawk.

San Joaquin Kit Fox

Regulatory Status

- **State:** Threatened
- **Federal:** Endangered
- **Critical Habitat:** N/A
- **Recovery Planning:** Recovery Plan for Upland Species of the San Joaquin Valley, California (U.S. Fish and Wildlife Service 1998a).

Distribution

General

San Joaquin kit foxes occur in some areas of suitable habitat on the floor of the San Joaquin Valley and in the surrounding foothills of the Coast Ranges, Sierra Nevada, and Tehachapi Mountains from Kern County north to Contra Costa, Alameda, and San Joaquin Counties (U.S. Fish and Wildlife Service 1998a). There are 1,018 known occurrences throughout its range (California Department of Fish and Wildlife, California Natural Diversity Database 2019). The largest extant populations of kit fox are in Kern County (Elk Hills and Buena Vista Valley) and San Luis Obispo County in the Carrizo Plain Natural Area (U.S. Fish and Wildlife Service 1998a).

Within the RCIS Area

San Joaquin kit fox is rare in the RCIS area, with occurrences generally clustered around the southeastern corner of the RCIS area. Of the 1,018 known San Joaquin kit fox occurrences, 4 (0.004%) are located within the RCIS area. All occurrences in the RCIS area are general occurrences, with the last documented in 2002 near Henry W. Coe State Park (California Department of Fish and Wildlife, California Natural Diversity Database 2019) (Figure H-8, Appendix H, *Focal Species Habitat Models*).

Genetic studies have shown that individuals from the San Luis Reservoir population, east of the RCIS area, interbreed with individuals from Alameda and Contra Costa Counties (Schwartz et al. 2000, in U.S. Fish and Wildlife Service 2006). It is assumed that the Pacheco Creek and Tequisquita Slough watersheds in the southeastern part of the RCIS area provide movement habitat between these two areas (U.S. Fish and Wildlife Service 2006). In the recovery plan for this species, USFWS describes its range in Santa Clara County as limited to the Pajaro River watershed (U.S. Fish and Wildlife Service 1998a).

Life History

The diet of San Joaquin kit foxes varies seasonally and geographically, based on local availability of potential prey. In the northern portion of their range, San Joaquin kit foxes most commonly prey on California ground squirrels, desert cottontails (*Sylvilagus audubonii*), black-tail jackrabbits (*Lepus californicus*), kangaroo rats (*Dipodomys* spp.), and pocket mice (*Perognathus* spp.) (Hall 1983, Orloff et al. 1986, U.S. Fish and Wildlife Service 1998a). Secondary prey taken opportunistically may include ground-nesting birds, reptiles, and insects (Laughlin 1970). Just north of the RCIS area in Contra Costa and Alameda counties, California ground squirrels are a primary prey (Orloff et al.

1986), though in other locations, San Joaquin kit fox appear to be strongly linked to the ecology of kangaroo rats (Cypher et al. 2000, U.S. Fish and Wildlife Service 2010b).

San Joaquin kit foxes can, but do not necessarily, breed their first year. Sometime between February and late March, two to six pups are born per litter (Zoellick et al. 1987, Cypher et al. 2000). The annual reproductive success for adults can range between 20% and 100% (mean: 61%;) and zero and 100% for juveniles (mean: 18%) (Cypher et al. 2000). Population growth rates generally vary with reproductive success, and kit fox density is often related to both current and the previous year's prey availability (Cypher et al. 2000). Prey abundance is generally strongly related to the previous year's precipitation, particularly drought conditions (Cypher et al. 2000, Dennis and Otten 2000, U.S. Fish and Wildlife Service 2010b).

Kit foxes may range up to 20 miles at night during the breeding season and somewhat less (6 miles) during the pup-rearing season (Girard 2001). The species can readily navigate a matrix of land use types. Home ranges vary from less than one square mile up to approximately 12 square miles (Spiegel and Bradbury 1992, White and Ralls 1993). The home ranges of pairs or family groups of kit foxes generally do not overlap (White and Ralls 1993).

Ecological Requirements

San Joaquin kit fox occurs in a variety of habitats, including grasslands, scrublands, vernal pool areas, alkali meadows and playas, and an agricultural matrix of row crops, irrigated pastures, orchards, vineyards, and grazed annual grasslands (U.S. Fish and Wildlife Service 1998a). San Joaquin kit foxes prefer areas with loose-textured soils (Grinnell et al. 1937, Egoscue 1962), suitable for digging, but can occur on virtually every soil type. Dens are generally located in open areas with grass or grass and scattered brush, and seldom occur in areas with thick brush. They are seldom found in areas with shallow soils due to high water tables (McCue et al. 1981) or impenetrable bedrock or hardpan layers (O'Farrell and Gilbertson 1979, O'Farrell et al. 1980). However, San Joaquin kit foxes may occupy soils with a high clay content where they can modify burrow dug by other animals, such as California ground squirrels, kangaroo rats, and badgers (Orloff et al. 1986, Cypher et al. 2012).

Cypher et al. (2013) mapped the remaining distribution and suitability of habitat within the San Joaquin kit fox's range, classifying habitat into one of three categories of quality: highly suitable, moderately suitable, or low suitability. Only small patches of moderate or low suitability habitat are in the RCIS area. Habitat attributes most important to San Joaquin kit fox were land cover, terrain, and low vegetation density. Highly suitable habitat includes saltbush scrublands (*Atriplex polycarpa, A. spinifera*) and grassland dominated by red brome (*Bromus madritensis*), while moderately suitable habitat includes alkali sink scrublands and grassland dominated by wild oats species (*Avena* spp.). Highly suitable habitat also includes flat or gently rolling terrain (i.e. average slopes less than five percent), with suitability declining as the average slope increases and terrain becomes more rugged. Other land cover types and anthropogenic habitat (e.g. agriculture and urban areas) were considered to have low suitability.

San Joaquin kit foxes use numerous dens throughout the year. San Joaquin kit foxes generally modify and use dens constructed by other animals, such as ground squirrels (Jensen 1972, Morrell 1972, Hall 1983), as well as human made structures (B.L. Cypher pers. comm., as cited in U.S. Fish and Wildlife Service 1998a). Dens are used for temperature regulation, shelter from inclement weather, reproduction, and escape from predators. Hall (1983) documented a family of seven kit foxes that used 43 dens in one year, while one other individual used 70 dens (K. Ralls, pers. comm., as cited in

Williams et al. 1998). Koopman et al. (1998) found that individuals within the Naval Petroleum Reserves use an average of 11.8 different dens each year, and den use does not differentiate between sexes. The number of dens used varied among seasons, with more dens used during the dispersal season than during the breeding or pup-rearing seasons. Den changes are believed to be primarily in response to a need to avoid coyotes, although local depletion of prey and increases in external parasites in the dens may also influence this behavior (Egoscue 1962).

Modeled Habitat Distribution in the RCIS Area

Model Parameters

Model parameters for San Joaquin kit fox were developed to capture movement and foraging habitat and low-use habitat. Movement and foraging habitat includes all grassland land cover types and seasonal wetlands that are adjacent to grasslands. Valley oak forest and woodland, blue oak woodland, and coast live oak forest and woodland within 500-feet of suitable grasslands were also modeled as movement and foraging habitat (ICF International 2012). Low-use habitat includes areas that San Joaquin kit fox may use occasionally for movement, including all cultivated agriculture types except vineyards and shrublands that are adjacent to movement and foraging habitat described above. These areas represent land that individuals might pass through while moving between other more suitable habitat types (ICF International 2012). The model was limited to watersheds currently thought to have potential to support kit fox movement and dispersal (U.S. Fish and Wildlife Service 1998a, U.S. Fish and Wildlife Service 2006, ICF International 2012, California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Rationale

Habitat for San Joaquin kit fox was modeled using parameters similar to those used in the Habitat Plan (ICF International 2012).

In the northern part of its range the San Joaquin kit fox occurs primarily in foothill grasslands (Swick 1973, Hall 1983, U.S. Fish and Wildlife Service 1998a), valley oak savanna and alkali grasslands (Bell 1994). They prefer habitats with loose-textured soils (Grinnell et al. 1937, Hall 1946, Morrell 1972), suitable for digging, but occur on virtually every soil type. Individuals from the San Luis Reservoir population interbreed with individuals from Alameda and Contra Costa Counties, north of the RCIS area, leading experts to believe that southern Santa Clara County may be a movement corridor between these two areas. This habitat model was based on that assumption and habitat that is shown in Figure H-8, Appendix H, *Focal Species Habitat Models*, should be considered movement and foraging habitat and low-use habitat (ICF International 2012).

Model Results

Figure H-8, Appendix H, *Focal Species Habitat Models*, displays modeled habitat for San Joaquin kit fox. Modeled movement/foraging habitat and low-use habitat is distributed throughout the undeveloped lands in the northeastern and southeastern portion of the RCIS area in the lands around Henry W. Coe State Park.

Mountain Lion

Regulatory Status

- **State:** None
- **Federal:** None
- **Critical Habitat:** N/A
- **Recovery Planning:** N/A

Distribution

General

Mountain lion ranges widely throughout the Americas, from the Canadian Yukon to the Strait of Magellan. More than half of California is prime mountain lion habitat. Mountain lion studies around California provide a crude estimate of between 4,000 and 6,000 mountain lions statewide (California Department of Fish and Wildlife 2007).

Within the RCIS Area

Much of the oak woodland, coniferous forest, and riparian in the mountains and foothills in the RCIS area is potential mountain lion habitat. Mountain lions are common at relatively low densities in these habitats.

Life History

Mountain lion, also known as cougar, puma, panther, and catamount, is the largest wildcat in North America. Mountain lions are solitary mammals that are very territorial and avoid other individuals except during courtship (Link et al. 2005). Mountain lions, mostly males, use scent markings, or scrapes, to communicate competitiveness and attractiveness to the opposite sex. Scrapes are leaves or duff scraped into a pile on which the they urinate (Logan and Sweanor 2001). Mountain lions become sexually mature at 24 months of age but will not breed until they have established a home range. The mating season is commonly from December to March but can occur at any time during the year. Gestation is 82 to 96 days and litter size is two to four kittens. Females use thick vegetation or rock piles for natal nurseries. They may settle while raising young, to protect from weather and to rest but otherwise are always on the move, making natal nurseries as they go (Link et al. 2005). The mother raises the kittens alone, nursing them for two months, at which time she teaches them to hunt. Young remain with the mother for 1.5 to two years (Logan and Sweanor 2001). Because male mountain lions have larger home ranges than females, one male may mate with multiple females in a given year. Males can live 10 to 12 years in the wild and females normally live longer. Female progeny will establish a territory adjacent to their mother, while males will disperse far distances from their natal area (Link et al. 2005).

Mountain lions primarily prey upon deer (Allen et al. 2015), but will also eat smaller animals such as coyote, porcupines, raccoons, and domestic animals. They usually hunt at night but will also hunt at dusk and dawn (Logan and Sweanor 2001). Allen et al. (2015) found that mountain lions will also hunting during diurnal hours as opportunities arise, especially during summer when young ungulates are available.

Human development affects hunting and feeding behavior. In the Santa Cruz mountains and adjacent lower elevation residential areas, fear of humans appears to cause mountain lions to spend less time at kill sites in residential environments. Mountain lions apparently kill more deer in residential environments to compensate for less time spent at kill sites, which could result in less energy gained from each predation event (Smith et al. 2017, Wang et al. 2017).

In the Santa Cruz mountains, mountain lions shift diets in areas with higher density of development. Mountain lions were found to kill a higher diversity of prey (e.g., deer, coyote, pets) and a higher proportion of small (<20 kilograms; [44 pounds]) prey in areas with higher development density than lower development density at two spatial scales (density of housing within 150 meters [492 feet] and 1 km [0.62 mile] surrounding a kill site) (Smith et al. 2016).

Ecological Requirements

Mountain lions inhabit a wide range of habitats in search for food and shelter (Hornocker and Negri 2009). Mountain lions are found wherever deer are present, generally in foothills and mountains, as well as deserts (Logan and Sweanor 2001). They can also be found in areas with rural and suburban human development (e.g., Wilmers et al. 2013, Smith et al. 2016, Wang et al. 2017). In the Santa Cruz mountains, mountain lions use shrub, forest, and areas with water and are deterred by grassland, which lacks effective stalking cover (Wilmers et al. 2013). Mountain lions prefer habitat with steep canyons, rock outcroppings and boulders, or with enough brush to aid their ambush hunting style (Link et al. 2005).

Because they are territorial and have low population densities, mountain lions require large areas of habitat (Logan and Sweanor 2001). Studies indicate that mountain lion densities range from zero to 10 lions per 100 square miles (California Department of Fish and Wildlife 2007). Adult males roam widely, covering a home range of 50 to 150 square miles, depending on time of year, terrain, and availability of prey. Females home ranges are about that half of males (Link et al. 2005). Beier (1993) found that mountain lions can survive in areas as small as 849 square miles, but any smaller and they are at risk of extinction from habitat patches. Beier also found that if as few as one to four mountain lions per decade immigrate into a small population, the probability of population persistence increases.

Human development and housing density affect mountain lion movement behavior and habitat use (e.g., Wilmers et al. 2013, Wang et al. 2017). In the Santa Cruz mountains, mountain lions generally avoid houses more than arterial roads (roads with speeds > 35 miles per hour). Mountain lions are more likely to use areas when traveling on steep slopes and less likely to use areas near houses close to water, likely because human activity is lower on steep slopes and greater near water (Wilmers et al. 2013).

Corridors for movement are important for this wide-ranging species in fragmented landscapes. Dickson et al. (2005) found that in Southern California, riparian vegetation was most often used for movement, and grassland, woodland and urbanized site were least used for movement. Dickson et. al. (2005) also found that mountain lion avoided two-lane paved roads for migration, but dirt roads facilitated movement.

Wilmers et al. (2013) used radio tracking data from mountain lions to model core use areas and least-cost corridors in the Santa Cruz Mountains within and beyond the RCIS area boundary (Figure H-9, Appendix H, *Focal Species Habitat Models*). The model predicts core areas where communication and denning are unimpeded by dense housing on either side of Highway 17 and corridors between core areas crossing Highway 17 (Figure H-9, Appendix H, *Focal Species Habitat Models*). Core areas are primarily east of Highway 17, with a single core area immediately west of Highway 17, northwest of Lexington Reservoir.

Modeled Habitat Distribution in the RCIS Area

A habitat model for mountain lion was not developed for this Santa Clara County RCIS because this species ranges widely throughout a broad variety of habitats in the mountains and foothills of the RCIS area. Rather, this RCIS uses the model of core use areas and least-cost corridors in the Santa Cruz Mountains from Wilmers et al. (2013) (Figure H-9, Appendix H, *Focal Species Habitat Models*) and data from publications relevant to the RCIS area (e.g., above and Section 2.3.1, *Habitat Connectivity*) to identify functional connections between habitats for mountain lion (Chapter 3, *Conservation Strategy*).

Congdon's Spikeweed

Regulatory Status

- **State:** California Native Plant Society List 1B.1
- **Federal:** None
- **Critical Habitat:** N/A
- **Recovery Planning:** N/A

Distribution

General

Congdon's spikeweed is distributed along the South Coast Ranges between Solano and San Luis Obispo counties. Populations are clustered in the East and South San Francisco Bay, Salinas Valley, and Los Osos Valley. There are 98 CNDDB occurrences of Congdon's spikeweed within its range (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

In the RCIS area, occurrences of Congdon's spikeweed are clustered around the southern edge of the baylands north of SR 237 and west of Interstate 880. Of the 98 known Congdon's spikeweed occurrences, 7 (7%) are located within the RCIS area (California Department of Fish and Wildlife, California Natural Diversity Database 2019 (Figure H-10, Appendix H, *Focal Species Habitat Models*).

Life History

Congdon's spikeweed is an annual herb up to 28 inches tall with small yellow compound flowers that bloom from May to November, with the peak blooming period between August and October. The growing period for this species is from approximately March to November (California Native Plant Society 2016, Calflora 2016, Baldwin et al. 2012). Species-specific pollination has not been documented, but other *Centromadia* species in the San Francisco Bay Area host a variety of pollinators, including bees, wasps, beetles, flies and butterflies. It is assumed that seeds are dispersed during storm events by strong winds and by overland sheet flow during precipitation. Birds and mammals may incidentally pollinate and disperse the seeds of Congdon's spikeweed.

Ecological Requirements

Congdon's spikeweed occurs in California annual grassland and disturbed sites such as agriculture fields or golf courses on lower slopes, flats, swales, and floodplains below 800 feet elevation (Baldwin et al. 2012). This species requires localized mesic areas where water collects. This species can be associated with heavy clay, alkaline or saline soils. Congdon's spikeweed can persist along tidal marsh edges at the tidal marsh-alluvial grassland ecotone. This species typically occurs in colonies and is more common in areas that have a lower density of competing non-native annual grasses. Occurrences in the RCIS area are associated with species such as Italian rye grass, saltgrass, pickleweed, bird's foot trefoil (*Lotus corniculatus*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), swamp grass (*Crypsis schoenoides*), rabbitsfoot grass, alkali heath, alkali mallow (*Malvella leprosa*), and other non-native grasses. Hybridization with the subspecies *Centromadia parryi* ssp. *rudis* was reported on for the North Livermore Road population (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Modeled Habitat Distribution in the RCIS Area and Rationale

Figure H-10, Appendix H, *Focal Species Habitat Models*, displays modeled habitat for Congdon's spikeweed. Although land cover types that may provide habitat suitable for Congdon's spikeweed occur throughout the RCIS area, modeled habitat was limited to potentially suitable habitat adjacent to the existing occurrences in the RCIS area, all located north of California SR 237 and west of Interstate 880 (California Department of Fish and Wildlife, California Natural Diversity Database 2019), to avoid greatly overestimating habitat for this species. Areas south and east of these highways are too developed and urbanized to support habitat for this species.

Congdon's spikeweed is generally associated with seasonally wet areas (Baldwin et al 2012, CalFlora 2016); however, in this portion of the RCIS area, this habitat is associated with ruderal or disturbed areas, including unmapped drainages and areas with minor topographic swales (California Department of Fish and Wildlife, California Natural Diversity Database 2019). Such areas were identified in aerial photographs and mapped as potential habitat for this species.

Mount Hamilton Thistle

Regulatory Status

- **State:** California Native Plant Society List 1B.2
- **Federal:** None
- **Critical Habitat:** N/A
- **Recovery Planning:** Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area (U.S. Fish and Wildlife Service 1998b)

Distribution

General

Mount Hamilton thistle is narrowly distributed, limited to the Mount Hamilton and Diablo Ranges of the South Coast Ranges. This species is endemic to Santa Clara, Stanislaus, and Alameda Counties in the San Francisco Bay Area. There are 36 occurrence of Mount Hamilton thistle within its range (ICF

International 2012), 41 of which are listed within CNDDB (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

In the RCIS area, Mount Hamilton thistle is located between San José and Morgan Hill along U.S. 101 in the Santa Teresa Hills, Coyote Ridge, and Silver Creek Hills. Outlying occurrences are located in the Santa Cruz Mountains and in the northeastern corner of the RCIS area near the border with Stanislaus County. Of the 36 Mount Hamilton thistle occurrences, 30 (83%) are located within the RCIS area (Figure H-11, Appendix H, *Focal Species Habitat Models*).

Life History

Mount Hamilton thistle is a perennial herb between 24 and 79 inches tall, with a single stem and white flower heads that are strongly nodding. This species blooms from April to October, with the peak blooming period between May and July. The growing period is year round (California Native Plant Society 2016, Calflora 2016, Baldwin et al. 2012). Little research has been conducted on pollination, but it can be assumed that Mount Hamilton thistle hosts a variety of pollinators, including bees, wasps, beetles, flies and butterflies, similar to other *Cirsium* spp. Seeds apparently disperse primarily within wetland habitat, while secondary dispersal due to hydrochory can move seeds to adjacent upland areas or into downstream wetlands during flood events. This species produces a large number of seeds, is highly viable, and germinates readily in suitable habitat; traits conducive to successful regeneration as long as suitable habitat exists (Hillman and Parker 2011).

Ecological Requirements

Mount Hamilton thistle is a strict serpentine endemic, found almost exclusively on serpentine and ultramafic soils. Mount Hamilton thistle occurs in perennial and intermittent drainages associated with seeps and springs, and adjacent transitional zones that are influenced by runoff or groundwater. The surrounding upland habitat is often serpentine grassland or serpentine rock outcrop, although sometimes populations are in drainages within foothill pine woodland or coast live oak woodland and forest. This species ranges in elevation from 320 feet to 2,900 feet. Most locations support dense, isolated colonies of 100 to 5,000 individual plants, although more than 18,000 plants were observed in one location in the RCIS area in 1992 (U.S. Fish and Wildlife Service 1998b). Extant CNDDB occurrences in the RCIS area are associated with species such as yellow monkeyflower, iris-leaved rush, hoary coffeeberry, Agrostis species (*Agrostis* spp.), barley species (*Hordeum* spp.), dallis grass (*Paspalum dilatatum*), two-tooth sedge, short spike hedge nettle (*Stachys pycnantha*), common verbena (*Verbena lasiostachys*), coast clover (*Trifolium wormskioldii*), rabbitsfoot grass, rush (*Juncus* spp.), and sedge species (*Carex* spp.) (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Modeled Habitat Distribution in the RCIS Area

Model Parameters

Modeled habitat for Mount Hamilton thistle includes two categories: potential and occupied. Potential habitat includes the serpentine seep/spring land cover type and serpentine grassland and serpentine chaparral land cover types where they occur within 25 feet of perennial, intermittent, and ephemeral streams (ICF International 2012). Many occurrences of Mount Hamilton thistle are in small, localized spring-fed drainages not identified in the land cover data as springs or seeps and were therefore not captured in modeled potential habitat. To capture occurrences and surrounding habitat that were not included within modeled potential habitat, occupied habitat was modeled to include all precise location CNDDB polygons and the area within a 25-foot buffer of the occurrence. The 25-foot buffer was not applied to those occurrences identified by CNDDB as having an 80-meter accuracy, as the buffer would likely capture unsuitable habitat. Occurrences whose locations were identified as general by CNDDB were not used to model occupied habitat. Potential habitat that overlapped with occupied habitat was re-categorized as occupied habitat. Therefore, occupied habitat includes all known CNDDB occurrences recorded as a precise location. Potential habitat includes potentially suitable habitat that does that does not overlap a known occurrence of Mount Hamilton thistle.

Rationale

Habitat for Mount Hamilton thistle was modeled using parameters similar to those used in the Habitat Plan (ICF International 2012).

Mount Hamilton thistle occurs on areas with serpentine characteristics. This can be any combination of serpentine soils, seeps or springs, typically along streams. The surrounding habitat is often serpentine bunchgrass grassland (ICF International 2012).

Model Results

Figure H-11, Appendix H, *Focal Species Habitat Models*, shows the modeled occupied and potential habitat for Mount Hamilton thistle. Occupied habitat includes all known CNDDB precise occurrences in the RCIS area, whereas the occupancy of potential habitat is unknown (note that in some cases in Figure H-11 the occurrence symbol obscures the underlying modeled habitat). In the RCIS area, potential habitat is limited to small linear patches where serpentine soils and streams intersect. These habitat patches are concentrated in the vicinity of the Coyote Ridge area of rural San José where serpentine soils and Mount Hamilton thistle occurrences are present. Occurrences that do not fall within potential or occupied habitat are likely fed by unmapped springs on slopes or ridges.

Tracy's Eriastrum

Regulatory Status

- **State:** Rare, California Native Plant Society List 1B.2
- **Federal:** None
- **Critical Habitat:** N/A
- **Recovery Planning:** N/A

Distribution

General

Tracy's eriastrum is distributed in northern and southern California in Colusa, Lake, Fresno, Tehama, Glenn, Kern, Shasta, Stanislaus, Tehama, Trinity, and Tulare counties. In the San Francisco Bay Area, populations of Tracy's eriastrium are known only from Santa Clara County. There are 119 occurrence of Tracy's eriastrum within its range (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

In the RCIS area, Tracy's eriastrum is located in the Mount Hamilton Range near San Antonio Valley. Of the 119 CNDDB occurrences, 4 (3%) are located within the RCIS area (Figure H-12, Appendix H, *Focal Species Habitat Models*).

Life History

Tracy's eriastrum is an annual herb up to 9 inches tall with small white to purple flowers. This species blooms from May to July, with the peak blooming period in June and July. The growing period for the species is March to July (Baldwin et al. 2012, California Native Plant Society 2016, Calflora 2016). There is no species-specific information available regarding pollinators, seed germination, seed dispersal, or seedling establishment.

Ecological Requirements

Tracy's eriastrum is found in chaparral, cismontane woodland, and valley and foothill grasslands between 1,033 to 5,839 feet. This species is associated with gravelly shale or clay soils and is often found in open areas (California Native Plant Society 2016). The occurrences in the RCIS area are located on the edge of an old dirt road along the top of a ridge under chamise shrubs, on a talus slope, and on eroding scree. In the RCIS area, this species is most commonly associated with chamise chaparral, with associated species such as Abram's eriastrum (*Eriastrum abramsii*), coastal sage scrub oak (*Quercus dumosa*), ceanothus (*Ceanothus* spp.), yerba santa (*Eriodictyon* spp.), non-native grasses (*Avena* spp., *Bromus* spp.) (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Modeled Habitat Distribution in the RCIS Area

A habitat distribution model was not developed for this species because of the low number of occurrences in the RCIS area and the uncertainty in its localized habitat requirements. A habitat model based on known habitat requirements and land cover type-relationships mapped at a regional scale would result in a model that greatly overestimates available habitat.

Rock Sanicle

Regulatory Status

- **State:** Rare, California Native Plant Society List 1B.2
- **Federal:** None
- **Critical Habitat:** N/A
- **Recovery Planning:** N/A

Distribution

General

Rock sanicle is endemic to the San Francisco Bay area in Contra Costa and Santa Clara counties. There are 9 CNDDB occurrences of rock sanicle within its range (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

In the RCIS area, populations are located in the vicinity of Mount Hamilton. Of the 9 CNDDB occurrences, 5 (56%) are located within the RCIS area (Figure H-12, Appendix H, *Focal Species Habitat Models*).

Life History

Rock sanicle is a biennial or perennial tubereous herb between 8 and 10 inches tall with small pale red-orange to yellow flowers that has a small tuber 0.8 to 1.4 inches wide. This species blooms from April to May, with the peak blooming period in June. The growing period for the species is February to May (Baldwin et al. 2012, California Native Plant Society 2016, Calflora 2016). There is no species-specific information available regarding pollinators, seed germination, seed dispersal, or seedling establishment.

Ecological Requirements

Rock sanicle occurs in mixed oak woodland, chaparral and valley and foothill grassland between 2,034 to 3,854 feet. This species grows on open, rocky scree, talus slopes, and bedrock outcrops (California Native Plant Society 2016, California Department of Fish and Wildlife, California Natural Diversity Database 2019). All four occurrences in the RCIS area are on open, talus (igneous rock) slopes. Three of these rocky slopes are identified as being below chaparral and one is surrounded by foothill pine and blue oak woodland. In the RCIS area, this species is commonly associated with species such as scytheleaf onion (*Allium falcifolium*), goose grass, ceanothus, Brewer's phacelia (*Phacelia breweri*), violet (*Viola* spp.), largeleaf sandwort (*Moehringia macrophylla)*, few flowered collinsia (*Collinsia sparsiflora),* common fiddleneck (*Amsinckia intermedia*) and linanthus (*Leptosiphon* spp.) (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Modeled Habitat Distribution in the RCIS Area

A habitat distribution model was not developed for this species because of the low number of occurrences in the RCIS area and the difficulty in mapping talus slopes at the scale of the land cover mapping. A habitat model based on known habitat requirements and land cover type-relationships mapped at a regional scale would result in a model that greatly overestimates available habitat.

Fragrant Fritillary

Regulatory Status

- **State:** California Native Plant Society List 1B.2
- **Federal:** None
- **Critical Habitat:** N/A
- **Recovery Planning:** N/A

Distribution

General

Fragrant fritillary is endemic to the San Francisco Bay area and central coastal California. This species occurs in Alameda, Contra Costa, Marin, Monterey, San Benito, San Francisco, San Mateo, Santa Clara, Solano and Sonoma counties from 0 to 1,345 feet. There are 82 CNDDB occurrences of fragrant fritillary within its range (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

In the RCIS area, most occurrences of fragrant fritillary are located on Coyote Ridge with others scattered throughout parks and open spaces between San José and Morgan Hill. Of the 82 CNDDB occurrences, 14 (17%) are located within the RCIS area (California Department of Fish and Wildlife, California Natural Diversity Database 2019) (Figure H-13, Appendix H, *Focal Species Habitat Models*).

Life History

Fragrant fritillary is a perennial bulbiferous herb between 4 and 14 inches tall with nodding white flowers. This species blooms from February through April, with the peak blooming period between March and April. The growing period for the species is year round (Baldwin et al. 2012, California Native Plant Society 2016, Calflora 2016). Little research has been conducted on its pollination biology, but it is likely that this species hosts a variety of pollinators, including bees, wasps, beetles, flies and butterflies. Seeds in the *Fritillaria* genus are generally dispersed by wind.

Ecological Requirements

Fragrant fritillary is found in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland, in both upland and seasonally saturated areas below 1,312 feet elevation (California Native Plant Society 2016). This species has a weak affinity for serpentine soils and also grows on clay and other soil types (Calflora 2016, California Department of Fish and Wildlife, California Natural Diversity Database 2019). This species has also been observed growing in California annual grassland habitat. Some species commonly associated with fragrant fritillary include purple needlegrass, blue dicks (*Dichelostemma capitatum*), soap plant, common muilla, shining pepperweed (*Lepidium nitidum*), purple clarkia (*Clarkia purpurea*), California buttercup (*Ranunculus californicus*), California poppy, and coyote brush (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Modeled Habitat Distribution in the RCIS Area

Model Parameters

Model parameters were developed for both primary and secondary habitat. Fragrant fritillary is often found on serpentine soils in grassland, but also on other soil types in grassland, oak woodland, and coastal scrub in the RCIS area. Primary habitat is defined as serpentine grassland between 0 and 1,500 feet in elevation on slopes with all degrees of steepness. Secondary habitat is defined as California annual grassland, northern coastal scrub/Diablan sage scrub, blue oak woodland, valley oak forest/woodland, coast live oak forest woodland, and mixed oak woodland and forest between 0 and 1,500 feet in elevation on slopes with all degrees of steepness. The southern extent of modeled habitat in the RCIS area was limited to north of SR 152, where this species is most likely to occur.

Rationale

Habitat for fragrant fritillary was modeled using parameters similar to those used in the Habitat Plan (ICF International 2012).

Fragrant fritillary is primarily found on serpentine soils within grasslands in RCIS area. The species may also occur on non-serpentine soils in grasslands, oak woodlands, and coastal scrub up to 1,500 feet (ICF International 2012). The habitat model was limited to habitat north of SR 152 to narrow the range in the RCIS area to where the species is most likely to occur based on known occurrences and the dominance of serpentine soils in grasslands.

Model Results

Figure H-13, Appendix H, *Focal Species Habitat Models*, shows the modeled habitat for fragrant fritillary. Primary habitat is clustered around Coyote Ridge where serpentine soils are present. Secondary habitat is found on the east and west sides of the valley floor. Secondary habitat is most prevalent in the southern portion of in Santa Clara County.

Loma Prieta Hoita

Regulatory Status

- **State:** California Native Plant Society List 1B.1
- **Federal:** None
- **Critical Habitat:** N/A
- **Recovery Planning:** N/A

Distribution

General

Loma Prieta hoita is endemic to the San Francisco Bay area. This species occurs in Alameda, Contra Costa, and Santa Clara counties. There are 34 CNDDB occurrences of Loma Prieta hoita within its range (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

In the RCIS area, most populations of Loma Prieta hoita are located in the Santa Cruz Mountains, with other scattered locations on Coyote Ridge. Of the 34 CNDDB occurrences, 31 (91%) are located within the RCIS area (California Department of Fish and Wildlife, California Natural Diversity Database 2019) (Figure H-14, Appendix H, *Focal Species Habitat Models*).

Life History

Loma Prieta hoita is a perennial shrub that grows up to 3 feet tall with three leaflets per leaf and dense terminal clusters of purple flowers. This species blooms from May to October, with the peak blooming period between March and July. The growing period for the species is year round (Baldwin et al. 2012, California Native Plant Society 2016, Calflora 2016). Little research has been conducted on this species' reproductive biology, but it is likely that this species hosts a variety of pollinators, including bees, wasps, beetles, flies and butterflies. It is assumed that seeds of this species are dispersed by wind and water, especially when individuals are growing near channels where seeds can be carried downstream. Birds and mammals may incidentally pollinate or disperse seeds of Loma Prieta hoita.

Ecological Requirements

Loma Prieta hoita occurs in cismontane woodland, chaparral, and riparian woodland (California Native Plant Society 2016). This species grows at elevations between 100 and 2,000 feet. Loma Prieta hoita is strongly associated with serpentine soils, but also grows on other soil types (California Department of Fish and Wildlife, California Natural Diversity Database 2019, Calflora 2016). It generally grows as an understory shrub on moist, shaded slopes or near gullies and drainages. This species has also been observed growing on rocky soils. Some species commonly associated with Loma Prieta in the RCIS area include leather oak, coast live oak, California bay, big leaf maple, toyon, California coffeeberry, California blackberry, Torrey's melica, sticky monkeyflower, poison oak, and coyote brush (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Modeled Habitat Distribution in the RCIS Area

Model Parameters

Loma Prieta hoita is strongly associated with serpentine soils in the understory of woodland and chaparral. Because serpentine land cover types are limited to SSURGO map units with 30% or more of the unit comprised as serpentine (e.g., serpentine hardwood, serpentine chaparral, serpentine riparian; Section 2.2.4.1, *Methods and Data Sources*), some suitable serpentine habitats were not captured by serpentine land cover types. To capture more occurrences in the model, suitable land cover types that occurred on SSURGO map units containing lower quantities of serpentine soil (i.e., 1 to 29%) were used to account for this species' strong affinity to serpentine soils.

Primary habitat was limited to the following land cover types between 100 and 2,000 feet elevation: coast live oak forest and woodland, mixed oak woodland and forest, and montane hardwood land cover types where they occurred on SSURGO map units with a serpentine soil component, and serpentine hardwood land cover types. Secondary habitat was limited to the following land cover types between 100 and 2,000 feet elevation: northern mixed chaparral/chamise chaparral, and mixed riparian forest and scrubland where they occurred on SSURGO map units with a serpentine soil component, and serpentine chaparral, and serpentine riparian cover types between 100 and 2,000 feet elevation.

Rationale

Habitat for Loma Prieta hoita was modeled using parameters similar to those used in the Habitat Plan (ICF International 2012).

Loma Prieta hoita is found in the understory of oak woodland between 100 and 2,000 feet elevation, on shaded slopes or in riparian areas. The species associated with Loma Prieta hoita correspond with the coast live oak woodland and mixed oak woodland land cover types. Secondary habitat appears to be mixed northern chaparral and mixed serpentine chaparral (ICF International 2012).

Model Results

Figure H-14, Appendix H, *Focal Species Habitat Models*, shows the modeled habitat for Loma Prieta hoita. Primary habitat is clustered around the eastern Santa Cruz Mountains and the southeastern corner of Santa Clara County. Secondary habitat is located in the Santa Cruz Mountains to the west of the primary habitat near the Santa Cruz county border.

Smooth Lessingia

Regulatory Status

- **State:** California Native Plant Society List 1B.2
- **Federal:** None
- **Critical Habitat:** N/A
- **Recovery Planning:** Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area (U.S. Fish and Wildlife Service 1998b)

Distribution

General

Smooth lessingia is endemic to the San Francisco Bay area. This species occurs only in Santa Clara County between 393 and 1,377 feet elevation. There are 44 CNDDB occurrences of smooth lessingia within its range (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

In the RCIS area, smooth lessingia occurs on the eastern slopes of the Santa Cruz Mountains and the hills adjacent to the Santa Clara Valley. All of the CNDDB occurrences are located within the RCIS area (Figure H-15, Appendix H, *Focal Species Habitat Models*).

Life History

Smooth lessingia is an annual herb that grows up to 24 inches tall with basal leaves less than 2.5 inches long, linear leaves along the stem, and three to five purple flowers per head. This species blooms from April to November, with the peak blooming period between September and November. The growing period for the species is March to November (Baldwin et al. 2012, California Native

Plant Society 2016, Calflora 2016). Little research has been conducted on reproduction for this species, but it is likely that this species hosts a variety of pollinators, including bees, wasps, beetles, flies, and butterflies. It is assumed that seeds of this species are dispersed by wind and water, especially seeds of individuals growing near aquatic channels. Germination of *Lessingia* seeds in the laboratory is apparently quite easy; however, factors such as local climate, soil, and herbivory may profoundly influence germination rate, seedling establishment, and survivorship in nature (U.S. Fish and Wildlife Service 1998b). Birds and mammals may incidentally pollinate or disperse seeds of this species.

Ecological Requirements

Smooth lessingia is found in serpentine grasslands and serpentine rock outcrops. This species is a broad endemic of thin, gravelly serpentine outcrops and roadcuts as well as chaparral and cismontane woodlands in open areas with serpentine soils (California Department of Fish and Wildlife, California Natural Diversity Database 2019, Calflora 2017). This species occurs at elevations between 300 and 1,600 feet. Smooth lessingia generally grows as expansive stands where vegetation cover is low and native diversity is high. This species is tolerant of disturbance and sometimes grows on roadcuts or at roadside but is limited by non-native plant invasion. In the RCIS area, associated plant species include California sagebrush, big berry manzanita, toyon, common yarrow, golden yarrow (*Eriophyllum confertiflorum*), dwarf plantain, hayfield tarweed, June grass species (*Koeleria* spp.), miner's lettuce (*Claytonia perfoliata*), purple needlegrass, serpentine leptosiphon, serpentine sunflower (*Helianthus bolanderi*), California gilia (*Gilia achilleifolia*), false brome (*Brachypodium distachyon*) and other non-native grasses (e.g., *Avena* spp. and *Bromus* spp.) (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Modeled Habitat Distribution in the RCIS Area

Model Parameters

Smooth lessingia is restricted to serpentine rock outcrops, serpentine roadcuts, and sparsely-vegetated serpentine grasslands. Habitat for smooth lessingia was thus defined as serpentine grassland and serpentine rock outcrops between 0 and 2,000 feet in elevation on slopes with all degrees of steepness.

Rationale

Habitat for smooth lessingia was modeled using parameters similar to those used in the Habitat Plan (ICF International 2012).

Smooth lessingia is restricted to serpentine rock outcrops, serpentine roadcuts, and sparsely-vegetated serpentine grassland below 2,000 feet (ICF International 2012).

Model Results

Figure H-15, Appendix H, *Focal Species Habitat Models*, shows the modeled habitat for smooth lessingia. The habitat is concentrated on Coyote Ridge north of Anderson Reservoir and scattered areas of serpentine soils in the Santa Cruz Mountains. Note that in Figure H-15, some patches of modeled habitat are smaller than the size of the occurrence symbol and may be obscured.

Most Beautiful Jewelflower

Regulatory Status

- **State:** California Native Plant Society List 1B.2
- **Federal:** None
- **Critical Habitat:** N/A
- **Recovery Planning:** Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area (U.S. Fish and Wildlife Service 1998b)

Distribution

General

Most beautiful jewelflower is endemic to the San Francisco Bay area and central California coast. This species occurs in Alameda, Contra Costa, Santa Clara, Monterey, and San Luis Obispo counties. There are 103 CNDDB occurrences of most beautiful jewelflower within its range (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Within the RCIS Area

In the RCIS area, most beautiful jewelflower is found on the eastern slopes of the Santa Cruz Mountains and the hills adjacent to Santa Clara Valley, other occurrences are found west of Gilroy and along the northern border of Santa Clara County. Of the 103 CNDDB occurrences, 44 (46%) are located within the RCIS area. Most of the occurrences in the RCIS area are on Santa Clara County Park lands and other protected lands, including open spaces and water district property (Figure H-16, Appendix H, *Focal Species Habitat Models*).

Life History

Most beautiful jewelflower is an annual herb that grows up to 32 inches tall and has lilac-lavender sepals and purple petals. This species blooms from March to October, with the peak blooming period between April and May. The growing period for the species is February to October (Baldwin et al. 2012, California Native Plant Society 2016, Calflora 2016). Most beautiful jewelflower is pollinated by insects such as bees, butterflies, beetles, and flies. *Streptanthus* flowers are self-fertile but cannot self-pollinate due to spatial and temporal separation of stamens and stigmas (Kruckeberg 1957, ICF International 2012). It is assumed that seeds are dispersed during storm events by strong winds and by overland sheet flow during precipitation.

Ecological Requirements

Most beautiful jewelflower is found on serpentine chaparral, cismontane woodland, and serpentine bunchgrass grasslands on serpentine rock outcrops or grassy openings (California Native Plant Society 2016). Most beautiful jewelflower is abundant in areas with low vegetation cover or native grasses and forbs. Most beautiful jewelflower can occur in open grasslands dominated by non-native annual grasses with relatively low cover. This species is strongly associated with serpentine soils but occasionally grows on other rocky soil types (Calflora 2017, California Department of Fish and Wildlife, California Natural Diversity Database 2019). Most beautiful jewelflower also grows in transitional zones between serpentine grassland and woodland or chaparral and is tolerant of moderate disturbance on serpentine roadcuts and road surfaces. Occurrences have been found between 311 and 3,280 feet elevation. Some species associated with most beautiful jewelflower include purple needlegrass, red brome, oats, meadow barley (*Hordeum brachyantherum*), cream cups (*Platystemon californicus*), linanthus (*Leptosiphon* spp.), beaked cryptantha (*Cryptantha flaccida*), chia sage (*Salvia columbariae*), California poppy, and small fescue (California Department of Fish and Wildlife, California Natural Diversity Database 2019).

Modeled Habitat Distribution in the RCIS Area

Model Parameters

Primary habitat is defined as serpentine grassland, serpentine rock outcrop, and serpentine chaparral from 0 to 3,500 feet elevation on slopes with all degrees of steepness. Secondary habitat is defined as non-serpentine rock outcrop (barren/rock land cover type) from 0 to 3,500 feet elevation on slopes with all degrees of steepness.

Rationale

Habitat for most beautiful jewelflower was modeled using parameters similar to those used in the Habitat Plan (ICF International 2012).

Most beautiful jewelflower is almost entirely restricted to serpentinite outcrops or soils derived from serpentinite (Kruckeberg 1954). The species is found within serpentine grasslands and serpentine chaparral, primarily in grassy openings or at the edge of oak woodlands. Most beautiful jewelflower is less commonly found in non-serpentine soils on rock outcrops (Mayer et al. 1994, ICF International 2012).

Model Results

Figure H-16, Appendix H, *Focal Species Habitat Models*, shows the modeled habitat for most beautiful jewelflower. Primary habitat is clustered around Coyote Ridge and small scattered patches in the Santa Cruz Mountains. Secondary habitat is located in northern Santa Clara County and on the east and west sides of the urban development adjacent to the San Francisco Bay.

2.2.6 Non-focal Species

CFGC 1856(a) states that "[a] conservation action or habitat enhancement action that measurably advances the conservation objectives of an approved regional conservation investment strategy may be used to create mitigation credits that can be used to compensate for impacts to focal species and *other species* [emphasis added], habitat and other natural resources, as provided in this section (emphasis added)." The Program Guidelines (California Department of Fish and Wildlife 2017) provide additional guidance for what must be included in an RCIS to enable credits to be created through a mitigation credit agreement (MCA; Chapter 4, *Implementation*, Section 4.4.2, *Mitigation Credit Agreements*) for species not included in an RCIS as focal species (i.e., non-focal species): "[to] create credits through an MCA (mitigation credit agreement) to offset future impacts to a specific species that species must be an approved RCIS' focal species or a species whose conservation need was analyzed or otherwise provided for in the RCIS."

Many species that were not selected as focal species for this Santa Clara County RCIS (Section 2.2.5.1, *Focal Species Selection Process*) have conservation needs similar to the focal species and may also be addressed through the conservation strategy for other conservation elements (e.g., serpentine soils, unique land cover types, and others; Section 3.7, *Conservation Strategy for Other*

Conservation Elements). For example, non-focal species that have habitat requirements that overlap with the habitat requirements of focal species will benefit from conservation actions and habitat enhancement actions that protect, restore, and enhance habitat for focal species. Land cover is the basis for the focal species habitat models (Section 2.2.5.2, *Habitat Distribution Models*) and the conservation strategy (Chapter 3, *Conservation Strategy*), and thus can be used as a common currency when analyzing how conservation goals, objectives, actions, and priorities for focal species and other conservation elements will also benefit non-focal species.

The Santa Clara County RCIS Steering Committee selected eight species to be included in this RCIS as non-focal species based on the potential need for mitigation credits for these species. Non-focal species include the following.

- Longfin smelt (*Spirinchus thaleichthys*);
- Western pond turtle (*Emys marmorata*);
- Western snowy plover (*Charadrius alexandrinus nivosus*);
- Ridgway's rail (*Rallus obsoletus obsoletus*);
- American badger (*Taxidea taxus*);
- Townsend's big eared bat (*Corynorhinus townsendii*);
- Salt marsh harvest mouse (*Reithrodontomys raviventris*); and
- Hoover's button celery (*Eryngium aristulatum* var. *hooveri*).

Appendix F, *Non-focal Species Summaries*, includes brief descriptions of the habitat requirements for the eight non-focal species and how conservation strategies for focal species and other conservation elements would benefit each non-focal species. Tables F-1a and F-1b in Appendix F show the general habitat relationships between non-focal species and this RCIS's land cover types. Table F-2 highlights the general similarities in habitat use and overlap between non-focal species and focal species, identified by similarities in affinities for land cover types. Land cover is the basis for the focal species habitat models (Section 2.2.5.2 *Habitat Distribution Models*) and the conservation strategy (Chapter 3, *Conservation Strategy*), and can be used as a common currency when considering how conservation goals, objectives, actions, and priorities for focal species will also benefit non-focal species. As such, this RCIS provides for the conservation of the focal species and non-focal species based on their similar habitat needs. It is assumed that MCAs that protect and/or enhance habitat for habitats that support focal and non-focal species alike, could result in mitigation credits for both focal and non-focal species.

2.3 Other Conservation Elements

CFGC 1852(c)(4) states that an RCIS will include, "important resource conservation elements within the strategy area, including, but not limited to, important ecological resources and processes, natural communities, habitat, habitat connectivity, and existing protected areas, and an explanation of the criteria, data, and methods used to identify those important conservation elements." This section identifies important *conservation elements* other than focal species and natural communities within the RCIS area. Other conservation elements were identified based on guidance from the Steering Committee, as well as from existing literature and data relevant to the RCIS area, as described in each section that follows.

2.3.1 Habitat Connectivity

Loss of habitat connectivity is one of the leading threats to biodiversity in the RCIS area. Movement is essential for wildlife to find mates, seasonal habitat, shelter, and food, and adapt to climate change. An interconnected landscape can help to maintain ecosystem services such as pollination of crops and the flow of genes that helps to maintain biodiversity (Mitchell et al. 2013). Wildlife also need to be able to move beyond their home ranges to find new habitat. Movement is essential to gene flow, which is necessary to maintain genetic diversity and increase the likelihood of long-term persistence of plant and animal populations. When populations are isolated in habitat patches, and individuals are unable to move through the landscape to other habitat patches and populations, populations are more susceptible to reduced genetic diversity (and associated deleterious effects), localized loss of habitat, disease, and ultimately extirpation. Although effects will vary for different species, landscape features can influence plant and wildlife's ability to move at a range of scales. Rugged topography, land cover types, and human development can all affect the ability of organisms to move through an area. Furthermore, as climate change alters habitats, animals and plants will be under increasing pressure to disperse to new areas to adapt to climate change. In fragmented habitats, such as the RCIS area, wildlife can be struck by vehicles or get stuck in fences as they attempt to crossroads and other anthropogenic barriers to reach suitable habitat. As climate change alters habitat conditions, the ability of wildlife to move across the landscape will become increasingly threatened without concerted efforts to maintain habitat connectivity and increase permeability across the landscape.

There is a wealth of information about connectivity in the region, from high-level, statewide modeling (*California Essential Habitat Connectivity Project* [Spencer et al. 2010]), to regional linkage modeling (*Critical Linkages: Bay Area and Beyond* [Penrod et al. 2013]), to localized assessments of key points of connectivity (*Santa Clara Valley Habitat Plan* [ICF International 2012], *Coyote Valley Linkage Assessment Study* [Diamond and Snyder 2016] and the *Coyote Valley Landscape Linkages Report* [Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017]*)*. Each of these information sources are discussed below and shown in Figures 2-22a and 2-22b.

2.3.1.1 California Essential Habitat Connectivity Project

The *California Essential Habitat Connectivity Project* (CEHCP) (Spencer et al. 2010) is a statewide assessment of large, intact blocks of natural habitat and connections between them. The project was commissioned by more than 60 federal, tribal, state, local agencies, and non-governmental organizations to facilitate incorporating natural resources consideration into regional analysis and land use planning. This analysis is intended to inform infrastructure planning and conservation investments statewide, as a means to improve connectivity for ecosystems and organisms.

The CEHCP used a GIS-based modeling approach to create a statewide wildlife habitat connectivity map and to identify the biological value of connectivity areas. CEHCP identifies natural landscape blocks, which include a combination of protected areas and other areas with intact natural communities at low risk of conversion to non-natural communities over time. The analysis determined which natural landscape blocks to connect and modeled least-cost path corridors to identify essential connectivity areas.

The Santa Clara County RCIS area is located within the Central Coast Ecoregion described in the CEHCP. Within this region, the CEHCP identifies natural landscape blocks in the Santa Cruz Mountains and in the Diablo Range (Figure 2-22a). Essential connectivity areas are located throughout the Santa Cruz Mountains, where gaps in protected lands exist. The CEHCP also identifies a combination of natural landscape blocks and essential connectivity areas along the western edge of the Santa Clara County RCIS area, south to the Pajaro River. Nearly all of the Diablo Range is shown as a natural landscape block, though only a portion of the range is protected. The area across the Santa Clara Valley floor, south of the City of San José and north of the City of Gilroy, is identified as an essential connectivity area linking the Santa Cruz Mountains to the Diablo Range. Along the southern border of the RCIS area, the Pajaro River corridor is identified as a potential riparian connection.

Since the CEHCP was completed, several additional connectivity studies have been conducted in the RCIS area. These studies provide local, fine-scale information on connectivity, practical solutions, and invaluable data that can be used to inform infrastructure and conservation planning in the RCIS area, in addition to the information provided in the CEHCP. Those studies are described below.

2.3.1.2 Critical Linkages: Bay Area and Beyond

Critical Linkages: Bay Area and Beyond (Critical Linkages) (Penrod et al. 2013) represents the best available data on wildlife linkages that are vital to connectivity in the nine-county Bay Area. These linkages were designed through an extensive scientific and stakeholder-driven process from 2012 to 2013. Critical Linkages identifies 14 landscape-level connections crucial to maintaining connectivity for wildlife between large landscape blocks within and adjacent to the nine-county Bay Area. Critical Linkages assessed and modeled movement routes for six of the RCIS focal species, including mountain lion, burrowing owl, California tiger salamander, California red-legged frog, foothill yellow-legged frog, and steelhead across the San Francisco Bay Area and surrounding counties based on suitable habitat between large blocks of land under existing protections (Penrod et al. 2013). Critical Linkages identifies six linkages in the RCIS area (Figure 2-22b).

- **Diablo Range–Gabilan Range.** This linkage connects Henry Coe State Park and Pacheco State Park in the Diablo Range with Pinnacles National Park in the Gabilan Range.
- **Diablo Range–Inner Coast Range.** This linkage connects protected lands in the southeastern part of the RCIS area just north of Highway 152 southeast through San Benito and Merced counties through the Inner Coast Range.
- **East Bay Hills–Diablo Range.** This linkage extends from protected areas in the East Bay Hills in Contra Costa County south into Alameda County, across Interstate 580, to protected areas in the Diablo Range in the northeastern part of the RCIS area.
- **Mount Diablo–Diablo Range.** This linkage extends southeast from protected areas in Contra Costa County south of Mount Diablo through eastern Alameda and western San Joaquin counties. The western edge of this linkage barely crosses the northeast corner of the RCIS area.
- **Santa Cruz Mountains–Diablo Range.** This linkage extends from the Stevens Creek watershed southeast along the eastern slope of the Santa Cruz Mountains. The linkage connects the Santa Cruz Mountains to the Diablo Range across U.S. 101 through the Coyote Valley and across the Pajaro River corridor.
- **Santa Cruz Mountains–Gabilan Range.** This linkage extends from the western Santa Cruz Mountains south to Pinnacles National Park in the Gabilan Range

The Conservation Lands Network website[16] provides more information on Critical Linkages: Bay Area and Beyond, and the Conservation Lands Network. The Conservation Lands Network Explorer[17] is an online mapping decision support tool that allows users to assess the biodiversity and conservation values of an area of interest (Penrod et al. 2013).

This Santa Clara County RCIS primarily uses Critical Linkages, rather than the CEHCP, to inform conservation strategies to protect and enhance habitat connectivity because Critical Linkages analyzes landscape connectivity at a finer, local scale (i.e., the San Francisco Bay Area) than the CEHCP (i.e., throughout California), resulting in a more detailed analysis of connectivity than the CEHCP. One result of the different level of analysis, for example, is that Critical Linkages identifies more, smaller-scale landscape blocks and linkages in the Santa Clara County RCIS area: the CEHCP identifies the Diablo Range as one natural landscape block, whereas Critical Linkages identifies several finer-scale landscape blocks within the Diablo Range (Figure 2-22b). The Gabilan Range is identified in Critical Linkages as an important landscape block in the South Bay Area, with connections between the Gabilan Range, Santa Cruz Mountains, and the Diablo Range. This highlights the importance of the Gabilan Range to the overall connectivity of the region, as well as the connections between the Santa Cruz Mountains and the Diablo Range in the southern end of the Santa Clara Valley (i.e., south of Coyote Valley).

The conservation goals and objectives for landscape connectivity (Chapter 3, *Conservation Strategy*, Section 3.7.1, *Habitat Connectivity and Landscape Linkage*) refer to the Critical Linkages, as well as information from targeted studies on animal movement across Coyote Valley and the Pajaro region in recent years (those studies are described below).

2.3.1.3 Santa Clara Valley Habitat Plan Landscape Linkages

Landscape linkages from the Habitat Plan are also included on Figure 2-22b, as indicated by arrows; these linkages are defined as habitat that allows for the movement of organisms from one area with habitat to another (ICF International 2012). These linkages were used to identify land necessary for wildlife movement within Santa Clara County and to habitat in adjacent counties. A literature review identified all known or potential linkages in the Habitat Plan's study area from the following sources. Linkages were also inferred from land cover data, occurrence data, and habitat distribution models.

- Statewide assessment of landscape linkages needs developed by expert opinions of wildlife biologists (California Wilderness Coalition 2002).
- Ecoregional planning process conducted for the central coast region (The Nature Conservancy 2006).
- A study of movement needs of mountain lions estimated by least-cost path analysis of regional land cover data (Thorne et al. 2002).
- A local workshop on landscape linkages in the Sierra Azul region held on October 11, 2006 (Coastal Training Program, Elkhorn Slough National Estuarine Research Reserve 2006).
- Wildlife movement data from the study area for American badgers (Diamond 2006), Tule elk (Coletto 2006), bobcat, and other species.

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16 https://www.bayarealands.org/

17 https://www.bayarealands.org/explorer-tool/

- Locations of existing culverts, bridges, and other overpasses suitable for wildlife along U.S. 101 between Metcalf Road in San José and the Coyote Creek bridge crossing near Morgan Hill (California Department of Fish and Game 2006).
- Locations of median barriers and existing culverts, bridges, and other overpasses suitable for wildlife along SR 152 between the SR 156 interchange and the Santa Clara/Merced County line (data collected by Jones & Stokes in February 2007).
- Coyote Valley Specific Plan Draft Environmental Impact Report (City of San José 2007).

Details on each landscape linkages can be found in Chapter 5 of the Habitat Plan. The numbers shown on the landscape linkages in Figure 2-22b are the same as those used in the Habitat Plan for consistency.

2.3.1.4 Localized Linkage Assessments

The *Coyote Valley Linkage Assessment Study* (Study) and the *Coyote Valley Landscape Linkages Report* (Report) provide data on habitat connectivity and wildlife movement in Coyote Valley in the RCIS area (Diamond and Snyder 2016, Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017). These documents evaluate wildlife pathways in habitats across the valley floor. The Study was among the first to publish wildlife movement data across the valley floor where wildlife can travel from the Santa Cruz Mountain foothills on the west side of the valley to Coyote Ridge and the Diablo Range on the east side. This study includes recommendations for improvements to wildlife movements at known barriers on the valley floor (Diamond and Snyder 2016).

The Report presents a landscape linkage design across Coyote Valley that identifies important wildlife pathways and opportunities for restoration and barrier modification, including modification of existing barriers and proposed new wildlife crossings. It is intended to build upon and refine the linkages that were identified in Critical Linkages for Coyote Valley. The Report stresses the importance of maintaining Fisher Creek as a wildlife pathway because it is currently the only culvert that allows wildlife to pass underneath Monterey Road. The Report also highlights several other important landscape features for wildlife connectivity, such as the Laguna Seca wetlands and Tulare Hill (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017).

The Natural Conservancy's Pajaro Study 2012-2013 (Pajaro Study) (Diamond and Snyder 2013) identifies the Soap Lake Floodplain (i.e., upper Pajaro River floodplain) as a primary connection between the Diablo and Santa Cruz mountain ranges at the southern end RCIS area east of U.S. 101 and west of SR 152. This region contains a variety of habitats, including riparian systems, agriculture lands, and ranchlands that are critical to wildlife movement through the area. The Pajaro Study found that all of these habitat types (i.e., both vegetated and unvegetated) support wildlife movement and connectivity across the Soap Lake Floodplain. Multiple habitats over large landscapes in the floodplain are necessary to allow animals to take different routes during flooding events and to provide landscape resiliency to future climate change, which may affect some routes through the floodplain (Diamond and Snyder 2013).

Figure 2-22b shows several linkage features that were identified in the documents described above, including culverts, overpasses, underpasses, and other crossings. These linkages features are identified as conservation priorities in the RCIS (Chapter 3, *Conservation Strategy*, Section 3.7.1.2, *Conservation Priorities*). Note, however, that other linkage features may be present in the RCIS area in areas that have not yet been identified.

2.3.2 Working Landscapes

CFGC 1852 (e)(1) requires that an RCIS consider "the conservation benefits of working lands for agricultural uses." *Working lands* are areas where people live and work in a way that allows ecosystems or ecosystem functions to be sustained. To support this analysis, the following section describes the extent of farmland and rangeland in the RCIS area. This information is based on the latest annual report of agricultural production in Santa Clara County compiled by the county's Agricultural Commissioner (Santa Clara County 2015).

2.3.2.1 Farmland

In 2015, 23 different agricultural commodities grown in Santa Clara County exceeded $1,000,000 in crop value. Santa Clara County's top three crops for over 10 years continue to be nursery crops (valued at $65,974,000), mushrooms ($64,533,000), and bell peppers ($19,247,000). Other important crops include corn, tomatoes, spinach, and grapes. Over the last 30 years the land being farmed has declined from a peak of 40,000 acres in the late 1980s to the current level of about 20,000 acres. This excludes rangeland but includes 4,000 acres per year of dry farmed grain hay. Ecosystem services provided by farmland include a food supply, regulation of soil and water quality, carbon sequestration, and habitat for native wildlife (Power 2010, U.S. Department of Agriculture 2018).

2.3.2.2 Rangeland

Grasslands, oak woodlands, and shrublands provide important rangeland for livestock, as well as habitat for many of the focal species in this Santa Clara County RCIS. Rangelands provide important ecosystem services, including livestock production, water quality and supply, habitat for native biodiversity, and carbon sequestration (Sala et al. 2017). Rangeland comprises a significant portion of the unincorporated portion of Santa Clara County (approximately 49% of the entire County). Rangeland is generally located in the hills east and west of developed areas of the north and south valleys in Santa Clara County in the RCIS area (Figure 2-23).

Rangelands provide many ecosystem services such as habitat for wildlife (Hunting 2003, Jantz et al. 2007), carbon sequestration (Schuman et al. 2002, Derner and Schuman 2007), nutrient cycling, and food production (Jones and Donnelly 2004, Murray et al. 2012). The grasslands and oak woodlands used as rangelands in the RCIS area evolved under the influence of prehistoric herbivores—including herds of deer, elk, pronghorn, and other grazing animals—and without competition from non-native annuals, which currently dominate much of the region. In the absence of these large native herbivores, appropriate livestock grazing of cattle, sheep, and goats is a valuable range management tool, used to manage infestations of invasive plants, promote populations of native plants and animals, and reduce wildfire fuel loads (Jodi McGraw Consulting 2015).

Livestock grazing is the most widespread land management practice in the world, affecting 70% of the land surface of the western United States (Krausman et al. 2009). Grazing reduces the amount of accumulated plant litter, thereby favoring native plant establishment and growth and enhancing the overall composition of native plant communities. Non-native annual grasses and herbs tend to rapidly monopolize landscapes and can inhibit the germination of seeds and growth of native species through the capture of water and mineral resources and the physical and chemical effects of accumulated plant litter (Jodi McGraw Consulting 2015). Moderate levels of grazing are generally ideal for maintaining and enhancing native vegetation by reducing competition from more aggressive, non-native annual plants. Moderate grazing can also improve conditions for covered species by reducing dense ground cover, which can impede movement and decrease populations of burrowing rodents, which provide burrows and are prey for some covered species (e.g., burrowing owl, California tiger salamander, and Swainson's hawk) (Ford et al. 2013). Specific grazing practices in any given location should be selected based on site-specific goals.

2.3.3 Unique Land Cover Types

Unique land cover types are locally rare (i.e., within the RCIS area) land cover types that support native vegetation and one or more focal plant or wildlife species. Many of these land cover types have been historically developed and are currently under threat from invasive non-native species, human disturbance, or disease. This RCIS includes conservation strategies for unique land cover types to protect, enhance, and restore the diversity of natural communities in the RCIS area, particularly those that may not otherwise benefit from local conservation efforts.

Each unique land cover type was identified from the list of land cover types in the RCIS area (Section 2.2.4, *Natural Communities and Land Cover*). The following criteria were used to define unique land cover types. These criteria are not mutually exclusive; however, in most cases multiple criteria apply to each unique land cover type.

- CDFW's list of California Sensitive Natural Communities[18] (California Department of Fish and Wildlife 2018b, California Department of Fish and Wildlife, California Natural Diversity Database 2019).
- Locally rare vegetation type comprising 2% (Table 2-5) or less of the total land area of the RCIS area.
- Associated with serpentine soils or rock (California Native Plant Society 2016). See Section 2.2.4.1, *Methods and Data Sources* for an explanation of how land cover – serpentine soil or rock associations were identified and classified as land cover types.
- Provides irreplaceable habitat for focal species (e.g., critical to survival and recovery).[19]

Each land cover type was evaluated against these criteria, using the sources indicated in this section, to determine whether or not the land cover type qualifies as unique to the RCIS area. There are 22 unique land cover types in the RCIS area (Table 2-5).

2.3.4 Serpentine Soils

Serpentine soils are soils that are derived from weathered ultramafic rock such as serpentinite, dunite, and peridotite, and are characterized by low plant growth and productivity, and generally have lower amounts of vegetation cover, as well as lower cover of non-native species, than California annual grasslands (McNaughton 1968, Holland 1986).

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[18] This RCIS uses CDFW's list of California Sensitive Natural Communities (California Department of Fish and Wildlife 2018b) to inform the identification of unique land cover types in the RCIS area, for the purposes of this RCIS only. Classification of unique land cover types in this RCIS is not intended to imply that those land cover types should be included on the list of California Sensitive Natural Communities.

[19] Multiple sources, dependent on the species (Section 2.2.5, *Focal Species*), were used to determine whether or not the land cover type provides irreplaceable habitat for focal species.

The unique growing conditions are due in large part to the high content of heavy metals in the soil such as chromium, nickel, and cobalt, which are toxic to most plants, a very low ratio of calcium to magnesium, unusually high levels of iron, and limiting levels of key nutrients for plant growth such as nitrogen, phosphorous, potassium, and calcium (Kruckeberg 1984). Serpentine soils support highly specialized plant species and natural communities (U.S. Fish and Wildlife Service 1998b). Numerous focal plant species (i.e., Mount Hamilton thistle, Loma Prieta hoita, smooth lessingia, most beautiful jewelflower, and fragrant fritillary), and plant and wildlife species that aren't included in this Santa Clara County RCIS are associated with serpentine soils.

As with other soils, serpentine soils provide important ecosystem services such as water cycling, carbon sequestration, and maintenance of biodiversity (Zhu and Meharg 2015). Protection of serpentine soils and the vegetation communities, focal species, and biodiversity that they support is an important component of this RCIS's conservation strategy. The conservation strategy for serpentine-dependent focal plant species (Section 3.6, *Conservation Strategy for Focal Species*) and serpentine soils (Section 3.7.3, *Serpentine Soils*) is designed to provide for the conservation needs of focal species and other serpentine associated species. The conservation strategy for serpentine soils will protect and enhance habitat for those species that occur on serpentine soils but are not included as focal species in this RCIS (Section 3.7.3, *Serpentine Soils*).

Serpentine soils in the RCIS area were identified during development of the land cover dataset (Section 2.2.4.1, *Methods and Data Sources*). Table 2-8 provides a list of the serpentine soil series found in the RCIS area, and the amounts of serpentine soils therein. Although serpentine soils are limited in their distribution in the RCIS area (Figure 2-10), they support most of the focal plant species and several unique natural communities.

Table 2-8. Serpentine Soils, by Series, in the RCIS Area

Serpentine Soil Series	Soil Series Amount (acres)	Percent in the RCIS Area
Climara	2,566	9
Gilroy	1,077	4
Henneke	2,687	9
Hentine	809	3
Maxwell	759	3
Montara	14,445	51
Rock outcrop	1,422	5
Santerhill	4,789	17
Grand Total	**28,554**	**100**

Source: Natural Resource Conservation Service 2016, SSURGO database

2.4 Pressures and Stressors on Focal Species and other Conservation Elements

Section 1852(c)(5) of CFGC requires that an RCIS include a summary of historic, current, and projected future pressures and stressors in the RCIS area, including climate change vulnerability, on the focal species, habitat, and other natural resources, as identified in the best available scientific information, including, but not limited to, the SWAP. The Program Guidelines (California

Department of Fish and Wildlife 2017) define *pressure* as an anthropogenic (human-induced) or natural driver that could result in changing the ecological conditions of the focal species or other conservation element. *Stressors* are negative by definition. Pressures can be positive or negative depending on intensity, timing, and duration. Negative or positive, the influence of a pressure to the target is likely to be significant.

Understanding the pressures and stressors experienced by the focal species and their habitats within the RCIS area is one of the critical steps necessary to define conservation actions to counteract them. This Santa Clara County RCIS identifies 10 general categories of pressures on focal species, their habitat, and other natural resources in the RCIS area. Within these 10 categories, 19 of the 22 pressures identified in the SWAP are addressed. The 10 categories include:

- Housing and urban areas.
- Livestock, farming, and ranching.
- Climate change and its influence on sea-level rise, drought, and wildfire.
- Non-native species and disease.
- Loss of habitat connectivity (also known as habitat fragmentation).
- Disruption of natural fire disturbance regime.
- Dams and water management/use.
- Mining and quarrying.
- Airborne pollutants.
- Tourism and recreation.

Three pressures from the SWAP are not addressed here because, while they are important in the Bay Delta and Central California Province, they are not a significant stressor on ecosystems in the RCIS area. Those pressures are renewable energy, shipping lanes, and wood and pulp plantations.

Each of these pressures and stressors is summarized and discussed in detail in relation to the focal species and other conservation elements discussed in this chapter, with discussion relying heavily on the SWAP. A matrix showing the association between pressures and stressors and each focal species is included in Table 2-9. The focal species and other conservation elements discussed in the following sections can be referenced in Section 2.2.5, *Focal Species* and Section 2.3, *Other Conservation Elements*, respectively.

Table 2-9. Pressures and Stressors on each Focal Species

Pressures and Stressors	Housing and Urban Areas	Livestock, Farming, and Ranching	Climate Change	Non-native species and disease	Loss of Habitat Connectivity	Disruption of Natural Fire Disturbance Regime	Dams and Water Management/ Use	Mining and Quarrying	Airborne Pollutants	Tourism and Recreation
Focal Species										
Central California Coast steelhead	X	X	X	X	X	X	X	X	--	X
South-Central California Coast steelhead	X	X	X	X	X	X	X	X	--	X
California tiger salamander	X	X	X	X	X	X	X	X	X	X
Foothill yellow-legged frog	X	X	X	X	X	X	X	X	X	X
California red-legged frog	X	X	X	X	X	X	X	X	X	X
Tricolored blackbird	X	X	X	X	X	X	X	--	--	--
Burrowing owl	X	X	X	X	X	X	--	--	--	--
Swainson’s hawk	X	X	X	X	X	X	--	--	--	--
San Joaquin kit fox	X	X	X	X	X	X	--	--	--	--
Mountain lion	X	X	X	X	X	--	--	--	--	X
Congdon’s spikeweed	X	X	X	X	X	X	--	--	--	--
Mount Hamilton thistle	X	X	X	X	X	X	X	--	X	--
Tracy’s eriastrum	X	X	X	X	X	X	--	--	--	--
Rock sanicle	X	X	X	X	X	X	--	--	--	--
Fragrant fritillary	X	X	X	X	X	X	--	--	X	--
Loma Prieta hoita	X	X	X	X	X	X	--	--	X	--
Smooth lessingia	X	X	X	X	X	X	--	--	X	--
Most beautiful jewelflower	X	X	X	X	X	X	--	--	X	--

2.4.1 Housing and Urban Areas

Economic and population growth is a driver of development, leading to an increased demand for housing, commercial development, services, transportation, and other infrastructure, which in turn puts increasing pressure on the state's land, water, and other natural resources. The primary cause of habitat loss and degradation in the RCIS area is the increasing human population and its high demand for a limited supply of land, water, and other natural resources. Natural habitats in the RCIS area have been converted to a variety of land uses, including high-density urban, rural residential, weedy pastureland, dryland farming, irrigated cropland, and orchards and vineyards. Wildlife species differ in their tolerances of each of these land uses, with many unable to adapt to the more intensive land uses. Beyond direct habitat loss, converting land to more intensive land uses creates additional stressors, including invasive species, human disturbance, wildfire suppression, and insect control, that further degrade ecosystem health and wildlife viability.

Growth and development, including urban, commercial, and industrial development, can apply major stresses on focal species and habitats. Housing and urban areas include the following pressures that could impact focal species.

- Land conversion.
- Commercial and industrial areas (including industrial effluents).
- Garbage and solid waste.
- Household sewage and urban waste water.
- Roads and railroads (also reference wildlife connectivity section).
- Utility and service lines.

Urban development in the RCIS area has resulted in the loss, degradation, and fragmentation of natural habitats (both terrestrial and aquatic), and agricultural land. For example, historically, much of the western Santa Clara Valley was comprised of wet meadows, freshwater marsh and ponds, oak woodland, savanna, and chaparral (Beller et al. 2010). With approximately 190,000 acres of the RCIS area developed, urbanization has caused irrevocable loss of historic open space and species' habitats in the past two decades, particularly on the valley floor. Over 200,000 acres of agricultural land have been lost in the Bay Area since 1984, with Santa Clara County losing 45% of its agricultural land.

Future development in the RCIS area will further stress focal species and other conservation elements. By 2040, the San Francisco Bay Area is projected to add 2.4 million people, increasing total regional population from 7.2 million to 9.6 million, an increase of 30% or roughly 1% per year (Metropolitan Transportation Commission 2017a, 2017b). Santa Clara County has a population of 1.9 million people and is the largest county in the Bay Area. The population in Santa Clara County is expected to increase by 1% yearly through 2020 (California Department of Transportation 2016). Greenbelt Alliance's At Risk analysis shows more than 63,400 acres of farmland and rangeland currently at risk of development, particularly in south Santa Clara County (Greenbelt Alliance 2012). Of the remaining farmland, more than half is at risk of development over the next thirty years (San Francisco Bay Area Planning and Urban Research Association 2013). Continued loss of habitat, through permanent or temporary conversion to other purposes, is a key pressure, primarily in the western portion of the RCIS area, and most heavily in the urban center of San José and Silicon Valley, south through the Upper Santa Clara Valley.

Beyond direct habitat loss, converting land to more intensive human-related uses indirectly affects focal species and other conservation elements by, among other pressures, release of commercial and industrial waste and pollutants from point and non-point sources, garbage, and solid waste. Garbage and solid waste from housing and urban development may directly affect wildlife by entangling or poisoning individuals. Runoff from residential and commercial areas, landscaped yards, roads and parking lots, and domesticated animal feces include pollutants and pathogens. Particulates, pollutants, pesticides, and pathogens deposited from the air can degrade aquatic and terrestrial ecosystems and marine habitats. Discharges from power plants, sewage plants, and other industrial facilities are high in pollutants and pathogens.

Continued population growth increases the demand for transportation and utility facilities. The capacity of existing rail, air, and highway transportation systems will need to be increased to accommodate a growing population in the Bay Area (Caltrans 2016). The California Transportation Plan calls for an increase in intermodal transportation systems, including increased freeway reliability, express and high occupancy vehicle lanes, and increased connectivity between transportation types and across modes of transportation (Caltrans 2016). The majority of these connections will occur along existing transportation corridors and increase mobility between existing modes of transportation (Caltrans 2016).

The focus on improvements to existing corridors and connections between travel modes should minimize new habitat fragmentation from new state highways. However, new local roadways and other infrastructure has the potential to further fragment habitats (Section 2.4.5, *Loss of Habitat Connectivity*). In addition to habitat fragmentation, roads and traffic can result in direct mortality. According to Caltrans and California Highway Patrol statistics, there are about 1,000 reported accidents each year on state highways involving deer, other wildlife, and livestock (Shilling 2015, as cited in California Department of Fish and Wildlife 2015).

2.4.1.1 Effects on Focal Species and Habitats

All of the focal species are impacted by housing and urban development (Table 2-9). Population growth that leads to increased land conversion for housing, commercial, industrial, and other infrastructure has the potential to affect focal species in the following ways.

- Loss of habitat.
- Fragmentation of habitat and populations, leading to increased vulnerability and disruption of ecosystem functions.
- Exposure to and potential mortality from increased pollution and/or pathogens.
- Mortality associated with construction, transportation, recreation, or grazing.
- Changes in species behavior or distribution in response to disturbances such as noise and light.

Direct loss of habitat may be the easiest effect to measure, as land cover types that support focal species are converted to other uses. Focal species may lose foraging, breeding, nesting, or migration habitat that support various stages of their life cycle, resulting in a decline in population sizes. For example, California tiger salamander, California red-legged frog, and burrowing owl populations have experienced dramatic declines in the RCIS area due to widespread habitat loss and habitat fragmentation, resulting the conversion of grassland habitat to the urban uses described above (Gervais et al. 2008). In addition, burrowing owl has also lost suitable agricultural lands to development. Equally important for this species is the loss of burrowing habitat as fossorial rodents, such as ground squirrels, near developing areas where rodent populations are controlled.

Growth and development fragment habitats into small patches, isolating individuals with limited dispersal ability, and altering the remaining fragments. These smaller fragments often become dominated by species more tolerant of habitat disturbance, while less-tolerant species decline. Populations of less-mobile species often decline in smaller habitat patches due to reduced habitat quality, extreme weather events, or normal population fluctuations. Natural recovery following such declines is difficult for mobility-limited species. Such fragmentation also disrupts or alters important ecosystem functions, such as predator-prey relationships, competitive interactions, seed dispersal, plant pollination, and nutrient cycling (e.g., Bennett 1999, Environmental Law Institute 2003, as cited in the California Department of Fish and Wildlife 2015, Wang et al. 2015, Smith et al. 2018). Habitat fragmentation also has additional consequences, including the introduction and spread of invasive species, noise, and light pollution. The spread of dwellings into the wildlands interface has resulted in long-term fire suppression, resulting in a build-up of fuels and increased vulnerability of catastrophic fire (Section 2.4.6, *Disruption of Natural Fire Disturbance Regime*).

2.4.1.2 Effects on Other Conservation Elements

All of the other conservation elements in the RCIS area could be affected by land conversion, and the effects are similar to those described above for focal species (e.g., loss of habitat, fragmentation, exposure to pollution, direct mortality, and changes in behavior). These effects are described for impacts to working lands, habitats (i.e., unique land cover types, baylands, and soils), connectivity, and other important species (bats and ground squirrels).

Urban development can convert farmland and rangeland to urban uses, resulting in loss of habitat for species that use working lands and also livelihoods and cultures associated with working lands. Subdividing and developing parcels may result in the remaining undeveloped lands being too fragmented to be economically viable for larger scale operations, such rangelands for cattle. Small and fragmented working lands also provide less habitat value for the species supported by these habitats, as described above.

When new development converts natural and low-intensity agricultural habitats to developed or higher-intensity agricultural land, unique land cover types and serpentine soils may be lost. Additionally, a conversion to greater amounts of impervious surfaces (e.g., concrete or asphalt), can increase polluted runoff into streams, estuaries, and other waters. Particulates, pollutants, and pathogens deposited from the air can degrade aquatic and terrestrial ecosystems and marine habitats.

Habitat conversion may further isolate areas of remaining natural habitat, increasing the edge (i.e., boundary) and the distance between habitats, limiting habitat connectivity and wildlife linkages. For example, habitat fragmentation may disconnect streams and their tributaries, change hydrologic regimes, and limit or obstruct natural interactions between wetland systems. Fragmentation and associated land management activities like fire suppression modify the natural disturbance regime necessary to sustain the unique land cover types in the RCIS area.

2.4.2 Livestock, Farming, and Ranching

As described in the SWAP (California Department of Fish and Wildlife 2015), agriculture is essential major component of California's economy. Conversions of native habitat to agriculture across the state have been significant. Although agricultural lands no longer support native vegetation, they can provide important habitat for wildlife species, such crops like alfalfa that provides foraging habitat for Swainson's hawk. Livestock grazing is prevalent in the RCIS area. The effects of grazing on wildlife vary from beneficial to detrimental, depending upon how grazing is managed, including the timing (i.e., seasonality) and duration of grazing, and the type and number of livestock. These effects also depend on the relative sensitivities of individual wildlife species, because not all species respond the same way to grazing. Intensive grazing can be unsustainable in grasslands and other natural communities, by, destroying native vegetation and degrading streams. Well-managed livestock grazing, however, can benefit sensitive plant and animal species, particularly by controlling annual grasses and invasive plants in grasslands and other natural communities where these have become established. Livestock grazing is essential to conserving and managing focal species' habitats in the RCIS area.

Livestock, farming, and ranching include the following pressures that could impact focal species in the RCIS area.

- Agriculture effluents.
- Land conversion.

2.4.2.1 Effects on Focal Species and Habitats

All of the focal species are impacted by livestock, farming and ranching (Table 2-9). Agricultural practices can have a range of direct and indirect consequences to focal species and native biodiversity, positive or negative, based on timing, duration, and intensity. Different cropping systems (e.g., organic versus conventional farming, or highly diversified fields versus large monocultures) can have different levels of impacts to natural ecosystems across the landscape. Conversion of ranchland to row crops, for example, eliminates habitat for many grassland-adapted species. Agricultural land uses can result in the following effects, positive and negative, on focal species and their habitat.

- Air and water pollution of habitat.
- Sedimentation and water quality impacts.
- Habitat loss and fragmentation associated with land conversion.
- Mortality from harvesting and maintenance activities.
- Increase in available forage for some species.
- Control of invasive species and maintenance of open understory habitats.

Agricultural runoff with fertilizers and pesticides can pollute aquatic habitat. Rain and irrigation runoff carry silt and agricultural chemicals, degrading surface water quality and reaching groundwater. Herbicides and pesticides can have toxic effects on aquatic plants and animals (e.g., California tiger salamander, foothill yellow-legged frog [Center for Biological Diversity 2015], and focal fish species), and chemical contaminants can alter the ecological composition and chemistry of aquatic systems. For example, fertilizer runoff can increase growth of aquatic plants and algae, resulting in lowered oxygen levels when excessive plant matter decomposes. Application of rodenticides affects important keystone species such as ground squirrels, as well as predators that consume affected rodents.

Without proper management, intensive livestock grazing can also affect water quality, flows in streams, channel morphology, hydrology, riparian zone soils, in-stream and streambank vegetation, and aquatic and riparian wildlife. Livestock can consume and trample riparian plants, which decreases shade and can increase water temperatures, reducing habitat for focal fish species and other native species that depend on cool water. Some of these impacts can be reduced or eliminated by exclusionary fencing and other management practices.

Historic conversion of natural communities to agriculture is a leading cause of habitat loss and fragmentation in California (California Department of Fish and Wildlife 2015). Land conversion from one type of agriculture to another, including conversion of field and row crops or grazing lands to orchards or vineyards, can also affect focal species and native wildlife that use the existing crop. For example, field crops can provide foraging habitat for raptors, such as Swainson's hawk, and stock ponds can provide foraging and aquatic habitat for California red-legged frog, California tiger salamander, and tricolored blackbird. Conversion of field crops to orchards and vineyards dramatically reduces the quality of foraging habitat for Swainson's hawk and tricolored blackbird (California Department of Fish and Wildlife 2015). Farming practices can also affect wildlife movement, particularly where crops such as vineyards, are fenced to prevent access by wildlife.

Well-managed livestock grazing can benefit sensitive plant and animal species, particularly by controlling annual grasses and invasive plants in grasslands and other natural communities where these have become established. Well-managed livestock grazing is essential to conserving and managing focal species' habitats in the RCIS area (Larson et al. 2015). Ranching-wildlife conflicts, however, can result in direct mortality of wildlife. For example, eight of 11 adult mountain lion mortalities reported in the Wilmers et al. study (2013) in the Santa Cruz mountains were the result of depredations after mountain lion attacked livestock.

2.4.2.2 Effects on Other Conservation Elements

Working lands, which include farming and ranching, are identified as an important conservation element, and their value for conservation is described in Section 2.3.2, *Working Landscapes*. The conversion of natural habitat to agricultural lands can affect unique land cover types and soils.

Effects on unique land cover types include conversion of lands to agricultural uses and trampling and consumption of vegetation. Livestock grazing particularly can affect riparian areas because cattle congregate in these habitats for water. Furthermore, farm practices meant to promote food safety is influencing land-use practices that may be causing loss and degradation of riparian habitats (Gennet et al. 2013).

Soils can be affected as livestock trample stream channels, causing stream banks to collapse and soils to erode. Livestock can also cause erosion in heavily grazed area by reducing plant cover. Potential effects of erosion on focal species are described above. Some of these impacts can be reduced or eliminated by exclusionary fencing and other management practices.

2.4.3 Climate Change

Climate change is a major challenge to the conservation of natural resources in California and the RCIS area. Climatic changes are occurring in the state and have resulted in observed changes in natural systems. For example, small mammal distributions were found to shift upwards along an elevational gradient in Yosemite National Park, consistent with an increase in minimum changes in temperature over the last century (Moritz et al. 2008). Projected changes in climate, including extreme events such as fire, drought, flood, extreme temperatures, and storm events, are likely to have significant impacts on habitats, species, and human communities in the near future. Sea-level rise, drought, and flooding are discussed in the context of climate change.

2.4.3.1 Sea-Level Rise

The San Francisco Bay, which includes more than 1,000 miles of shoreline, is vulnerable to a range of natural hazards, including storms, extreme high tides, and rising sea levels resulting from global climate change. Sea level along the California coast has increased by about 15 centimeters (6 inches) over the last 100 years (California Energy Commission 2006), while the longest-running tide gauge in the nation, located in San Francisco Bay, indicates 2.01 millimeters (0.08 inches) of rise per year, or approximately 20.1 centimeters (0.66 feet) over the last 100 years (Largier et al. 2010). According to the National Research Council's 2012 sea-level rise projections for north-central California, 12 to 61 centimeters (4.7 to 24.0 inches) of sea-level rise is expected by 2050 and 42 to 167 centimeters (16.5 to 65.8 inches) is expected by 2100 (Hutto et al. 2015). A conservative estimate for the RCIS area is between 18 and 29 centimeters (7.1 and 11.4 inches) by 2050 (National Oceanic and Atmospheric Administration 2017). The number of acres vulnerable to flooding is expected to increase by 20 to 30% by 2100 in most parts of the San Francisco Bay Area, with some areas projected for increases over 40% (Maizlish et al. 2017).

With projected sea-level rise in the RCIS area, approximately 11,755 acres of land in Santa Clara will be vulnerable to flooding as compared to approximately 4,454 acres with no sea-level rise by 2050 (Cal-adapt 2017). The RCIS area has a relatively low level of vulnerability to sea-level rise and flooding as compared to other part of the San Francisco Bay Area (Cal-adapt 2017), given that only a small portion of the San Francisco Bay occurs in the northern RCIS area.

Urbanization in the northern RCIS area near the San Francisco Bay has resulted in the loss of, and major alterations to, tidal marsh habitat. The tidal-terrestrial transition zone, which occupies the gradient between the intertidal zone and terrestrial habitat (i.e., the transition between pickleweed-dominated salt marsh to salt pans and saltgrass) is one of the most heavily impacted San Francisco Bay ecosystems and is now limited to a narrow strips of land along the boundary of artificial levees (Beller et al. 2013).

Sea-level rise will have the most significant effect on tidal vegetation and other land cover types in the baylands natural community in the RCIS area. Marshes around San Francisco Bay are particularly vulnerable to the anticipated increase in sea-level rise. Coupled with limited natural sedimentation, marsh and mudflats may be unable to accrete quickly enough to keep pace with sea level rise, resulting in habitat conversion from marsh to mudflat and mudflat to open water. Areas for marshes to migrate inland are limited by adjacent development across much of the RCIS area. Ultimately, marshes may be reduced to narrow, fragmented habitat patches along the shoreline. The marshes currently serve an important ecosystem function of attenuating wave action and providing resilience to flooding; loss of the marsh habitat could exacerbate flooding. With remaining patches limited to fragments adjacent to developed areas, deleterious edge effects could be amplified (e.g., spread of invasive species and predators), and populations of marsh-supported species could become isolated and disconnected.

Sea-level rise will also affect the location, extent, and composition of non-tidal brackish marsh habitats along the tidal-terrestrial transition zone where it exists at or below current sea level because of increasing water elevation, increasing saltwater intrusion, and the tidal hydrologic regime. Non-tidal brackish perennial emergent wetland locations that exist at the water's edge will become more deeply immersed, or in the case of overtopped levees, deeply flooded by seawater. Plants such as saltgrass will be replaced by obligate wetland species such as bulrush. Where non-tidal freshwater marsh occurs in flooded depressions in upland areas adjacent to the baylands, those freshwater habitats will be inundated at least daily by tidal action and ultimately be lost (National Oceanic and Atmospheric Administration 2017).

Sea-level rise and changes in timing and volume of flow are projected to increase salinity intrusion into freshwater aquifers and the RCIS area. Estuarine inflows are projected to increase an average of about 20% from October through February and decrease by about 20% from March through September. Higher winter inflows could result in higher watershed runoff present in estuaries in winter, but reduced inflows in the spring and summer have the largest projected impact on estuarine waters reducing the amount of watershed runoff by a maximum of 8% by late June (California Department of Fish and Wildlife 2015).

2.4.3.2 Drought

Seasonal dry periods are a natural part of a Mediterranean climate system to which species and natural communities have adapted. However, a prolonged drought could cause serious impacts on focal species. Climate models predict that extreme climate events (e.g., really wet years or multi-year droughts) will increase in California and the RCIS area,[20] which can result in secondary impacts including wildfires and insect-pest outbreaks.

Whether drought causes a species to decline towards extinction depends on a number of factors, including how widely distributed the species is relative to extreme drought conditions, the degree to which microhabitats remain available to serve as refugia, and the ability for animals to relocate to less impacted areas. With adequate behavioral or genetic diversity and enough time, some animals can adapt to or evolve with changing conditions.

2.4.3.3 Wildfire

Climate change is expected to contribute to significant changes in fire regimes, including shifts in the timing, frequency, and intensity of wildfire events. Fire is a natural component of many ecosystems and natural community types, including grasslands, chaparral/northern coastal scrub, oak woodlands, and conifer woodlands. Under controlled conditions, prescribed fire is a valuable tool for managing fuel load, invasive species, and vegetation community structure. For each of these natural communities, fire frequency and intensity influence community regeneration, composition, and

[20] https://cal-adapt.org/tools/extended-drought/

extent. Although wildfire can provide beneficial ecosystem services, more frequent, intense fires could have grave effects on human development, particularly at the urban-wildlands interface. Wildfire can also negatively affect vegetative community composition by favoring early successional species. Frequent, intense fires could cause type conversion, increasing the extent of certain natural communities, such as grassland, at the expense of others, such as chaparral or oak woodlands.

CAL FIRE has rated the fire probability in undeveloped portions of the RCIS area as moderate to high. Recent fire history for large fires (>100 acres) indicates that there have been 37 large fires since 1951.[21] Large fires ranged from 101 acres to 5,813 acres. Of these, none were over 10,000 acres (i.e., catastrophic fires).[22] There were four fires that occurred either partly within the RCIS area or immediately adjacent (e.g., in State Parks lands) that were over 10,000 acres. These fires burned 112,242 acres, or 38% of the land cover types prone to wildfire (also referred to as "burnable land cover").

Wildfire frequency, size, and intensity are expected to increase throughout the RCIS area. Wildfire risk may increase four to six times the current conditions (California Department of Fish and Wildlife 2015). The number of escaped fires is projected to increase by 51%, while total area burned by contained fires is projected to increase 41% despite enhancement of fire suppression efforts (California Department of Fish and Wildlife 2015). The probability of large fires (>100 acres) is expected to increase by the end of the 21st century, and area burned is projected to increase from 10 to 50% by the 2070–2099 time period (PRBO Conservation Science 2011).

2.4.3.4 Effects on Focal Species and Habitats

All of the focal species are, or will likely be, affected by climate change (Table 2-9). Climate change may alter habitats in the RCIS area as temperatures and precipitation levels change, which could lead to the reduction in population sizes or extirpation of focal species that rely on those habitats or require focal species to migrate to other areas. Many of the focal species are of special conservation concern because of their risk of extinction, and are particularly vulnerable to climate change (California Department of Fish and Wildlife 2015). Some specific effects of climate change include the following.

- Extirpation or reduced population size due to habitat loss and fragmentation.
- Habitat loss, fragmentation, and decrease of habitat quality associated with land conversion due to change in precipitation and temperature regimes and increase in sea levels.
- Exposure to extreme weather.
- Change in species behavior or distribution in response to shifts in seasonal timing.
- Change of distribution of species in response to an increase in disturbance events and/or intensity of disturbance events such as wildfire or drought.

Species that are particularly vulnerable often occur within a limited geographic range, exist in small populations, have specialized habitat requirements, and have low dispersal ability, making it

[21] Calculations were based on data from 1956 to 2014.

[22] Catastrophic fires occurred as follows: 32,866 acres in 1961 (Bollinger Ridge), 13,128 acres in 1985 (Lexington), 18,500 acres in 2003 (Annie), and 47,748 acres in 2007 (Lick).

difficult for them to migrate to more suitable areas as habitats shift with climate change. For example, wildlife dependent on tidal habitats in the baylands will likely lose habitat to sea-level rise, as migration of tidal habitats is restricted by existing development.

Extended drought could have significant effects on the focal species and their habitats in the RCIS area, affecting habitat features such as vegetation, soil availability (for plants), and food resources, among other factors (PRBO Conservation Science 2011, Thorne et al. 2016, National Oceanic and Atmospheric Administration 2017). Climatic changes may be outside the range of historic variability or outside the range of suitable conditions for plants and animals, limiting their available habitat and resources through changes in temperature, precipitation, and disturbance events such as wildfire and drought.

Some of California's native species are more vulnerable to extended or frequent severe drought and may be at risk of extirpation. Small population size, short life expectancy relative to drought duration, and inability to cope with extreme events are reasons some taxa, including several of the focal species, are more vulnerable than others. Aquatic species are particularly at risk (e.g., California tiger salamander or California red-legged frog) of being extirpated by loss of aquatic breeding habitat during extended periods of drought. Under most climate change scenarios, the RCIS area will get hotter and drier, meaning that the ponds that are functioning well for species today may not function in the same way tomorrow. Shorter ponding durations may reduce reproductive success of species such as California tiger salamander and California red-legged frog if ponding durations become too short to successfully complete reproduction and emergence from aquatic habitats. Many adult amphibians can survive during periods of drought, but most require water for the egg and larval/tadpole life stages. Other, more terrestrial, species are only able to successfully breed when food, such as vegetation or prey species that feed on vegetation, is available for young (California Department of Fish and Wildlife 2015). Severe, extended absence of precipitation can lead to population declines through lack of development and survival of young. By identifying species most at risk from the effects of climate change, conservation and management efforts can be targeted to reduce and mitigate these impacts, such as by protecting and restoring existing habitat and linkages between habitats and climate change refuges, or through translocation.

The State Wildlife Action Plan (California Department of Fish and Wildlife 2015) identifies four of the focal wildlife species as climate vulnerable: both steelhead runs (Central California Coast steelhead and South-Central California Coast steelhead), California tiger salamander, foothill yellow-legged frog, and Swainson's hawk. Both DPSs of steelhead have been identified as extremely likely to become extinct in the wild before 2100 due to a decrease in cool, flowing water and an increase in alien fish over time (Moyle et al. 2012). Amphibians are particularly vulnerable to climate change, due to their reliance on aquatic or moist habitats. California tiger salamander is one of several species with an intermediate-to-high risk of extinction due to climate change because of a significant reduction in the suitability of occupied and potential habitat by 2050 (Wright et al. 2013). Foothill yellow-legged frog and California red-legged frog are also vulnerable to effects from climate change, though to a lesser extent, likely due to their dispersal ability and distribution of available future habitat (Wright et al. 2013). Other focal species will also be affected by climate change. For example, Gardali et al. (2012) identify Swainson's hawk as a species with moderate vulnerability to climate change because of its use of specific habitats and long-distance migratory patterns (i.e., the timing of their migration needs to align with suitable climate conditions).

Plants will also be affected by climate change. CDFW has identified the following focal plant species as highly (i.e., significant decline) or moderately (i.e., declining) vulnerable to climate change by 2050: fragrant fritillary, most beautiful jewelflower, smooth lessingia, and Mount Hamilton thistle. Climate vulnerability in plant species was found to be significantly related to anthropogenic barriers to dispersal, tolerance of a narrow range of temperatures, and changes in land use by humans in response to climate change (e.g., solar power stations, wind farms, geothermal wells, or biofuel production sites) (Anacker et al. 2012).

Focal species in the RCIS area could also be impacted by temporal changes that cause a mismatch in events that need to occur together or in a specified order. The timing of seasonal events, such as migration, flowering, and egg laying, may shift earlier or later. Such shifts may affect the timing and synchrony of events that must occur together, such as butterfly emergence and nectar availability. For example, callippe silverspot butterfly could be affected if butterfly emergence and nectar availability do not coincide due to shifts that occur as a response to climate changes. Other focal species could be more vulnerable to disease or predation if shifts occur in the timing of breeding or migration.

Range and distribution of focal species may shift (Walther et al. 2002).Historically, some focal species could shift their ranges across the landscape. Today, urban and rural development hinders the movement of many species across the landscape. Species or natural communities that occur only at high elevation (e.g., ponderosa pine woodland in the RCIS area) or within narrow environmental gradients (e.g., Mount Diablo fairy lantern) are particularly vulnerable to changing climate because they likely have nowhere to move if their habitat becomes less suitable (Thorne 2006).

Disturbance events, and/or the intensity of disturbance events, such as fire or drought, may increase. This could increase the distribution of disturbance-dependent land cover types, such as California annual grassland (Rogers and Westfall 2007). The result could be a net benefit to species that use disturbance-dependent land cover types, but possibly at the expense of organisms that rely on habitats that are more vulnerable to intense disturbance. An increase in the frequency and intensity of disturbance could increase the likelihood that these events will affect focal species, many of which are already quite rare.

Focal species-specific climate change-related stressors, vulnerabilities, and descriptions of how the RCIS provides opportunities for adaptation to climate change are described for each species or group of species in sections titled Opportunities for Adaptation to Climate Change in Chapter 3, *Conservation Strategy*, Section 3.6, *Conservation Strategy for Focal Species*.

2.4.3.5 Effects on Other Conservation Elements

Climate change will affect all other conservation elements but will most affect serpentine soils and unique land cover types, including baylands. The serpentine soils and unique land cover types in the are particularly at risk from climate change because of their narrow distribution. Development has increased stressors on these land cover types and will increase in the context of climate change. As the climate changes, the unique land cover types may shift in range and distribution in response. Given that serpentine land cover types and plants highly adapted to serpentine soils are restricted to serpentine soils, conservation of large patches of serpentine habitat is important to provide those areas with climate resiliency.

Some unique land cover types may be severely reduced in range and distribution or even extirpated with prolonged, extreme climate-driven events, such as a severe drought or increased fire frequency. In a climate change vulnerability assessment of California's terrestrial vegetation (Thorne et al. 2016), coastal salt marsh and freshwater marsh are unique land cover types in the RCIS area with high vulnerability to climate change. Several other unique land cover types such as California forest and woodland, coastal scrub, and California rock outcrop vegetation, are identified as have a high to moderate level of climate vulnerability.

Hotter, drier summers, combined with lower river flows, will further stress water resources available to people, wildlife, and vegetation. This is likely to translate into less water for wildlife, especially fish and wetland species. Lower river flows will allow saltwater intrusion into the rivers, increasing salinity and disrupting the complex food web of aquatic systems.

2.4.4 Non-native Species and Disease

This section provides background on each pressure and then summarizes how the consequent stressor impacts the focal species and other conservation elements. This section addresses the following.

- Non-native invasive plants.
- Non-native animals.
- Hybridization.
- Nuisance native animal species.
- Plant pathogens focused on Phytophthora spp.
- Amphibian and reptile diseases.

2.4.4.1 Non-native Species

Non-native plants can be found in many different habitats and tend to dominate brackish aquatic habitats. Invasive spartina and perennial pepperweed is a major concern in salt marshes, and opposite leaf Russian thistle (*Salsola australis*) appears to be increasing in some areas. Coastal habitats face alien species such as iceplant (*Carpobrotus edulis*)and pampas grass (*Cortaderia jubata*). Introduced plants also invade aquatic habitats. These aquatic invaders include species such as Brazilian water weed (*Egeria densa*), Eurasian milfoil (*Myriophyllum spicatum*), common water hyacinth (*Eichhornia crassipes*), musky marshpennywort (*Hydrocotyle moschata*), and parrot's feather (*Myriophyllum aquaticum*). In grasslands, some of the more challenging plant invaders include eucalyptus, fountaingrass (*Pennisetum setaceum*), gorse (*Spartium junceum*), medusa head (*Elymus caput-medusae*), tree of heaven (*Ailanthus altissima*), and yellow star thistle (*Centaurea solstitialis*). In riparian and wetland areas, invading plants include common fig (*Ficus carica*), giant reed, Himalayan blackberry, pampas grass, Russian olive (*Elaeagnus angustifoli*), tamarisk (*Tamarix ramosissima*), pennyroyal (*Mentha pulegium*), and tree of heaven (California Department of Fish and Wildlife 2015). Oak woodlands are invaded by plants such as Scotch broom (*Cytisus scoparius*) and French broom (*Genista monspessulana*).

Non-native fish and wildlife species are also extensive in California. Numerous non-native fish species have become established, dominating many of the rivers and streams in the region. Non-native fish species include, but are not limited to, striped bass (*Morone saxatilis*), white catfish, channel catfish, American shad (*Alosa sapidissima*), black crappie (*Pomoxis nigromaculatus*), largemouth bass, and bluegill. Many fish were historically introduced (via stocking) by federal and state resource agencies to provide sport fishing or forage fish to feed sport fish.

Non-native terrestrial animal species include European starling (*Sturnus vulgaris*), domestic dog (*Canis lupus familiaris*) and cat (*Felis catus*), red fox (*Vulpes vulpes*), Norway rat (*Rattus norvegicus*), and feral pig (*Sus scrofa*). Feral pigs are a major problem in many habitat types across the RCIS area. Feral pigs root in the soil, creating excessive soil disturbance, negatively affecting native plant communities. In oak woodlands, feral pigs can inhibit the germination and growth of young oaks by eating acorns and oak seedlings and removing leaf litter, causing soils to dry out (Bunn et al. 2005). In salt marsh habitats, the introduced red fox increases predation rates for sensitive coastal shorebirds such as Ridgway's rail. Populations of native avian predators, such as California gulls and corvids (i.e., raven, crows, and jays) have increased and are now having negative consequences in salt marshes in San Francisco Bay.

Non-native species may also hybridize with closely related native species, diluting the native composition of genes in populations. In the RCIS area, non-native barred tiger salamanders hybridize with native California tiger salamanders, reducing the distribution of fully native California tiger salamanders. Barred tiger salamanders (*Ambystoma mavortium*) were introduced to California over 50 years ago. The number and range of these non-native salamanders and their hybrid progeny have expanded since introduction, likely from introduction sites in the Salinas Valley (Fitzpatrick and Shaffer 2007).

2.4.4.2 Disease

Disease may be broadly defined as a physiological disturbance that compromises health. If applied on a wildlife population or ecosystem scale, it can be defined as a physiological disturbance resulting in disruption of demographic functions that compromise population or ecological health. If affected substantially by disease, wildlife and plant populations can become unhealthy, losing resilience and self-sustainability (California Department of Fish and Wildlife 2015). Several diseases are known to be problematic for some of the focal species in the RCIS area, which include diseases caused by *Phytophthora* species, chytrid fungus (could affect California red-legged frog, California tiger salamander, and foothill yellow-legged frog), and possibly ranavirus (could affect California tiger salamander). These diseases are discussed in more detail below.

Phytophthora species are microscopic water molds that live in soil and water (U.S. Fish and Wildlife Service 2015, Swiecki and Bernhardt 2018). Diseases caused by *Phytophthora* species include root rots, stem cankers, and blights of fruit and leaves. *Phytophthora ramorum*, which causes sudden oak death, was inadvertently introduced to California, likely through nursery stock was first recognized in the mid-1990s. Sudden oak death kills some oak species, primarily coast live oak and tanoak, among other native species, as well as many common horticultural plants. Sudden oak death has caused widespread morality of coast live oak and other oak species, with estimates ranging to approximately 50 million (Cobb 2018). *P. ramorum* thrives in the cool, moist climates of coastal evergreen forests and tanoak-redwood forests, and infestations have been found in Alameda and Contra Costa counties (California Oak Mortality Task Force 2019). Other species of *Phytophthora* kill or otherwise damage other native and ornamental vegetation in California; *P. cinnamomi,* for example, causes crown and root rot in many native and introduced woody species (Swiecki and Bernhardt 2018). *Phytophthora* can be spread by water and soil through water runoff, soil erosion, or through nursery container plants, as well as transferred by humans and vehicles (U.S. Fish and Wildlife Service 2015). Phytophthora species are naturally occurring throughout the RCIS area in urban environments, nurseries, restoration sites, and wildlands.

Chytrid fungus (*Batachochytrium dendrobatidis*), which causes the disease Chytridiomycosis, is one cause for large, global declines in amphibian populations (Stuart et al. 2004, Wake and Vredenburg 2008). *B. dendrobatidis* is found in water or soil and infects individual frogs or salamanders when their skin comes into contact with water containing chytrid spores in the RCIS area. The fungus kills infected animals by disrupting normal function of the skin (California Center for Amphibian Disease Control 2007). Disease outbreaks typically occur during the cooler months (October to February) and again postmetamorphosis (California Center for Amphibian Disease Control 2007). In some populations, the disease can cause 100 percent mortality while in others it causes only some deaths. Amphibians have been found to be infected by *B. dendrobatidis* in the RCIS area (e.g., Weinstein 2009, Sette et al. 2015), and a Chytridiomycosis mass mortality event of foothill yellow-legged frog within the Alameda Creek watershed occurred in 2013 (Adams et al. 2017). Some die-off events are unremarkable (i.e. < 10 dead animals observed) and can therefore be easily missed (California Center for Amphibian Disease Control 2007).

Ranavirus is an infectious disease of amphibians, reptiles, and fish caused by viruses from the genus *Ranavirus*. Ranaviruses are common in the RCIS area. One east bay study found that a third of tested amphibians and 67 percent of wetlands tested were positive for Ranaviruses (Tornabene et al. 2018). Ranaviruses are capable of infecting amphibians from at least 14 families and over 70 individual species (Miller et al. 2011). There are several different species of ranavirus that cause varying levels of disease in affected animals. Transmission of ranavirus occurs through direct contact, ingestion of the virus, ingestion of infected animals, or exposure to infected soil or water sources (Northeast Wildlife Disease Cooperative no date). Ranaviruses infect multiple cell types, often culminating in organ necrosis and massive hemorrhaging (Miller et al. 2011). Because ranaviruses most severely affect amphibians and reptiles in the larval stage, mortality events tend to be seasonal. In amphibians, mortality events due to ranavirus are most frequently seen in the spring and summer, while in turtles they are most common in the late summer and autumn. Though it is poorly understood at present, ranaviruses are believed to be able to persist in the environment for a period of time and can likely survive for months in water under favorable conditions. Ranavirus is believed to be the cause of several recent massive mortality events in amphibian populations across the globe. With a mortality rate of 90%-100%, the disease has the potential to eliminate entire species if not controlled. Ranavirus outbreaks can affect multiple species at the same time (Northeast Wildlife Disease Cooperative, no date). Mortality is often the only clinical finding reported in cases of ranaviral disease; however, erratic swimming, buoyancy problems, lethargy, and anorexia frequently occur. Translocation of infected amphibians through commercial trade (e.g., food, fish bait, pet industry) contributes to the spread of ranaviruses (Miller et al. 2011).

2.4.4.3 Effects on Focal Species and Habitats

Non-native species, native nuisance species, and diseases can affect all focal species in the RCIS area. These effects include the following, among others.

- Competition for resources.
- Loss and/or degradation of habitat.
- Competitive exclusion.
- Increased predation.
- Soil damage and erosion.
- Direct mortality, or reduced viability, from disease.
- Decreased fecundity or durability of hybridized populations.

While non-native invasive species, nuisance species, and disease have the potential to impact focal species both directly and indirectly, there are some known direct effects of these pressures on the RCIS focal species. These effects include the following.

- Many introduced non-native fish and amphibians out-compete native fish for food or space, prey on native fish (especially in early life stages), change the structure of aquatic habitats (increasing turbidity, for example, by their behaviors), and may spread diseases (Moyle 2002).
- Bass (*Micropterus* spp.)and bullfrog consume California red-legged frogs and California tiger salamanders and, as such, the presence of bullfrogs and bass limits the opportunity for success of these focal species.
- Non-native red foxes compete with and displace San Joaquin kit foxes (Lewis et al. 1993, U.S. Fish and Wildlife Service 2010b).
- Rooting disturbance from feral pigs allows non-native invasive plants to establish in grassland and aquatic communities (Sweitzer and Van Vuren 2002), making them unsuitable for the focal wildlife and plant species in the RCIS area.
- Hybrid tiger salamanders tend to be more aggressive than native California tiger salamanders and exhibit higher rates of predation on native salamanders than do California tiger salamanders (Ryan et al. 2009). Ryan et al. (2009) observed reduced rates of survival, growth, and development in native California tiger salamander larvae that co-occurred with non-native salamanders and their hybrid progeny. Competition with hybrid tiger salamanders may decrease survival in dry years (when ponds are more likely to dry before salamanders reach minimum size to metamorphose) (Werner 1986, in ICF International 2012). Native tiger salamanders emerging at smaller sizes may have lower adult fitness due to higher rates of desiccation and predation.

2.4.4.4 Effects on Other Conservation Elements

Invasive non-native plant and animal species affect the unique land cover types and serpentine soils in the RCIS area. Invasive plant and animal species outcompete and displace native plant communities. For example, the replacement of native grasses and herbs by fast-growing non-native annual grasses and forbs in serpentine grasslands has a profound effect on ecosystem functions

(Huenneke et al. 1990, U.S. Fish and Wildlife Service). In forested areas, invasive grasses can form dense stands that inhibit the germination of such coastal forest species as redwoods. Cape ivy (*Delairea odorata*) chokes out native vegetation with densely growing vines. Found most commonly in shady coastal lowlands, cape ivy also invades oak woodlands, riparian forests, coastal scrub, and Monterey pine forests (Bunn et al. 2005). Large accumulation of non-native plant biomass, particularly in aquatic systems, can change habitat (e.g. by converting open water to wetland habitat) or chemical processes, such as water quality. Exotic annual grasses grow faster, deplete the soil of nutrients, and reduce light availability.

Feral pigs can degrade unique land cover types from excessive use and rooting, which can lead to loss of emergent vegetation, erosion, and flooding. In oak woodlands, feral pigs can inhibit the germination and growth of young oaks by eating acorns and oak seedlings and removing leaf litter, causing soils to dry out (Bunn et al. 2005).

Plant diseases, such as those caused by *Phytophthora*, have potential to make widespread changes on the landscape, affecting numerous native plant communities. While oak woodlands have been a focus due to the presence of *P. ramorum* (i.e., sudden oak death) in the RCIS area, other unique land cover types, including scrubland and wetland habitats, have the potential to experience plant die off or increased vulnerability to climatic changes as a result of exposure to plant pathogens. The mortality of common woodland canopy species can have significant effects on the composition, structure, and habitat provided by these vegetation communities.

2.4.5 Loss of Habitat Connectivity

This RCIS identifies habitat connectivity as a conservation element (Section 2.3.1, *Habitat Connectivity*). The loss of habitat connectivity, including habitat fragmentation, can occur through the following ways, among others.

- Conversion of natural habitat to urban, suburban and agricultural uses (Section 2.4.1, *Housing and Urban Area* and Section 2.4.2, *Livestock, Farming, and Ranching*)
- Loss of habitat connection through climate change events, such as sea level rise (Section 2.4.3, *Climate Change*)
- Construction of linear structures like roads, canals, and power lines that impede movement

Growth and development can fragment habitats into small patches, which cannot support as many species as larger patches. These smaller fragments often become dominated by species more tolerant of habitat disturbance, while less-tolerant species decline. Fragmentation also disrupts or alters important ecosystem functions, such as predator-prey relationships, competitive interactions, seed dispersal, plant pollination, and nutrient cycling (California Department of Fish and Wildlife 2015).

Growth and development, along with associated linear structures like roads, canals, fencing, and power lines impede or prevent movement of a variety of animals. Loss or reduction of habitat connectivity makes it more difficult for wildlife to move across habitats and landscapes in search of food, shelter, and breeding or rearing habitat and to escape competitors and predators. Animals restricted to the ground, like mammals, reptiles, and amphibians, face barriers to movement such as roads, canals, and urban/suburban development. Attempts to cross these obstacles can be deadly, depending on the species and the nature of the barrier (four-lane highways with concrete median barriers compared to narrow, rural two-lane roads, for example).

Wildlife-vehicle collisions are a large and growing concern among public transportation departments, conservation organizations and agencies, and the driving public. Wildlife-vehicle collisions are a safety concern for drivers and a conservation concern for most animal species. Recently, Loss et al. (2014) estimated that between 89 and 340 million birds may die per year in the United States from collisions with vehicles. Many public transportation departments are trying different methods of reducing wildlife-vehicle collisions, including fencing roadways and providing crossing structures across the right-of-way to allow safe animal passage.

The California Roadkill Observation System[23] (CROS), a website created by UC Davis's Road Ecology Center (REC), records the locations of roadkill observations on major highways and freeways and includes records of carcasses cleaned up by the California Department of Transportation between 1987 and 2007. Using data from the CROS, the REC identifies stretches of California highways that are likely to be hotspots (i.e., stretches of highway that are statistically different from other stretches) for wildlife-vehicle collisions. The CROS accounts for both observed animal carcasses and traffic incidents, which can range from wildlife sightings on the roadway to wildlife-vehicle collisions. In the RCIS area, U.S. 101 and SR 17 were analyzed by the REC. One hotspot is identified along SR 17 near Los Gatos,[24] which is the longest, densest stretch with higher levels of wildlife-vehicle collisions. The remainder of U.S. 101 and SR 17 in the RCIS area have low incidences of wildlife-vehicle collision, with slightly higher rates in small, scattered locations along U.S. 101 in Central San José and near Morgan Hill. Most of the observations in the RCIS area are of medium (e.g., American badger, bobcat [*Lynx rufus*], coyote [*Canis latrans*], raccoon [*Procyon lotor*]) and large animals (e.g., feral pig, mountain lion, mule deer [*Odocoileus hemionus*]).

The Coyote Valley, a stretch of greenbelt between the San José and Morgan Hill, is recognized as an important region for landscape connectivity between the Santa Cruz Mountains and the Diablo Range (Thorne et al. 2006, Spencer et al. 2010, Penrod et al. 2013). Focused research in the Coyote Valley found the Monterey Road corridor to be the Coyote Valley's leading contributor to wildlife-vehicle collisions, with most of the documented roadkill on Monterey Road within the section between Metcalf Road and Bailey Avenue (Diamond and Snyder 2018).

2.4.5.1 Effects on Focal Species and Habitats

Loss of habitat connectivity affects all of the focal species in the RCIS area (Table 2-9). Effects include, but are not limited to, the following.

- Reduction in genetic diversity.
- Reduction in ability of populations to rebound after population declines.
- Extirpation of species.
- Reduced ability to colonize new areas of suitable habitat.

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[23] https://www.wildlifecrossing.net/california/

[24] Data from the CROS used in the analysis were collected between 2009 and 2015.

- Mortality from collision with vehicles.

Loss of connectivity between open space patches that provide habitat for focal species reduces their genetic pool due to the loss of the ability of populations to disperse and intermix. A diverse genetic pool is important for populations to adapt to changing environmental conditions, for disease resistance, and to minimize physiological and behavior problems (Falk et al. 2001). Populations of less mobile species often decline in smaller habitat patches because of reductions in habitat quality, extreme weather events, or normal population fluctuations. Natural recovery following such declines is difficult for mobility-limited species that may not be able to recolonize otherwise suitable habitat.

Barriers to movement could also extirpate local, smaller populations of focal species in the RCIS area. For example, breeding populations of Central California Coast steelhead and South-Central California Coast steelhead could be extirpated if these species are prevented from reaching spawning habitat. Habitat connectivity is also important for the focal plant species to be able to migrate in response to climate change. The loss of habitat connectivity would also restrict the focal plant and wildlife species from colonizing new areas of suitable habitat.

Roads pose a threat to species that are more susceptible to road-related impacts, such as road mortality and habitat fragmentation, from infrastructure (Brehme et al. 2018). Amphibians and reptiles are particularly susceptible to the negative effects of infrastructure, due to their small body size (thus making them less visible to drivers), reduced mobility (e.g., speed), and lack of behavioral avoidance of roads. Species such as mountain lion, California tiger salamander, and California red-legged frog, are at very high risk from the negative effects of roads (Brehme et al. 2018).

2.4.5.2 Effects on Other Conservation Elements

Loss of habitat connectivity affects wildlife linkages and unique land cover types. Loss of connectivity would further isolate populations in the increasingly fragmented landscape of the RCIS area. The loss of connectivity between areas containing serpentine soils and unique land cover types could reduce biodiversity and limit the ability of existing populations to adapt to changing conditions.

2.4.6 Disruption of Natural Fire Disturbance Regime

Periodic fire is an important influence on natural communities and focal species, especially the grassland and shrubland natural communities. Historically and prehistorically, fires caused by lightning strikes and human ignition kept woody vegetation from invading grassland (where the soil conditions are appropriate) and converting it to coastal scrub or oak woodland. Grassland was likely the dominant vegetation community, especially near prehistoric and historic settlements and travel routes, and in association with brush clearing for “rangeland improvements” to increase livestock forage (Reiner 2007, Tyler et al. 2007). Prehistoric burning apparently resulted in spatially patchy grasslands in a mosaic with woody vegetation (Keeley 2002). Grasslands were kept open by fire, drought, and possibly some influence of native grazers, such as tule elk and pronghorn. However, prior to Native American occupancy and their frequent burning, Ford and Hayes (2007) speculate that many of the grasslands within the range of coyote brush would have been brushlands. Today, in the absence of frequent extensive fire and moderate or higher intensity livestock grazing, the grasslands within the range of coyote brush have succeeded or will succeed in the future to northern coastal scrub and eventually mixed woodland, except on the hottest south-facing slopes and shallow soils (ICF International 2012). Similarly, chaparral and northern coastal scrub/Diablan sage scrub land cover types are dependent on periodic fires to maintain natural processes such as succession and regeneration. Periodic fires help increase native species diversity and reduce non-native species (ICF International 2012). Fire suppression can also allow woodland to encroach on and convert chaparral land cover types.

2.4.6.1 Effects on Focal Species and Habitats

Fire-suppression policies pose a threat to most of the focal species in the RCIS area to some extent (Table 2-9). Focal species could be affected through the following.

- Mortality from catastrophic fire that occurs due to the fuel load buildup.
- Water quality impacts following catastrophic fire.
- Conversion of habitat.
- Competition from invasive plants.
- Barriers to migration.
- Reduced conditions for propagation of fire-dependent species.

With buildup of fuel over many years, the risk of catastrophic fire is greatly increased (U.S. Fish and Wildlife Service 2002). Such a fire can kill focal wildlife species, which might otherwise be able to escape during a less extreme event. Following catastrophic fires, water quality is often reduced, as erosion increases due to the lack of vegetation. This increase in sediment and turbidity following fire, can have direct impacts on aquatic focal species, such as steelhead.

Prescribed burns can be an effective technique for managing invasive plant species that otherwise are difficult to control; fire suppression can allow invasive plant species to flourish, causing habitat quality to decline, creating barriers to movement (e.g., through thick vegetation), and increasing competition with native species. For example, callippe silverspot butterfly relies on grassland habitat that has historically been maintained through periodic fire (U.S. Fish and Wildlife Service 2009). With fire suppression, host plants can be out-competed by non-native species or the grassland habitat can convert to shrubland habitat. Additionally, species such as California tiger salamander and California red-legged frog may experience barriers to movement as grasslands are overgrown or converted. Focal plant species can also be greatly affected by habitat conversion and invasive plants. .

2.4.6.2 Effects on Other Conservation Elements

Fire can impact unique land cover types and soil, habitat connectivity, working lands, and other important species. Fire is a natural component of many natural communities and unique land cover types in the RCIS area. For example, many of the plants in the chaparral and northern coastal scrub communities have evolved to be dependent on periodic fire for regeneration (Holland 1986, Hanes 1988, Schoenherr 1992). In the extreme, communities dominated entirely by chamise cannot sustain themselves in the absence of fire (U.S. Fish and Wildlife Service 2002). Some species of chaparral have peeling bark or volatile oils that promote fire (Schoenherr 1992). Many of the dominant shrubs, such as manzanita and ceanothus, have adapted to fire by resprouting from basal burls or woody root crowns following a fire event. Other species have seeds that require fire to initiate growth (U.S. Fish and Wildlife Service 2002, Rundel and Gustavson 2005). Regrowth is triggered by removal of the overstory, typically by fire. Chemicals in smoke and charred wood also stimulate germination in a wide variety of native forbs that lie dormant as seeds in the soil for decades before a fire.

Ford and Hayes (2007) described the dynamic successional relationship between California grasslands and northern coastal scrub. Frequent fire, rodent herbivory, livestock grazing and trampling, and drought tend to maintain grassland and limit succession from grassland to northern coastal scrub as well as the succession from scrub to mixed oak woodland. Succession from grassland to scrub can be as rapid as >5% per year after suppression of fires or removal of livestock grazing, and succession from scrub to woodland can occur within 50 years after that. Returning such sites to grassland typically requires management that includes manual clearing and application of herbicides or repeated burning at times of maximum herbaceous understory and dry weather, followed by at least moderate intensity summer seasonal or yearlong livestock grazing (ICF International 2012).

Oak woodland is also a fire-adapted ecosystem, and fire has likely played a large role in maintaining this community type in the RCIS area. Fire creates the vegetation structure and composition typical of oak woodlands, and this natural community has experienced frequent, low-severity fires that maintain woodland or savanna conditions. In the absence of fire, the low or open understory that characterizes the land cover type can be lost. Ultimately, closed-canopy oak forests are replaced by shade-tolerant species because oaks cannot regenerate and compete in a shaded understory. Soil drought may also play a role in maintaining open-tree canopy in dry woodland habitat (ICF International 2012).

Fire suppression, leading to catastrophic fire can also lead to soil erosion, fragmentation of habitat, loss of working lands, and direct mortality to other important species.

2.4.7 Dams and Water Management/Water Use

Water resources are managed to meet water and power supply needs and to accommodate urban communities and agricultural production. Water infrastructure within the RCIS area is described in Section 2.1.3.1, *Water*, and shown on Figure 2-2.

Dams and water management structures are critical infrastructure for storing and transporting water supply for residential, commercial, and agricultural uses. Water is supplied to agriculture by diversion of surface water, by groundwater pumping, and through import from other regions via the State Water Project. Water management pressures in the RCIS area include water diversions, dams, flood control structures (e.g., levees and bank protection), groundwater pumping, stream and river crossings (e.g., culverts, bridges), and dredging.

Rivers and streams suffer from the historic and ongoing conversion of tributary waterways into constructed stormwater infrastructure. Stormwater conveyances are managed to convey urban runoff and floodwater and can alter the hydrologic processes that are important to ecosystem function, such as sediment deposition, water filtration, support of riparian vegetation, and wildlife movement corridors.

2.4.7.1 Effects on Focal Species and Habitats

Dams and water management/water use primarily affect aquatic species (Table 2-9). These effects include the following.

- Conversion of upstream habitat due to construction or expansion of dams.
- Alteration of natural hydrology.
- Barriers to aquatic and terrestrial wildlife movement through dams and linear water infrastructure (Section 2.4.5, *Loss of Habitat Connectivity*).
- Impacts to water quality through groundwater depletion.

Dams alter natural hydrology, potentially reducing the amount of water in streams that is needed by fish at critical times, such as during the spawning season when rainwater is captured behind the dam. Diminished flows reduce an aquatic system's capacity to discharge incoming contaminants and sediment. Reduced flows can have other significant effects on food webs, non-native species populations, and pollution concentrations downstream in the San Francisco Bay. Dams can be managed to benefit species by storing water and then releasing it at times when water is scarce, such as in the summer when rivers start to dry.

One major concern of dams and other in-channel features (such as weirs and culverts) is that they can be a partial or complete barrier to upstream and downstream migration by aquatic species such as steelhead and foothill yellow-legged frog. This reduces access to habitat, and in the case of anadromous fish, access to spawning habitat upstream. While fish ladders are built to improve passage around some dams, these are not always used effectively by fish and have limited utility for other aquatic species such as invertebrates.

Reservoirs can also serve as a barrier to terrestrial wildlife, such as mountain lion, that could potentially cross low flowing rivers, but are unable to cross the expanse of a reservoir. Similarly, infrastructure, such as water canals, can restrict movement of terrestrial wildlife.

Diversion of water for irrigation can alter hydrologic regimes, and nutrient-laden runoff can degrade aquatic habitat. As groundwater levels are depleted, saltwater intrusion increases, and flows reduced in streams and rivers. Groundwater depletion and drought have increased salinity in inland lakes and freshwater/brackish lagoons, which affects habitat conditions for native fish, amphibians, and other species (California Department of Fish and Wildlife 2015).

2.4.7.2 Effects on Other Conservation Elements

Unique land cover types and baylands habitats can be impacted by altered hydrologic regimes. The effects include the following.

- Isolation of flows from historic floodplains.
- Increased scope and incision of channels.
- Reduction of natural flood events and sediment transport.

Bridges, levees, and bank-protection structures on rivers and streams in the RCIS area prevent flood flows from entering historic floodplains and eliminate or alter the character of floodplain habitats, such as shaded riverine habitat, and floodplain ecosystem processes. Constrained flood-level flows increase scouring and incision of river channels and reduce or halt the formation of riparian habitat, channel meanders, and river oxbow channels (California Department of Fish and Wildlife 2015). In places where there are dams, the opposite can occur; dams can hold back extreme floods, reducing natural scour disturbance.

Sediment is also often trapped behind dams, leading to a reduction in sediment that is transferred downstream to replenish eroded areas and deltas. This sediment source is especially important in the light of sea level rise when downstream marshes in the Baylands will need to accrete sediment in order to keep pace with rising water levels.

2.4.8 Mining and Quarrying

Historic mercury mining operations are the primary mining and quarrying-related stressor in the RCIS area. These mines continue to affect water quality and native fauna and flora in many of the RCIS area streams and estuaries in the baylands (National Marine Fisheries Service 2016a).

2.4.8.1 Effects on Focal Species and Habitats

Historic mercury mines in the RCIS area primarily affect aquatic species (Table 2-9). Historic mercury mining operations have resulted in high levels of mercury in stream systems, affecting water quality, focal fish, amphibians, and other native species. In some streams, such as those in the Guadalupe watershed, mercury may be the greatest factor affecting salmonids and the native fish assemblage (National Marine Fisheries Service 2016a).

2.4.8.2 Effects on Other Conservation Elements

As described above, historic mercury mines primarily affect stream systems in the RCIS area. High concentrations of mercury in sediments affects water quality and native biodiversity in affected streams (National Marine Fisheries Service 2016a).

2.4.9 Airborne Pollutants

Particulates, pollutants, and pathogens deposited from the air can degrade aquatic and terrestrial ecosystems and estuarine habitats. Discharges from power plants, sewage plants, and other industrial facilities are high in pollutants and pathogens. Pollutants, primarily water pollutants, have been discussed in other sections above, including Section 2.4.1, *Housing and Urban Areas* and Section 2.4.2, *Livestock, Farming, and Ranching*. This section specifically mentions air pollutants, nitrogen in particular, not covered elsewhere. Other air pollutants, such as carbon dioxide and methane, can have effects on climate change patterns and associated effects as described in Section 2.4.3, *Climate Change*.

Nitrogen deposition from air pollution is ongoing and increasing (Weiss 1999, California Energy Commission 2006). Nitrogen deposition is predicted to continue to increase as population growth occurs in the RCIS area, which results in an increase in air pollutant emissions from passenger and commercial vehicles and other industrial and non-industrial sources (although it could possibly decrease if future automobile technologies address this issue). Emissions from these sources are known to increase airborne nitrogen, of which a certain amount is converted into forms that can fall to earth as depositional nitrogen.

2.4.9.1 Effects on Focal Species and Habitats

Air pollutants are identified for their effects on focal plant species and sensitive amphibians (Table 2-9). Effects include the following, among others.

- Increase in competition from non-native, invasive plants.
- Direct mortality of amphibians and increased rates of abnormalities or vulnerabilities to other stressors.

Nitrogen deposition has been shown to greatly increase available nitrogen in soils, and in turn, increase the success of plant invasions into serpentine areas (Weiss 1999). Non-native species overtake native serpentine species, including many of the serpentine-endemic focal plant species (e.g., most beautiful jewelflower, fragrant fritillary). Non-native plants may also compete with native plants for water, nutrients, light, and safe sites for germination, crowding out native plants (ICF International 2012). Serpentine areas that are grazed do not suffer as intense effects of plant invasions as ungrazed areas, most likely because cattle selectively graze invasive grasses and, in doing so effectively remove nitrogen from the site (Weiss 1999).

Chemical contaminants are considered a threat to focal amphibian, including California tiger salamander, California red-legged frog, and foothill yellow-legged frog (U.S. Fish and Wildlife Service 2002, U.S. Fish and Wildlife Service 2004). In the Central Valley, airborne pollutants are considered to be a likely cause of decline of amphibians (U.S. Fish and Wildlife Service 2002). While the sensitivity of these species to air pollutants is largely unknown, there is evidence to suggest that pesticide applications can result in larval die-offs, slow growth, and increased susceptibility to predation and viral infection (U.S. Fish and Wildlife Service 2017). There is also research demonstrating that nitrogen pollution specifically can be lethal to amphibians, as well as their prey sources, and also cause developmental anomalies (Rouse et al. 1999).

2.4.9.2 Effects on Other Conservation Elements

Nitrogen deposition can affect other conservation elements, notably unique land cover types, and serpentine soils, and serpentine grasslands in particular (Weiss 1999, 2006, ICF International 2012). California grasslands are believed to be among the most sensitive to nitrogen deposition (Fenn et al. 2010). Serpentine soils are inherently nutrient poor and are particularly limited in available nitrogen. Most serpentine-endemic plant species have evolved to tolerate this condition, while competitive invasive species have not done so (ICF International 2012). Nutrient deficiency is believed to be the primary mechanism by which serpentine soils retain a high degree of native diversity (Harrison 1999). Indirect impacts of continued nitrogen deposition on the unique land cover types and serpentine soils are anticipated to result from future urban development and rural development.

2.4.10 Tourism and Recreation

Outdoor recreation and positive experiences in nature are important to fostering an appreciation of nature. Intensive (e.g., over-use) or poorly managed recreation, however, could degrade habitats and directly and indirectly affect native biodiversity. With increased population growth, as described in Section 2.1, *Built Environment*, recreation and tourism will likely increase as well in the RCIS area. Tourism and recreation on public lands can have its greatest effect where densities of recreationists are high, such as in public parks (California Department of Fish and Wildlife 2015). The impacts of humans use with dogs can also negatively affect the environment (Hennings 2016), resulting in the following.

- Physical and temporal displacement.
- Disturbance and stress.
- Indirect and direct morality.
- Health issues and water quality impacts.

2.4.10.1 Effects on Focal Species and Habitats

Tourism and recreation may affect some focal species (Table 2-9), though the actual extent of effects will be specific to those species present near recreation. These effects could include the following.

- Direct mortality due to trampling, fishing, or wildflower picking.
- Impaired water quality or habitat conditions due to erosion.
- Introduction and spread of non-native species and diseases (Section 2.4.4, *Non-native Species and Disease*).
- Alteration of behavior, including reduced reproductive success.
- Ignition of wildfire.
- Trash dumping.

Direct mortality can occur as focal fish species are caught by people fishing. Additionally, recreationists may trample California tiger salamander migrating to aquatic habitat, as well has trample vegetation, including the focal plant species in otherwise suitable habitat.

Off-trail use and camping in undesignated areas can degrade habitats by reducing vegetative cover, compacting soil and increasing rates of soil erosion, increasing the spread of invasive species and diseases (California Department of Fish and Wildlife 2015). Campgrounds can be the source of sparks that ignite wildfire. Recreationalists can also increase trash and food sources which can make focal wildlife more likely to be attracted to areas of human activity and thus more likely to be hit by vehicles. Focal wildlife can also be killed by consuming trash.

2.4.10.2 Effects on Other Conservation Elements

Unique land cover types, including baylands, and soils can be impacted by increased recreation. Large numbers of outdoor recreationists in sensitive areas can directly damage natural systems by reducing vegetative cover, compacting soil, increasing soil destabilization and erosion, contaminating natural lands and waterways through inappropriate disposal of trash and human and pet waste, and by introducing non-native species. Natural areas may be indirectly affected by increased development of recreational access points and supporting infrastructure such as roads, construction and use of visitor facilities and campgrounds. Visitor litter in parks and public lands can encourage increased corvid populations (jay, crow, and raven), which contributes to greater competition with and predation upon other native wildlife (California Department of Fish and Wildlife 2015).

Concentrated recreational use in highly sensitive areas, such as streams and riparian zones by hikers, picnickers, mountain bikers, and equestrians can damage these systems, reducing vegetative cover and disturbing sensitive natural communities. Concentrated fishing, especially in populated area can lead to localized depletion of fisheries. Illegal trampling, and collecting, can deplete floral and faunal populations, reduce biodiversity, and alter trophic and community structures in frequently visited natural habitats (California Department of Fish and Wildlife 2015).

2.5 Gaps in Scientific Information

The conservation strategy presented in Chapter 3, *Conservation Strategy*, is based on the best available scientific information. However, there are many gaps in that information, even in the RCIS area, which has been heavily studied. This section includes a discussion about information gaps that, if filled, could change the objectives, actions, and priorities in the conservation strategy. Gaps can be created from a lack of information or by shortcomings in how information is disseminated.

2.5.1 Focal Species Occurrence Data

The California Natural Diversity Database (California Department of Fish and Wildlife, California Natural Diversity Database 2019) was the primary source of species occurrence data, along with a few others. While the data are considered high quality, because of the verification process used by CDFW, there are two inherent gaps. First, only positive data are presented (i.e., where an occurrence is found). While positive occurrence data are very useful, there is no way to know where surveys have been conducted for each species with negative survey results (i.e., where an occurrence was not detected). Knowing where species do not occur, in habitat that may appear suitable, is also important for informing where to prioritize conservation actions. Because that information is not available, the species habitat models typically over-predict where species may occur. With negative survey data, those models could be refined by removing areas that had been surveyed where no species were found.

Second, the CNDDB does not include data for large areas of potentially suitable habitat, in part because a large amount of the RCIS area has never been surveyed. Specifically, the northeastern portion of Santa Clara County had not been extensively surveyed. This area is predominantly private land, and access for survey efforts may be limited. Oftentimes, surveys are driven by environmental compliance for projects. For example, many CNDDB occurrences fall along gas and electric rights-of-way or roadways; places where infrastructure projects typically happen. As a result, conservation and mitigation projects often focus on limited areas with suitable occurrence data, potentially at the expense of other important areas that are occupied by target species but have not been surveyed.

2.5.2 Rare Plant Distribution

The gaps in survey effort for species is discussed above in Section 2.5.1, *Focal Species Occurrence Data*, but the lack of survey data for rare plant species is an issue throughout the state. Plant species are under-surveyed for two reasons: 1) lack of access to private lands, and 2) plants are not state or federally listed as threatened or endangered at the same rate as wildlife, and therefore regulatory triggers are not in place to require surveys as frequently. Furthermore, when botanical surveys are done in areas, protocols which involve multiple surveys across the full range of blooming periods are often not completed and some species could be missed if they are not flowering at that time.

The lack of survey data for many rare plant species consequently limits planning efforts. For example, the few occurrence data for rock sanicle, Tracy's eriastrum, and Congdon's spikeweed limit the identification of priority conservation areas. More surveys on private lands and standardized survey efforts would help fill this data gap and allow for more informed conservation priorities for focal and non-focal plant species.

2.5.3 Wildlife Movement

There has been more study of wildlife movement in the RCIS area than most places in the country. Over the last decade, researchers have monitored animal movements across Coyote Valley, in the Santa Cruz Mountains, and throughout the Pajaro River Watershed (Section 2.3.1, *Habitat Connectivity*). There is a gap in wildlife movement data in the eastern portion of the RCIS area. Specifically, information is lacking about how animals move across SR 152, an assumed barrier to north-south movement. There are only a few locations where animals are likely to cross, so aligning land acquisition with those crossing locations make sense. Knowing more about which crossings are most important would allow conservation organizations to focus land acquisition and management in the most critical locations.

2.5.4 Pond Functionality and Longevity

Several focal species rely on freshwater wetland habitat for at least part of their life cycle (i.e., California tiger salamander, California red-legged frog, tricolored blackbird). In the RCIS area, most of the freshwater wetlands are human-made stock ponds. Stock ponds are widely distributed across the RCIS area, especially east of the Santa Clara Valley in the Diablo Range, where ranching has been a dominant land use for centuries. Like other wetlands, ponding duration and timing are important factors that affect habitat quality. Under most climate change scenarios, the RCIS area will get hotter and drier. That means that ponds, which primarily rely on surface runoff, will receive less water and dry up sooner in a typical year. At the very least, rainfall patterns, both the timing and amount, are likely to change, meaning that the ponds that are functioning well for species today may not function in the same way tomorrow. Shorter ponding durations may reduce reproductive success of species such as California tiger salamander and California red-legged frog if ponding durations become too short to successfully complete reproduction and emergence from aquatic habitats. Understanding existing and future ponding durations under different climate change scenarios can inform land management and pond restoration and creation efforts in ways that may buffer aquatic species from the effects of climate change. For example, new ponds may need to be supported by well water or other sources of reliably available water or designed to increase water storage capacity or retention while providing suitable habitat features. Vegetation may also need to be managed differently to maintain open water habitats in warmer, drier conditions.

Little is known about pond functionality and longevity for many of the ponds in the RCIS area that provide habitat for California tiger salamander, California red-legged frog, and other native species. A systematic survey of the pond resources, with an emphasis on their ability to provide habitat functionality for native species, would greatly inform how to prioritize land acquisitions and restoration and enhancement actions on private and public lands. An NCCP Land Assistance Grant sponsored by CDFW is funding research on pond hydroperiod in the Coyote Valley.[25] Goals of this research are to identify ponds and impoundments that are most sensitive to climate change, develop a hydroperiod assessment tool that can be used to prioritize protection and management of sensitive aquatic habitat, and develop a hydroperiod dataset and assessment tool that can be used to control the spread of hybrid tiger salamanders and bullfrogs.

Grazing is widespread, but the use of grazing as a management tool is still variable, particularly to manage pond vegetation. Santa Clara County Parks and the Santa Clara Valley Open Space Authority allow grazing on most of their lands. Yet, California State Parks does not allow grazing on the Henry W. Coe State Park. Without grazing, ponds often fall into disrepair, fill with sediment, and fail. This reduces the habitat quality for focal and non-focal species over time. A better understanding of the conditions of ponds could inform the use of grazing to manage habitat features in ponds.

2.5.5 California Ground Squirrel Distribution

Many native species in California, and in particular in the RCIS area, rely on California ground squirrels as an important element of their life history. California tiger salamanders and burrowing owls rely on ground squirrels, and other fossorial mammals, to provide underground refugia and nest sites, respectively. Many species of raptors and mammals rely on ground squirrels as a food source. If the distribution of ground squirrels in the RCIS area was better understood, it would allow for the refinement of species habitat models and ultimately could influence where conservation priorities are located.

2.5.6 California Tiger Salamander Hybridization

California tiger salamanders hybridize with invasive barred tiger salamanders in the RCIS area, resulting in a reduction in the numbers of fully native California tiger salamanders. The larger, more aggressive hybrid animals routinely outcompete the native species, furthering the decline of an already rare species. Work is ongoing to understand the prevalence of hybridization in the RCIS area, and throughout the species' range, but there is still a large gap in knowledge. Fully understanding the distribution of hybrids is the first step. The level of hybridization, and extent of introgression of non-native tiger salamander genes into California tiger salamanders varies, and some level of hybridization can likely be tolerated in the native population without significantly altering ecological function (Searcy et al. 2016). While the ideal scenario is to preserve native populations, it may not be feasible for populations of California tiger salamander that have already hybridized with barred tiger salamander. Experimental evidence suggests that hybrids with relatively lower levels of barred tiger salamander genes are ecologically equivalent to fully native California tiger salamanders, and should be protected alongside native California tiger salamanders (Searcy et al. 2016). More research is needed to identify the threshold of non-native genetic introgression below which hybrids should be retained, and above-which hybrids should be removed. Understanding that balance, so that management and monitoring can be designed to respond, is imperative.

[25] https://www.wildlife.ca.gov/Conservation/Planning/NCCP/Grant-Funded-Projects#Local

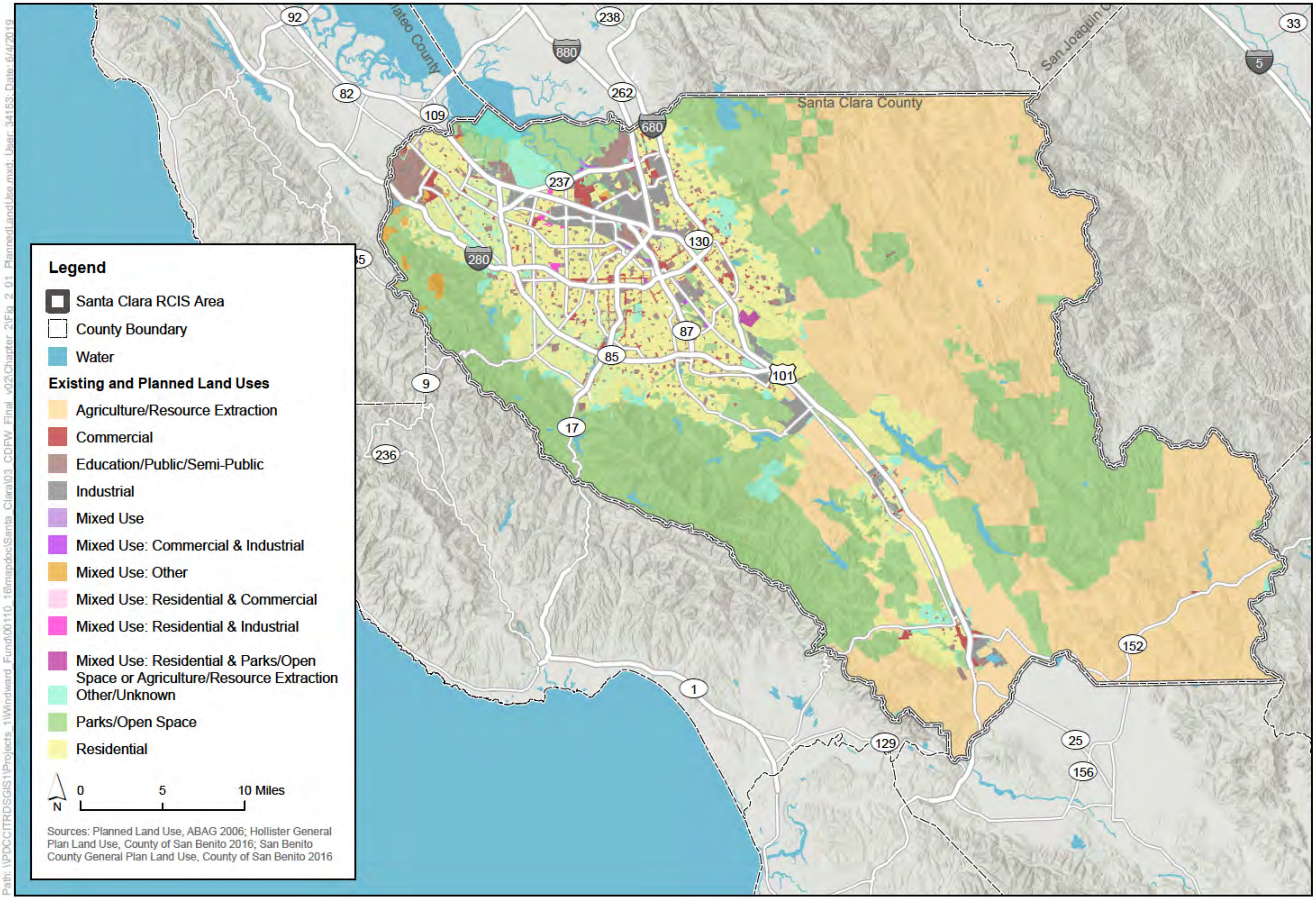

Figure 2-1
Existing and Planned Land Uses in the RCIS Area

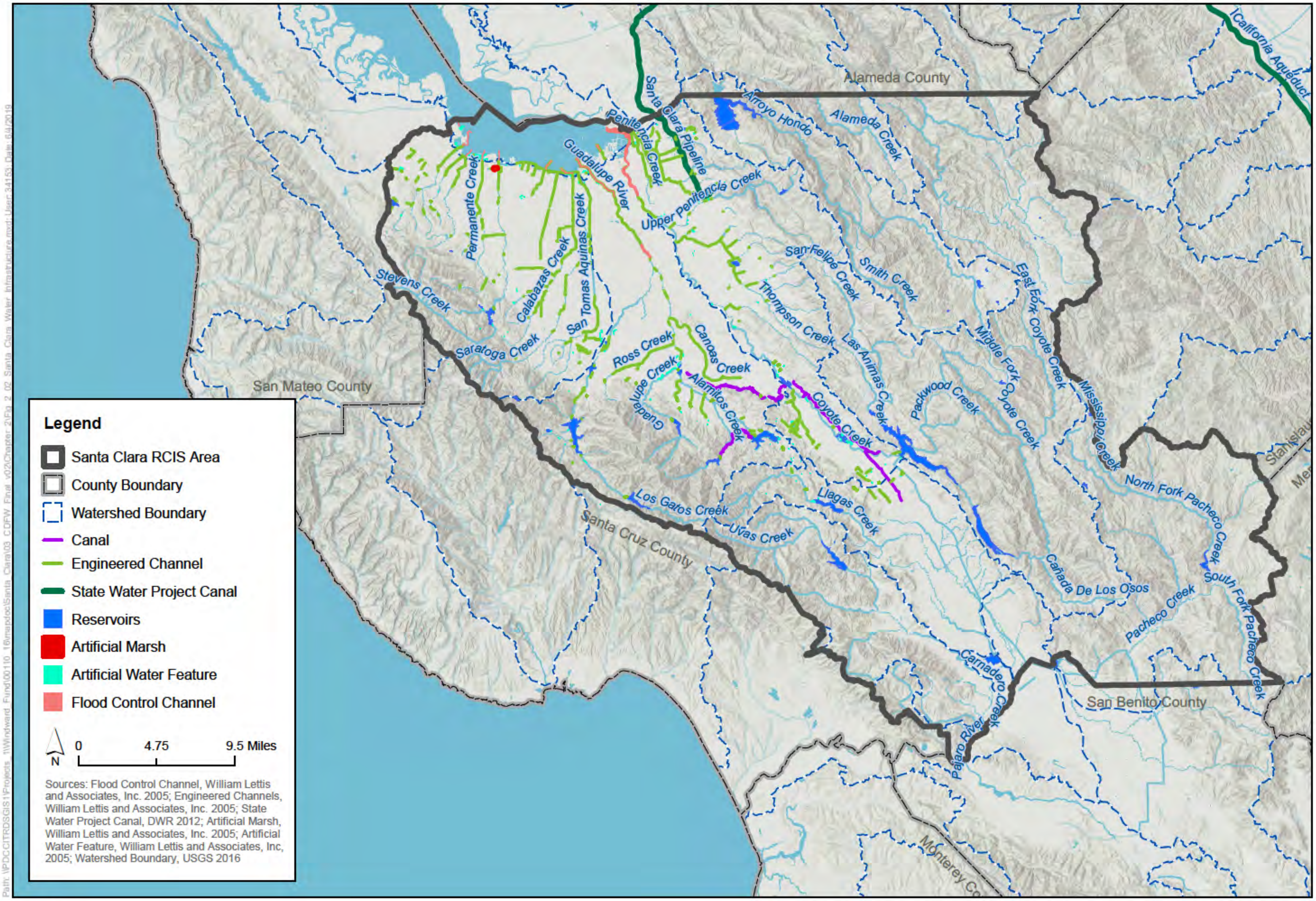

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Figure 2-2
Major Water Infrastructure within the RCIS Area

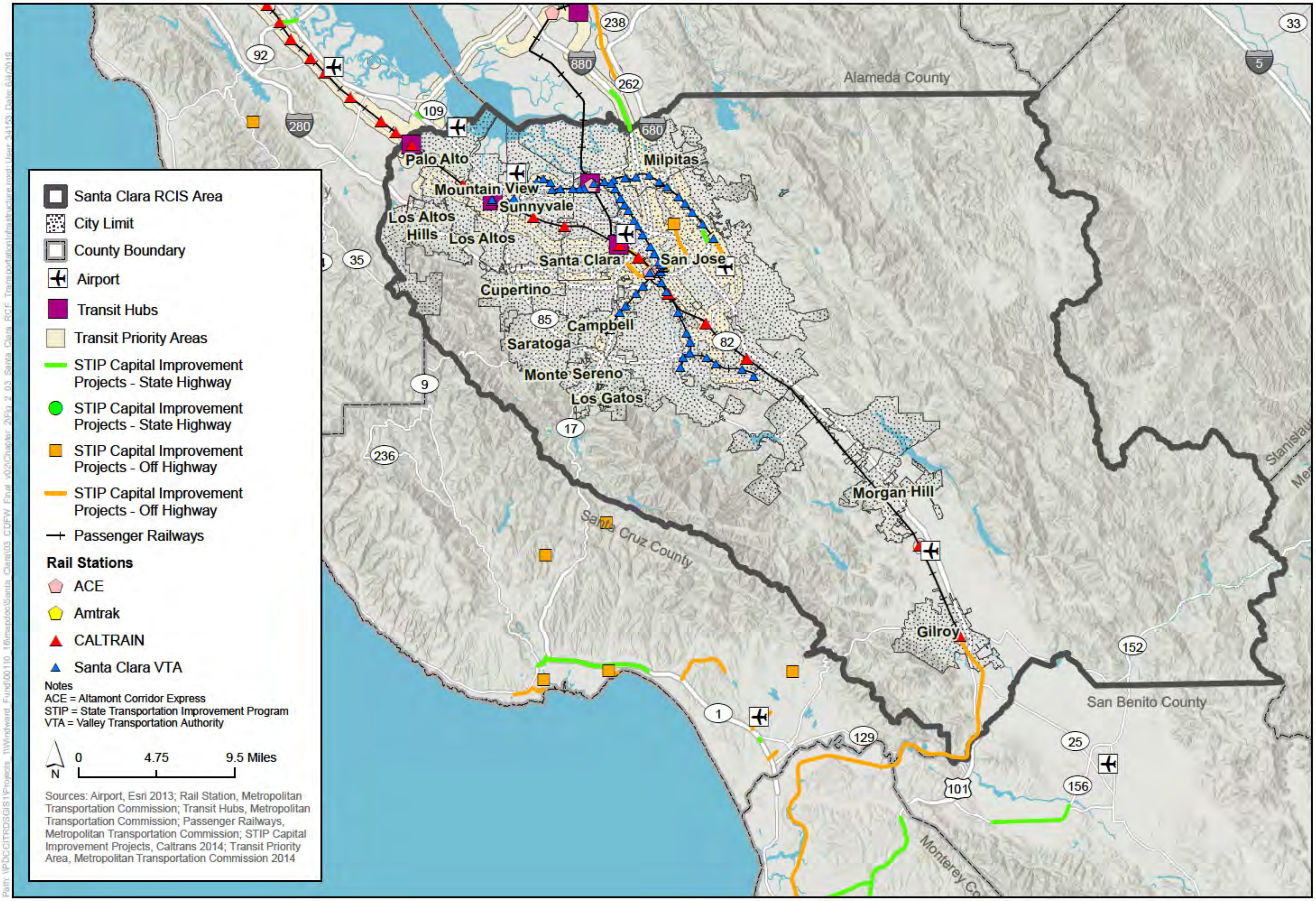

Figure 2-3
Major Transportation Infrastructure within the RCIS Area

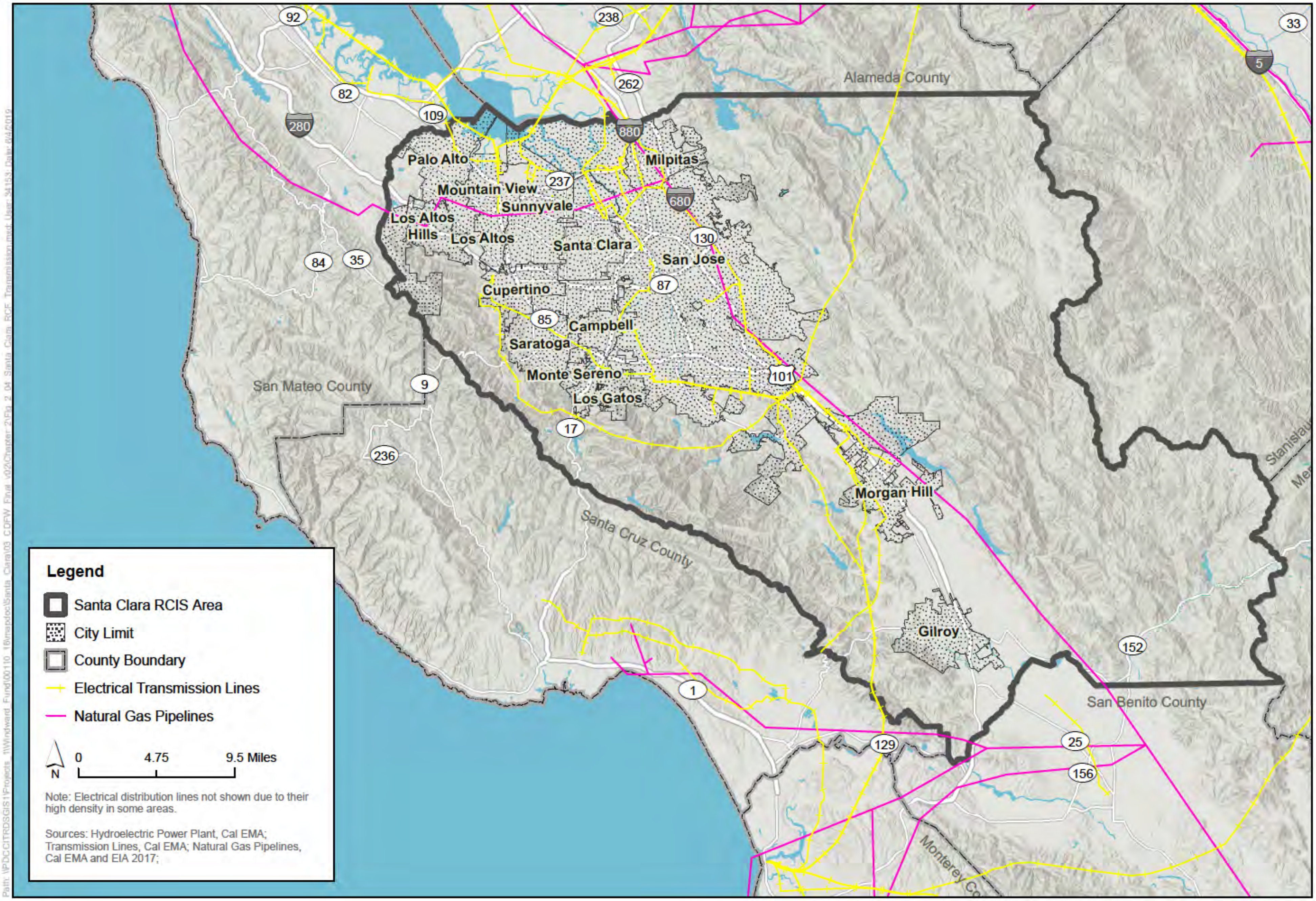

Figure 2-4
Major Electrical Transmission Facilities within the RCIS Area

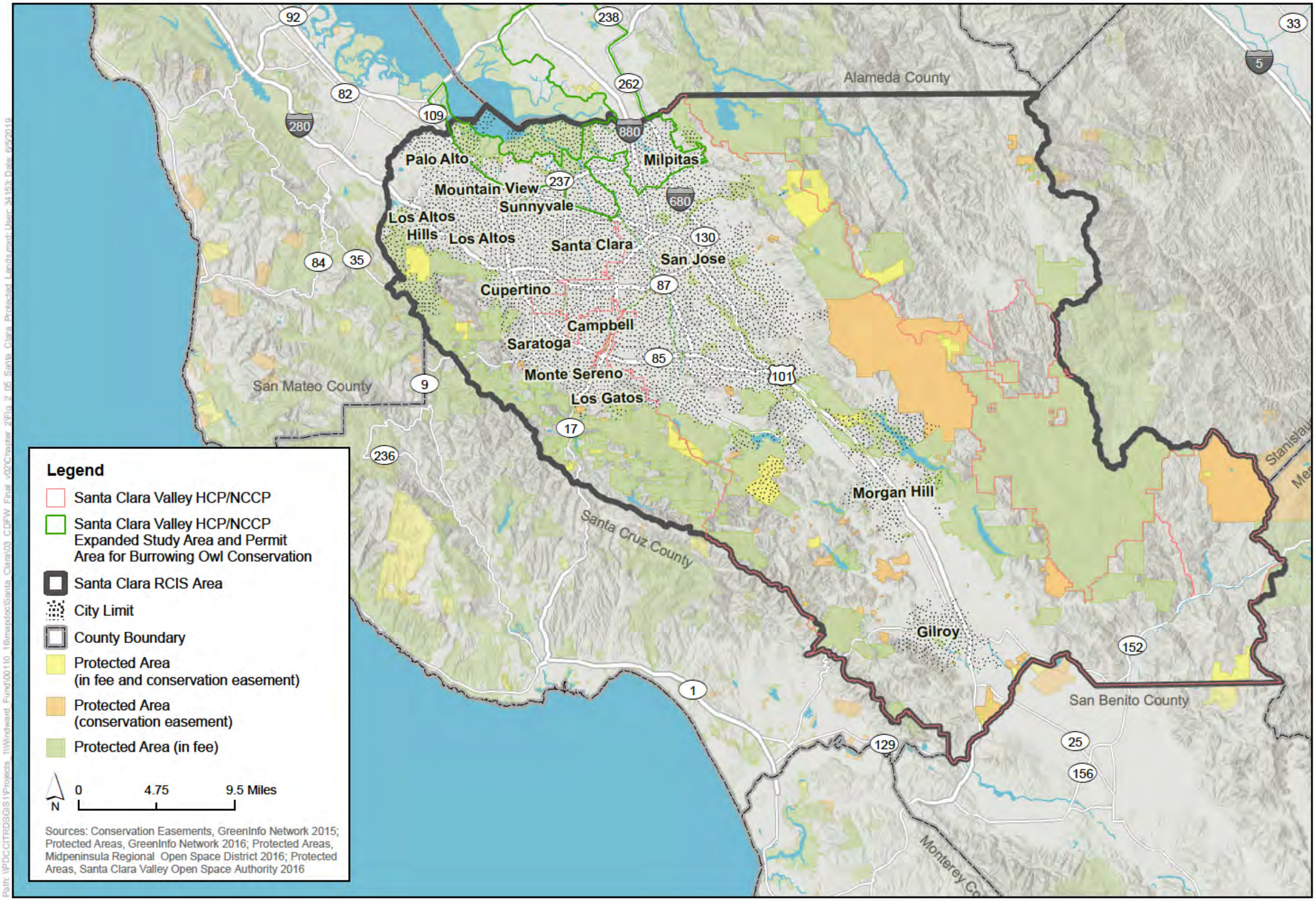

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Figure 2-5
Protected Areas within and Adjacent to the RCIS Area

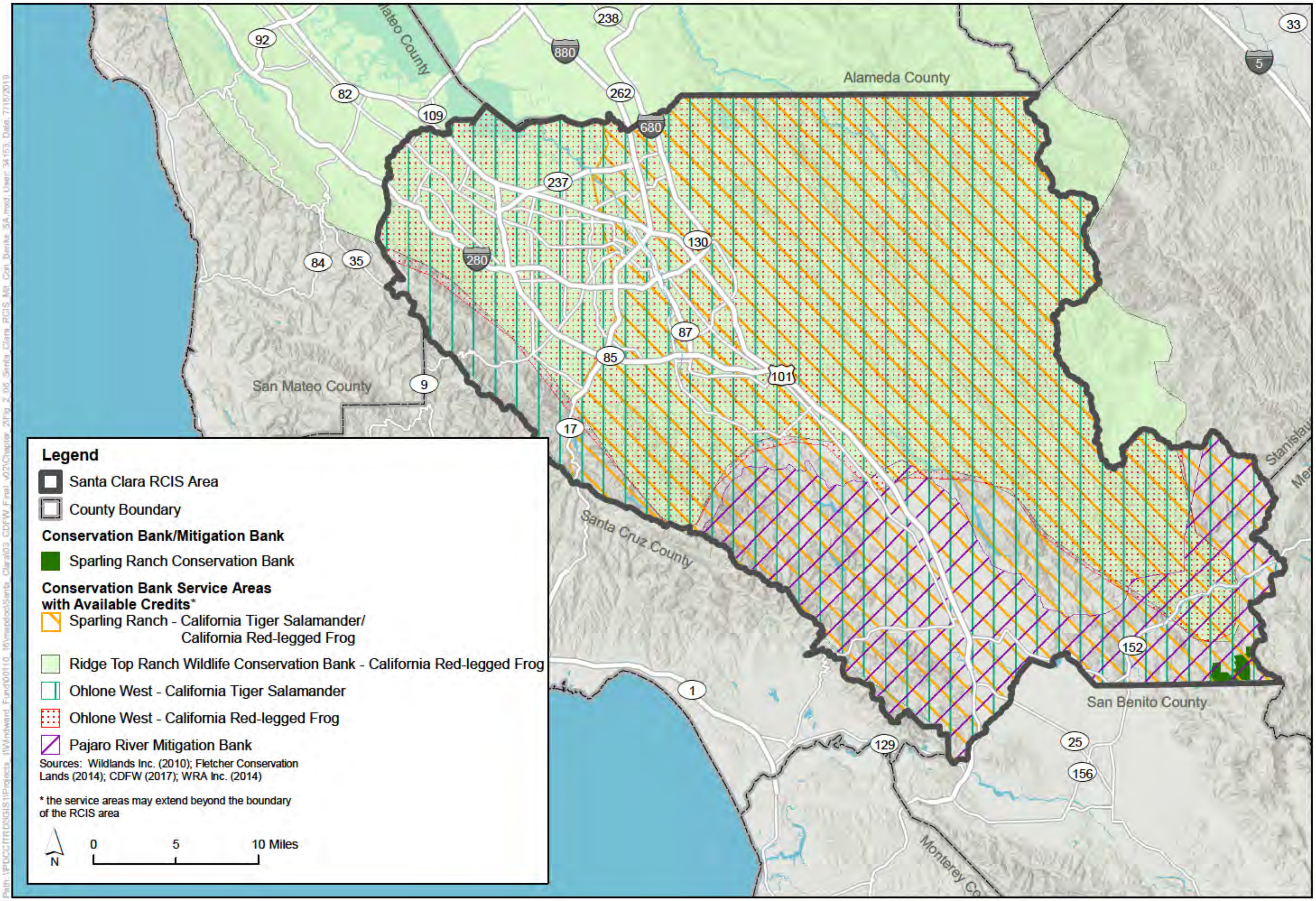

Figure 2-6
Mitigation and Conservation Bank Service Areas with Available Credits Overlapping the RCIS Area

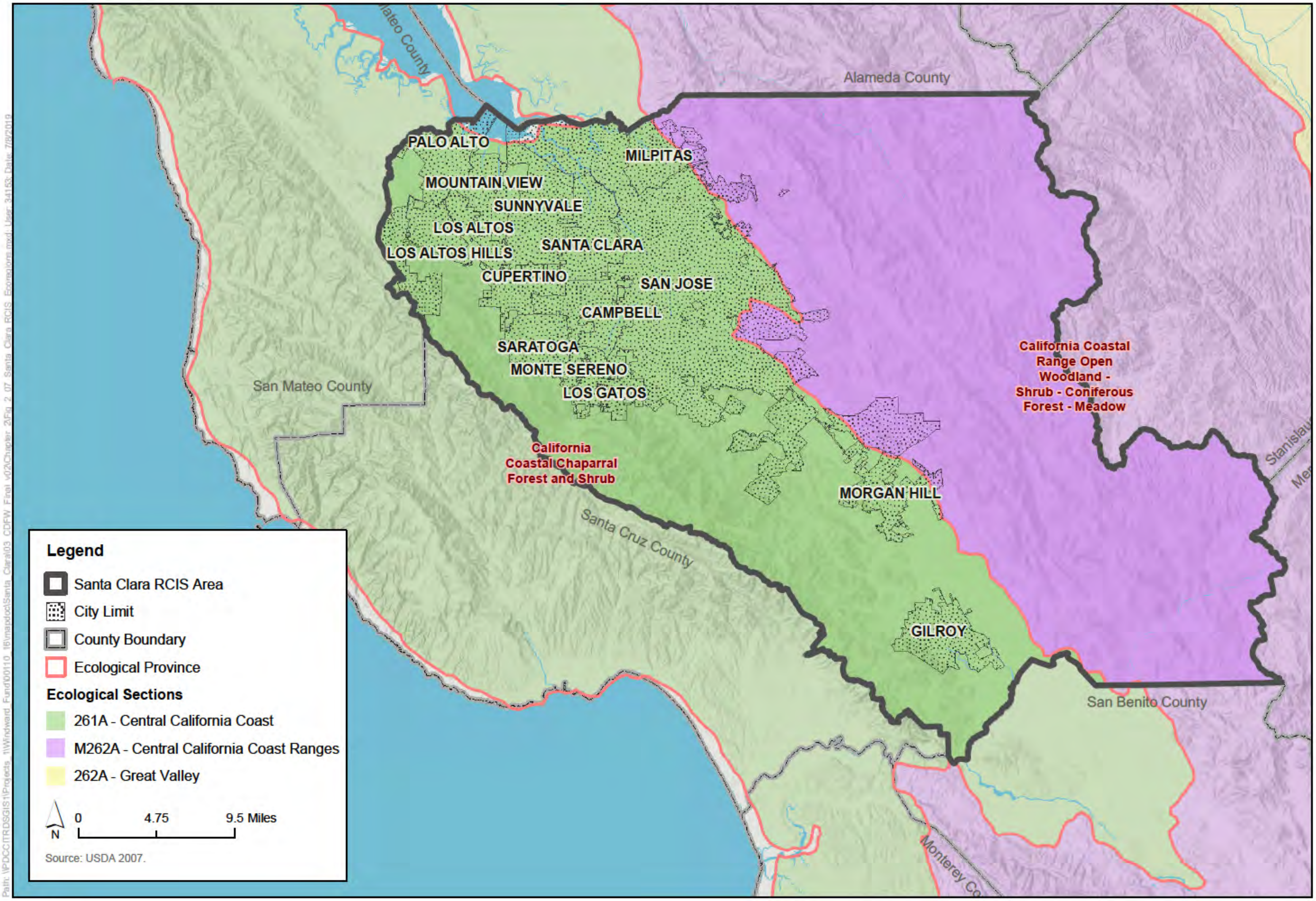

Figure 2-7
Ecoregions of the RCIS Area

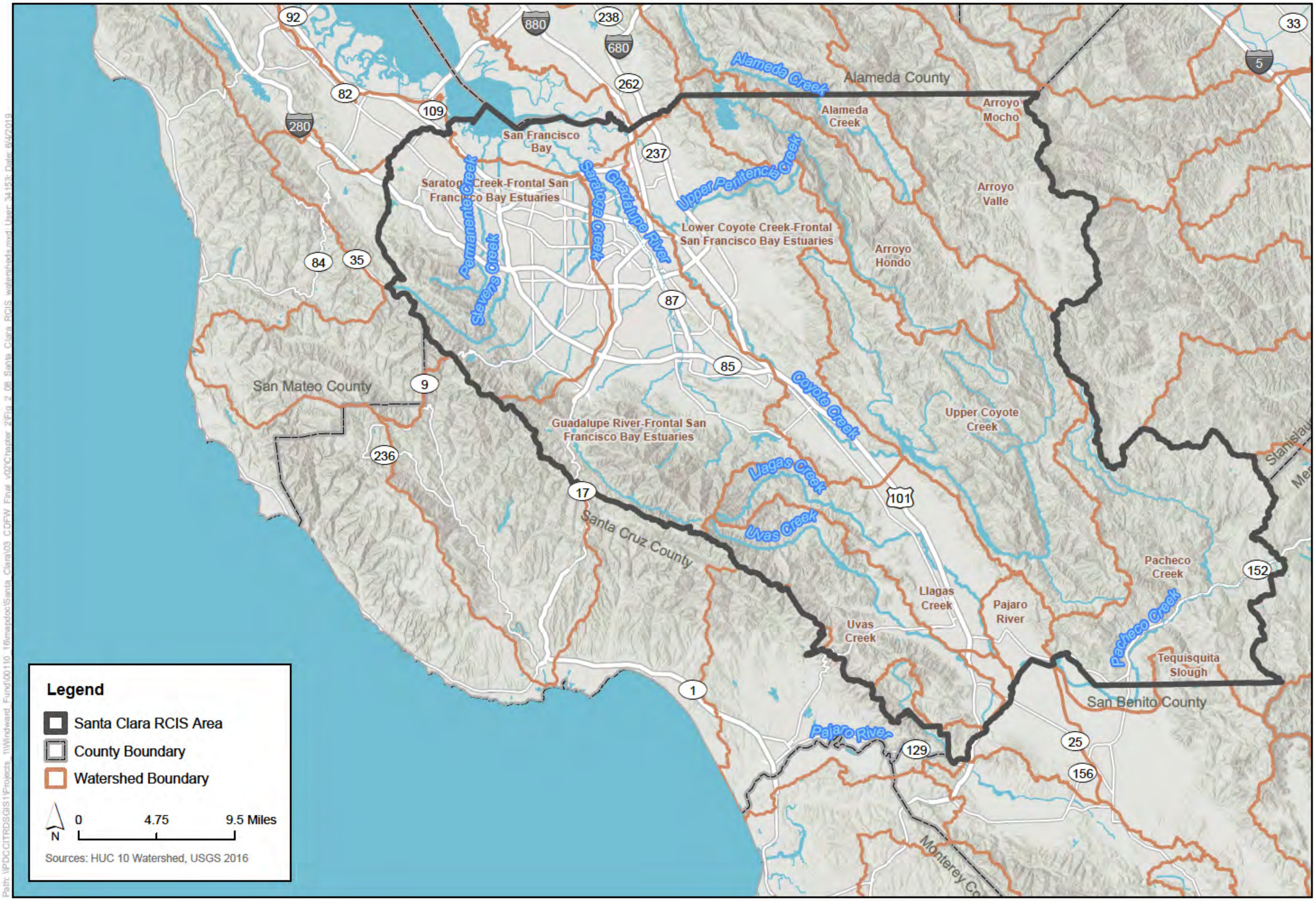

Figure 2-8
Major Watersheds of the RCIS Area

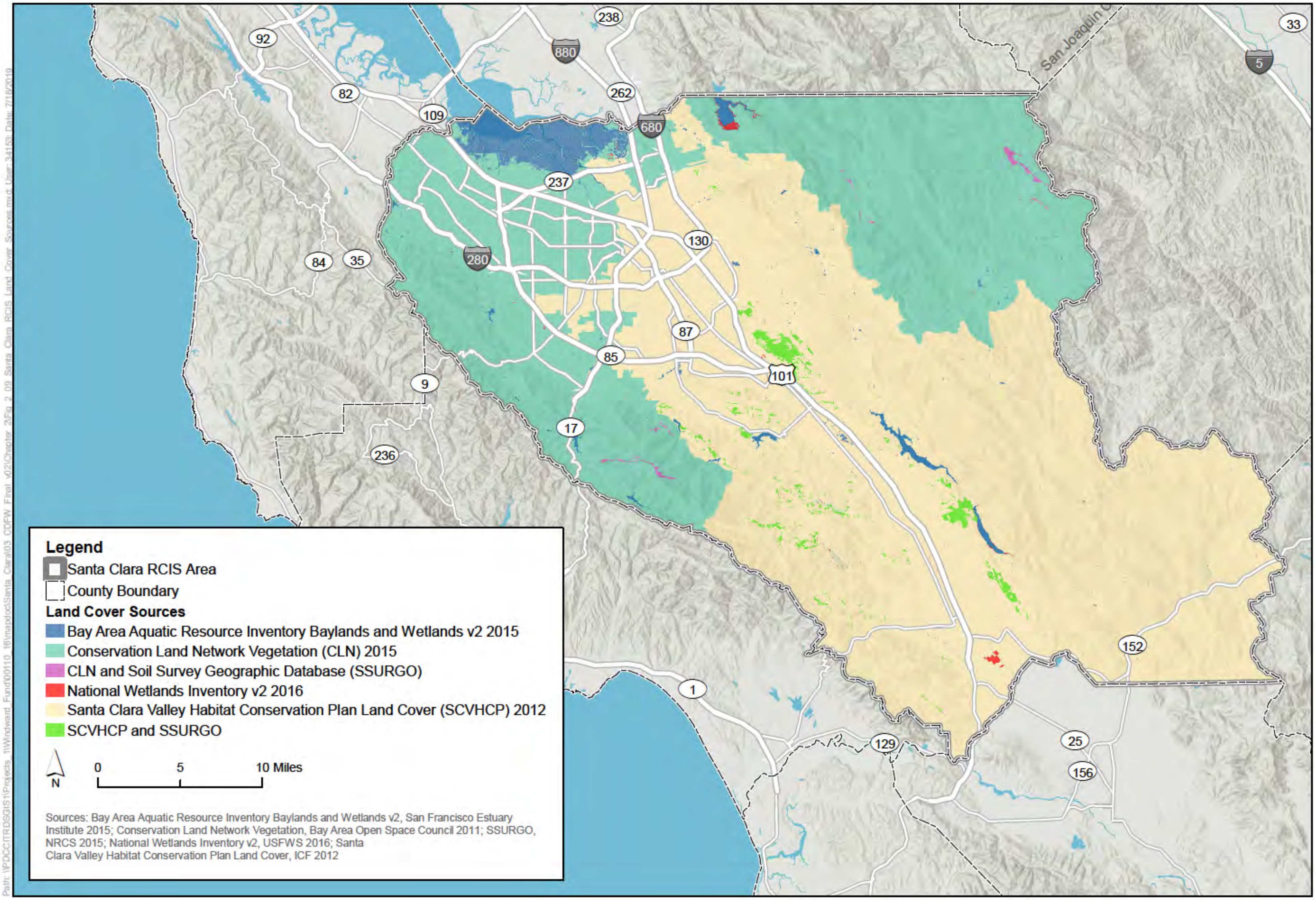

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Figure 2-9
Santa Clara RCIS Land Cover Data Sources

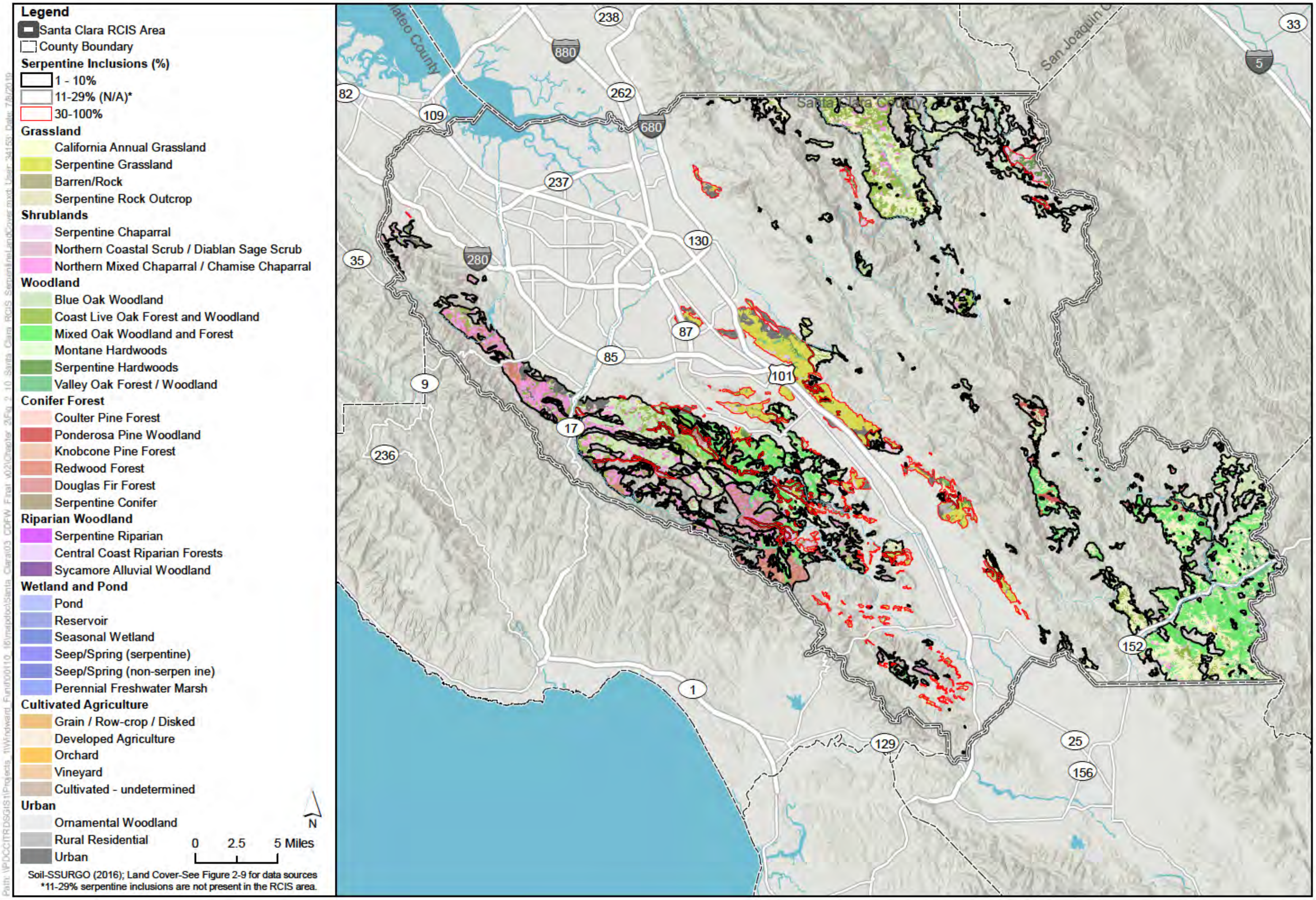

Figure 2-10
Distribution of Serpentine/Ultramafic Soils and Land Cover in the RCIS Area

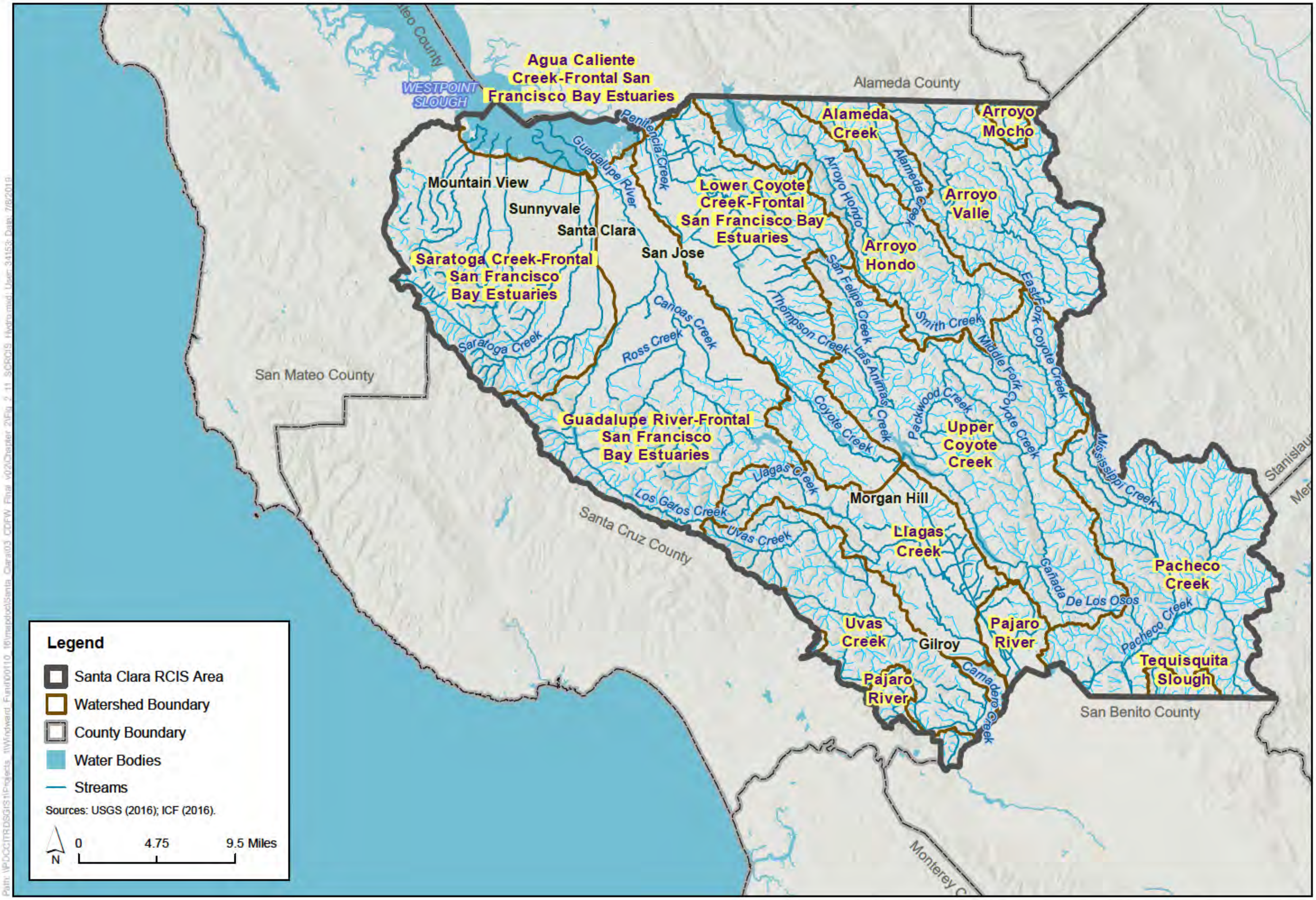

Figure 2-11
Streams and Water Bodies in the RCIS Area

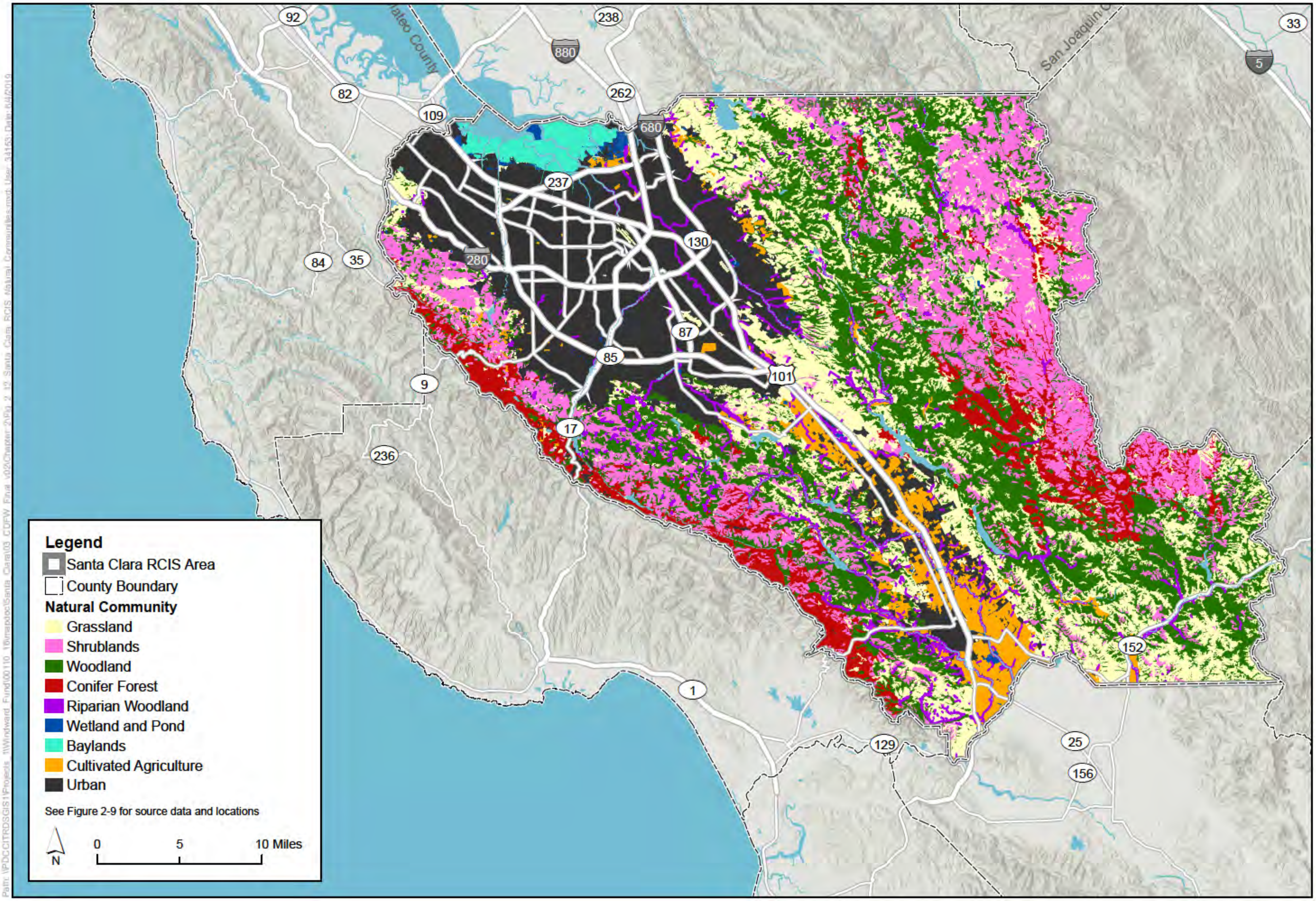

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Figure 2-12
Natural Communities in the RCIS Area

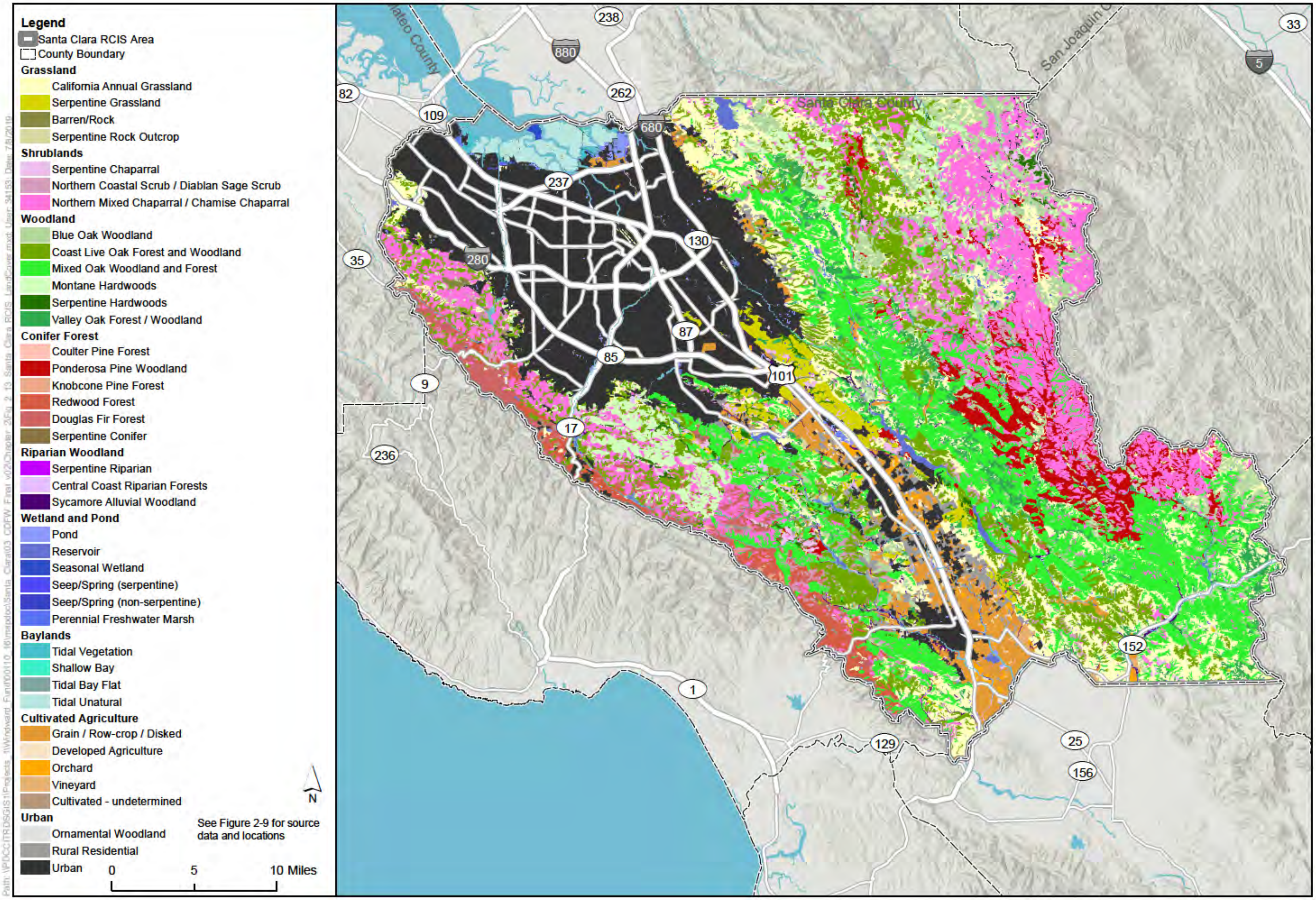

Figure 2-13
Land Cover in the RCIS Area

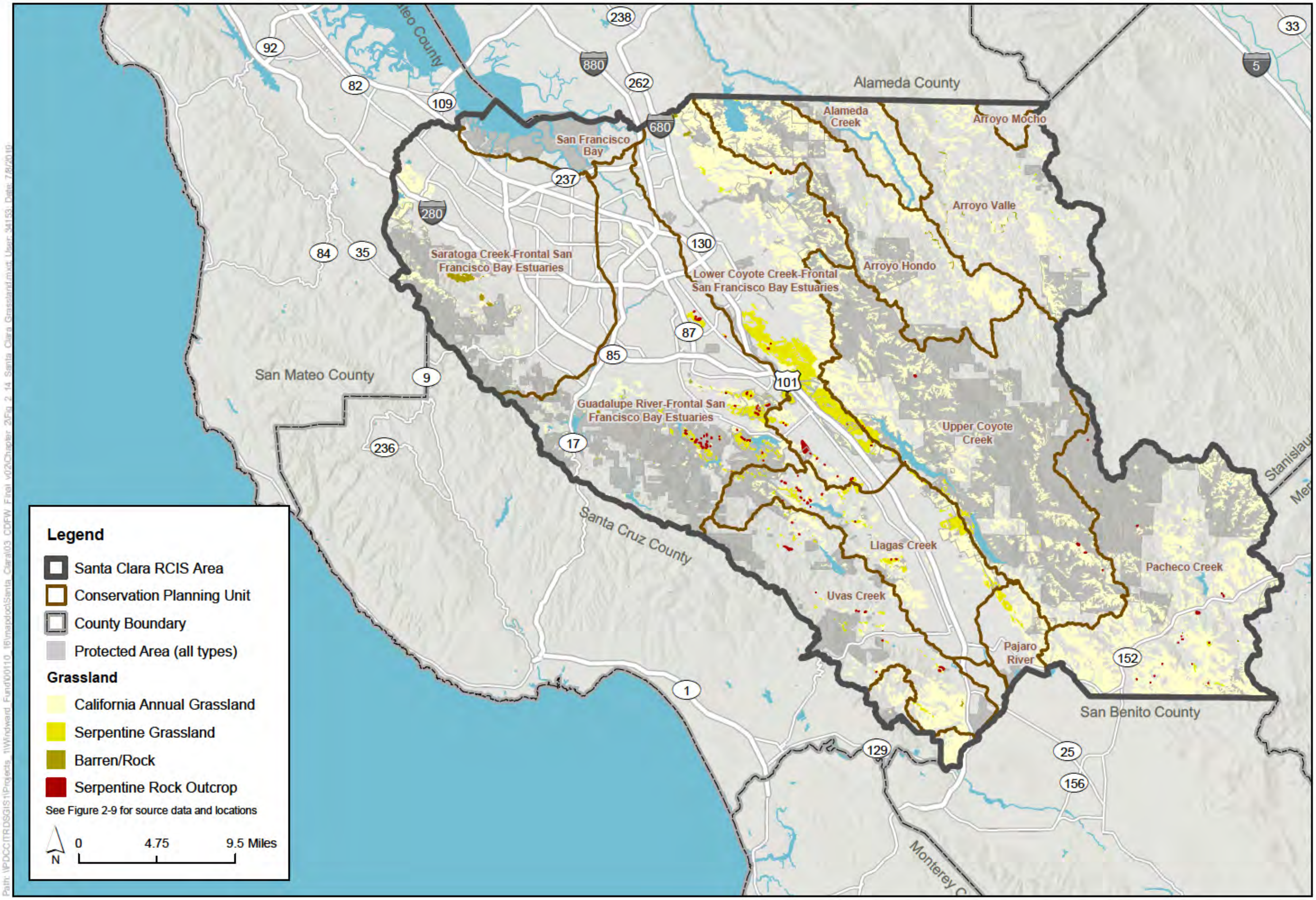

Figure 2-14
Grassland Land Cover in the RCIS Area

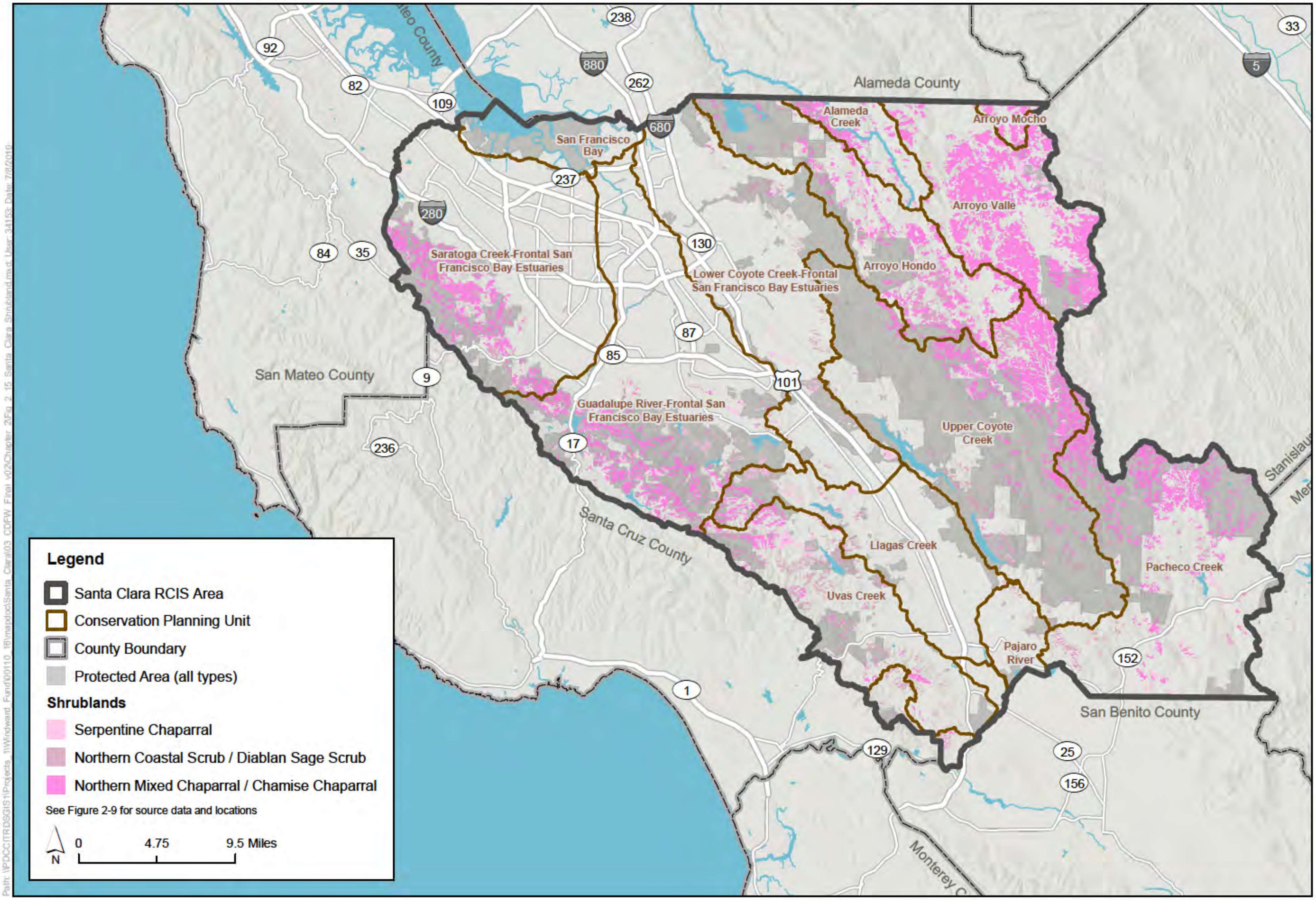

Figure 2-15
Shrubland Land Cover in the RCIS Area

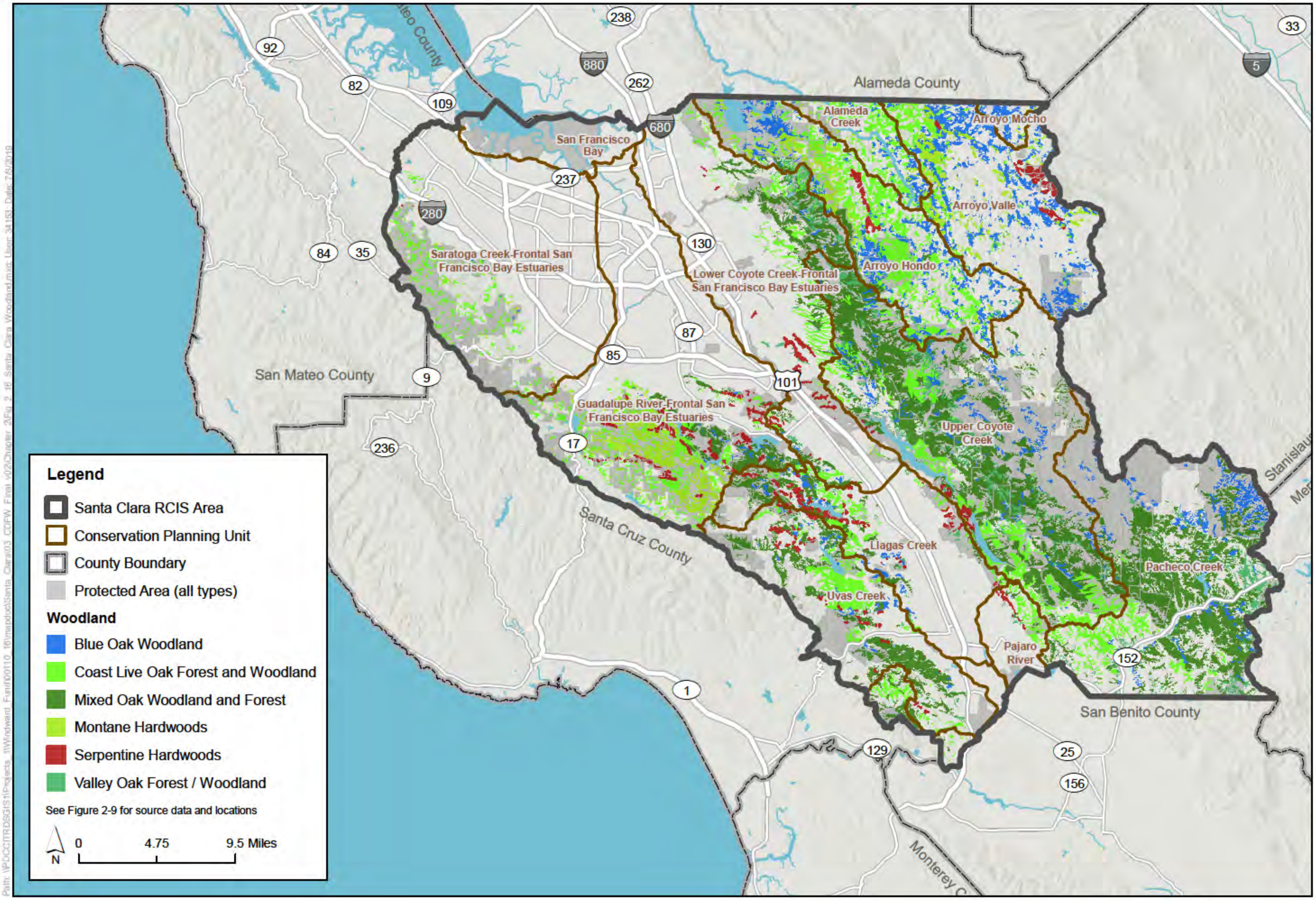

Figure 2-16
Woodland Land Cover in the RCIS Area

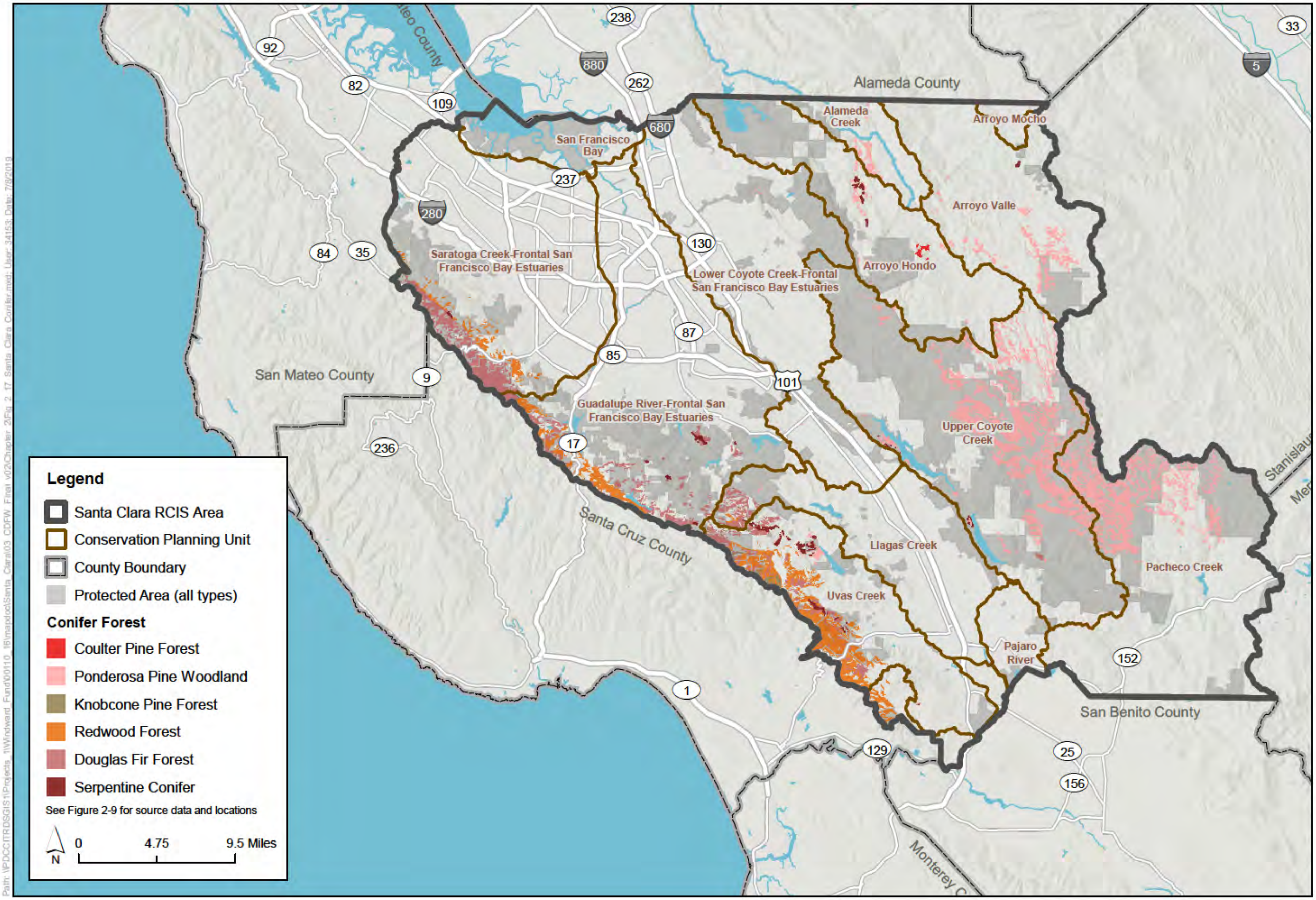

Figure 2-17
Conifer Forest Land Cover in the RCIS Area

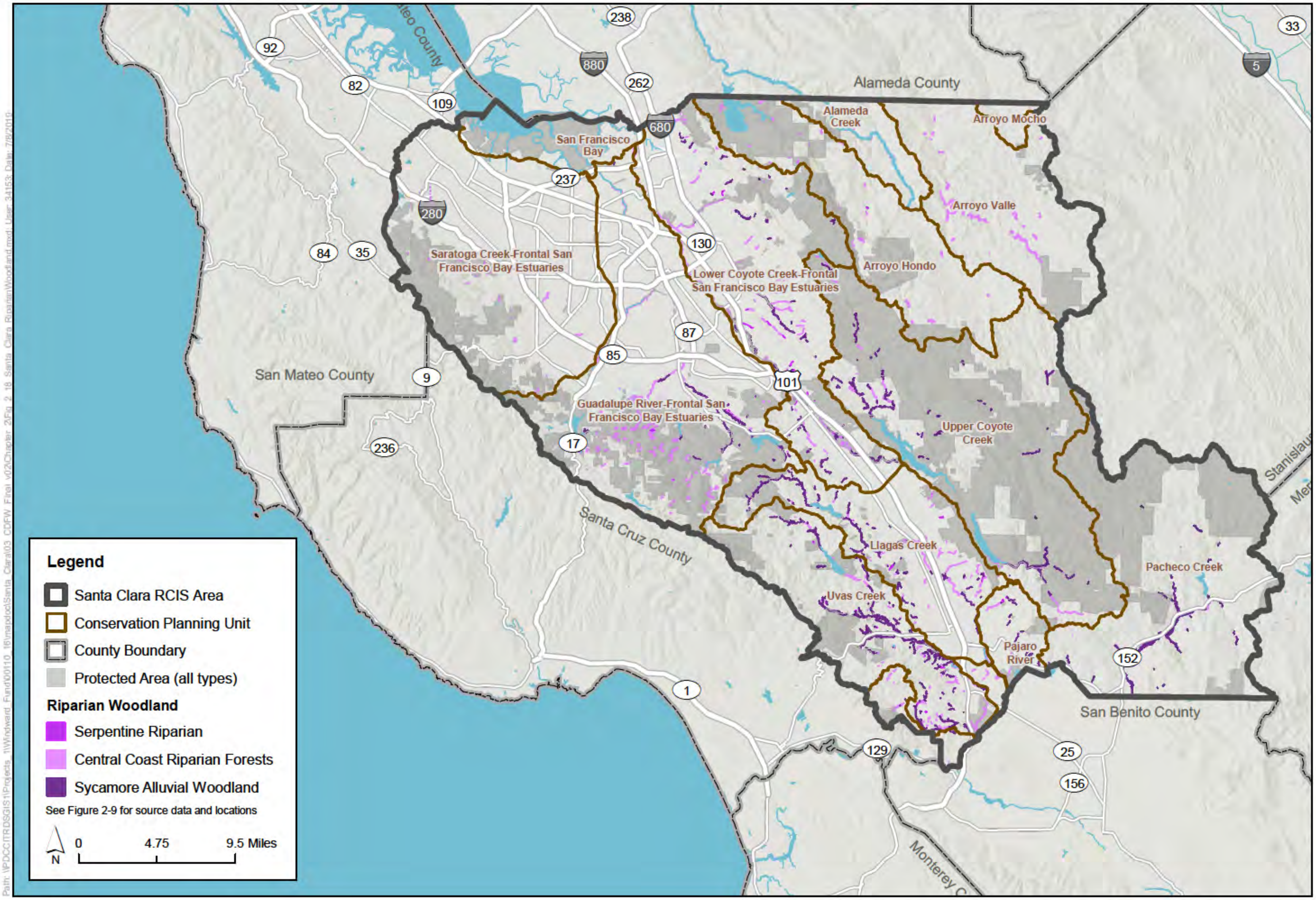

Figure 2-18
Riparian Woodland Land Cover in the RCIS Area

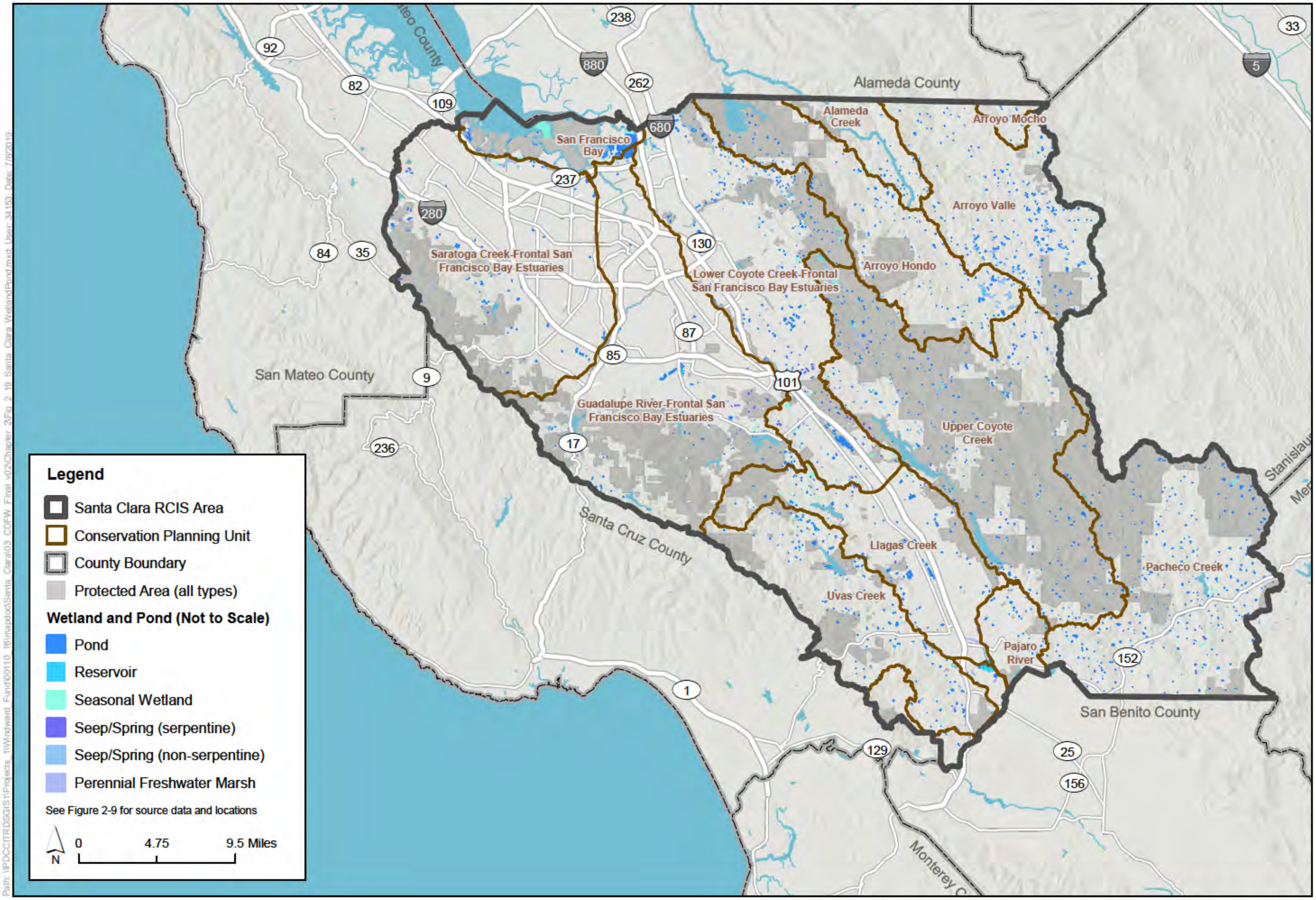

Figure 2-19
Wetland and Pond Land Cover in the RCIS Area

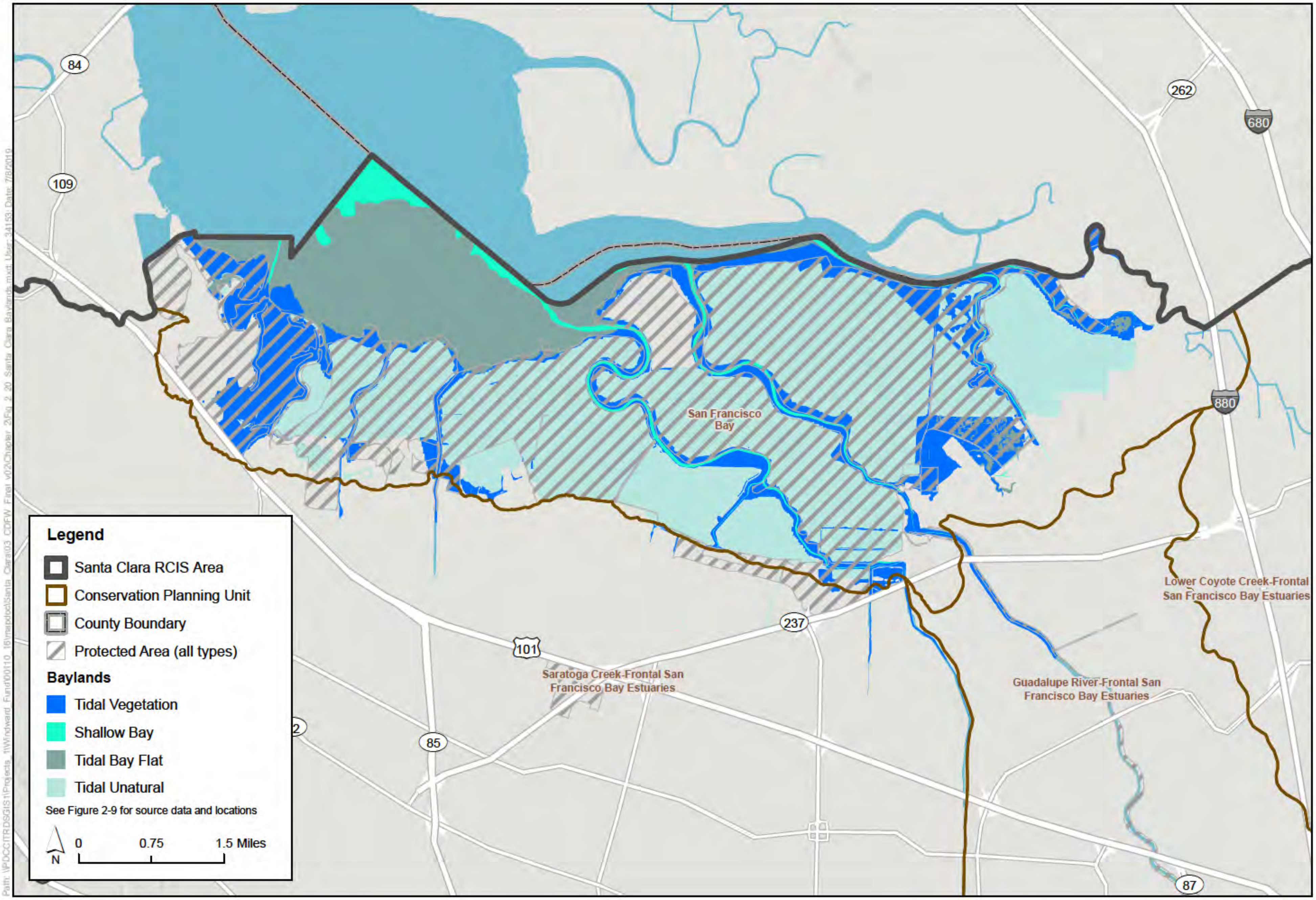

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Figure 2-20
Bayland Land Cover in the RCIS Area

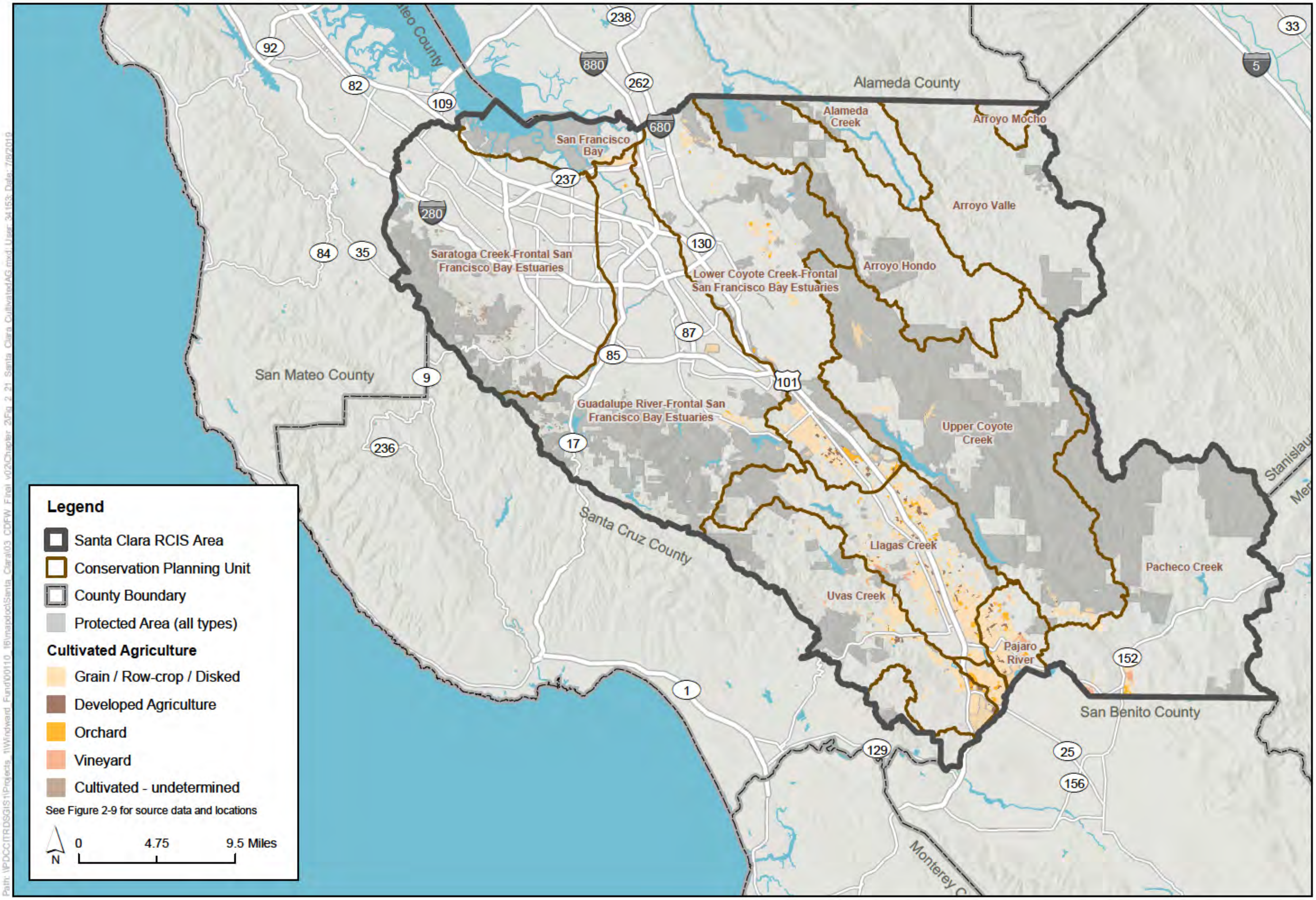

Figure 2-21
Cultivated Agricultural Land Cover in the RCIS Area

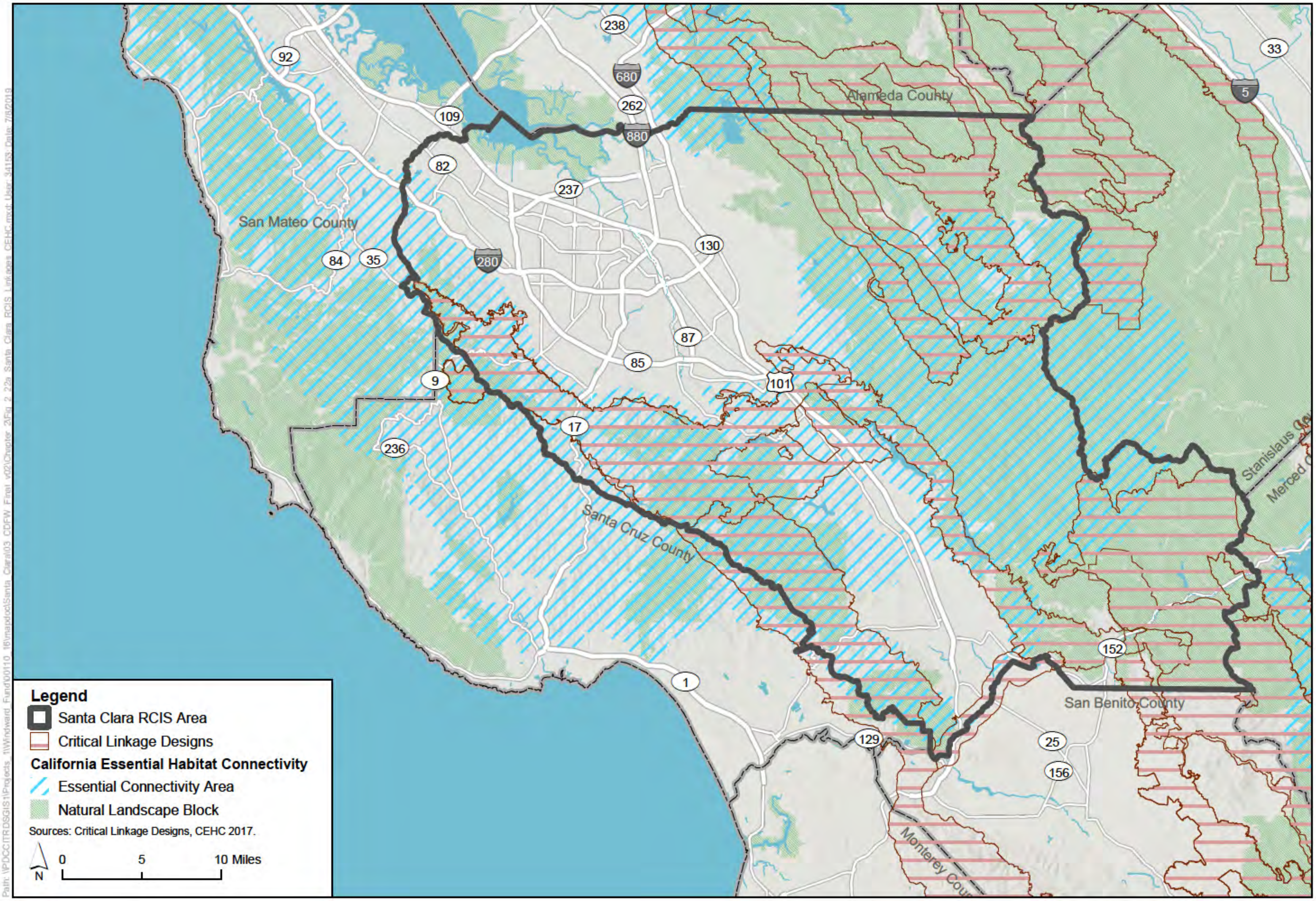

Figure 2-22a
California Essential Habitat Connectivity Linkages in the RCIS Area

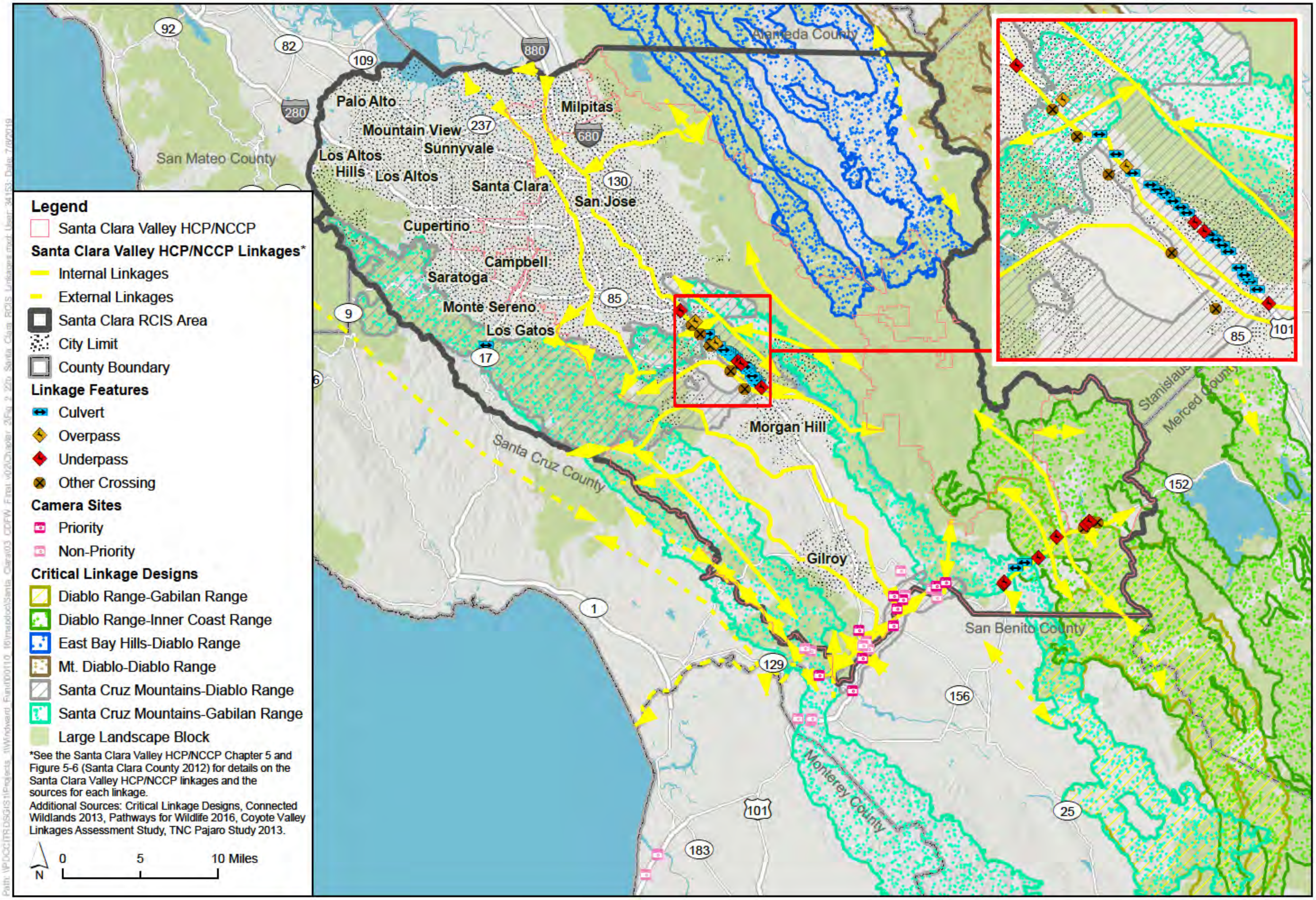

Figure 2-22b
Linkages within the RCIS Area

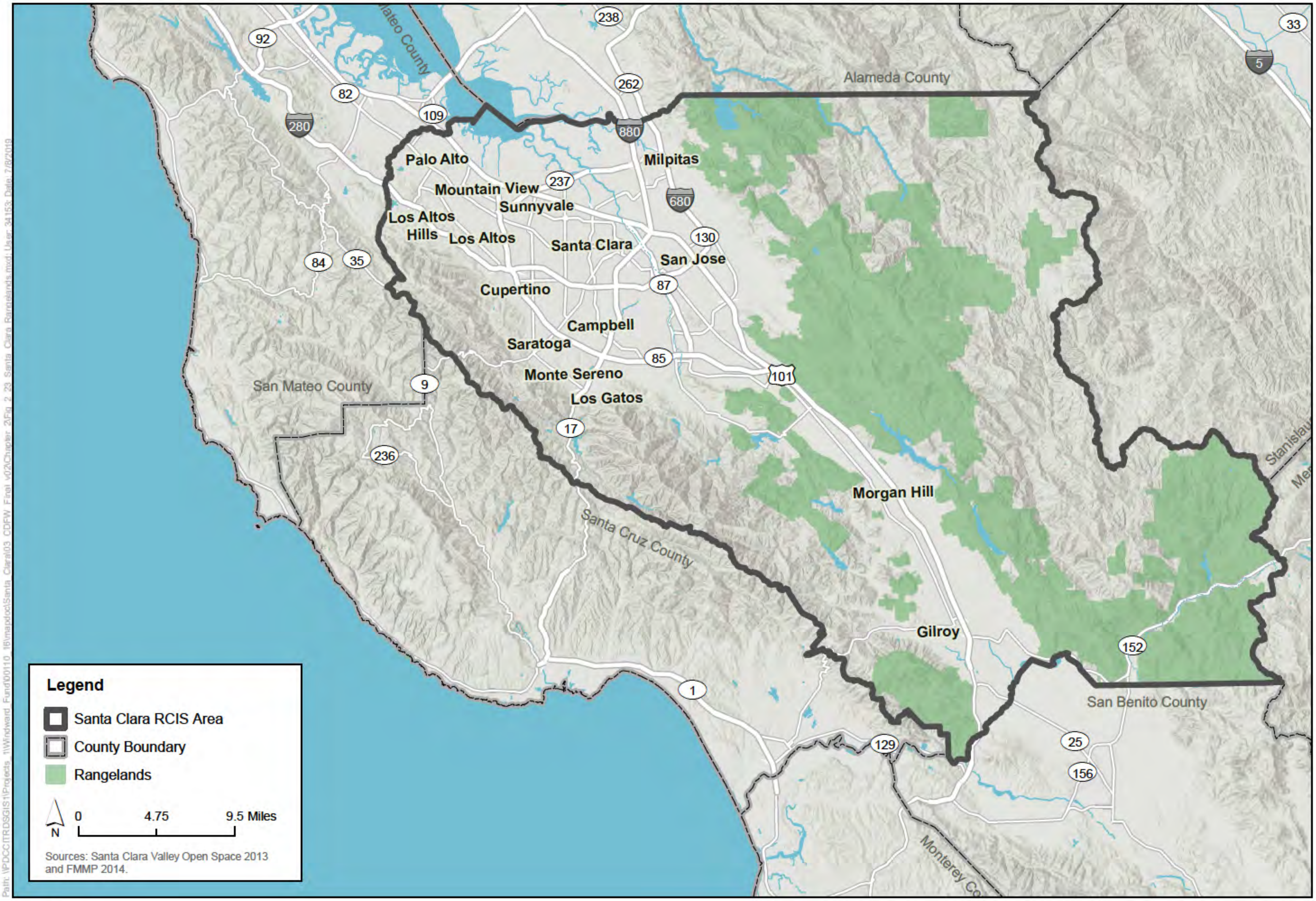

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Figure 2-23
Rangeland in the RCIS Area

Chapter 3
Conservation Strategy

3.1 Overview

The conservation strategy was designed to meet the requirements of CDFW's Program Guidelines (California Department of Fish and Wildlife 2017a). This chapter describes how conservation opportunities have been identified and prioritized in the RCIS area. This Santa Clara County RCIS uses the best available science to identify conservation goals and objectives, conservation actions, habitat enhancement actions, and conservation priorities to aid California's declining and vulnerable species by protecting, restoring, creating, enhancing, and reconnecting habitat. This conservation strategy is intended to guide conservation investments and advance mitigation. Implementation of this strategy will also contribute to sustaining and enhancing populations of these species and large blocks of their habitats, and help species adapt to climate change, as well as other pressures and stressors, such as habitat fragmentation. Robust and effective landscape linkages can serve more than wildlife and will benefit plant dispersal and re-establishment of natural communities over time; landscape linkages are a critical element of long-term ecological resilience in response to climate change.

3.2 Framework

The conservation strategy for this Santa Clara County RCIS comprises four elements: conservation goals, conservation objectives, conservation and habitat enhancement actions, and conservation priorities. These elements are presented in the conservation strategy for each focal species (Section 3.6, *Conservation Strategy for Focal Species*) and the conservation strategy for other conservation elements (Section 3.7, *Conservation Strategy for Other Conservation Elements*). The conservation strategy provides conservation and habitat enhancement actions and priorities to accomplish the conservation goals and objectives through the following general concepts.

- Protect populations of focal and other native species and their habitats to enable these species to persist in the RCIS area and adapt to a changing climate.
- Manage and enhance focal and other native species' habitats to maintain and improve habitat quality for these species.
- Protect and enhance landscape linkages (including passage by aquatic species within streams) to facilitate movement through the landscape by fish, wildlife, and plants (e.g., as seeds are dispersed by wildlife).
- Restore habitats and natural communities that have been degraded or lost over time.
- Retain working landscapes for the benefit of focal and other native species and agricultural uses.
- Protect land cover types that are uncommon in the RCIS area to maintain a representative diversity of natural communities and ecological processes.

This RCIS used a conservation gap analysis (Section 3.3, *Conservation Gap Analysis and Conservation Targets*) to inform the development of quantitative land preservation objectives. The conservation gap analysis was used to determine the amount of land cover types and focal species' habitat currently protected in the RCIS area and that will be protected by the Santa Clara Valley Habitat Plan (Habitat Plan) (ICF International 2012), identify gaps in habitat protection, and set quantitative objectives to protect unprotected habitat.

This chapter also presents a framework for adaptive management and monitoring (Section 3.9, *Adaptive Management and Monitoring Strategy*), which can be used to inform the development of adaptive management and monitoring plans for mitigation credit agreements (MCA) under this Santa Clara County RCIS (see Chapter 4, *Implementation*, Section 4.3, *Mitigation Credit Agreements*).

The conservation strategy is consistent with previously approved plans and policies in the RCIS area, including the Habitat Plan (ICF International 2012) and other Habitat Conservation Plans (HCPs) that overlap the RCIS area (Section 3.5, *Relationship between this RCIS and the Santa Clara Valley Habitat Plan*, and Section 3.8, *Consistency with Approved Conservation Strategies and Recovery Plans*). These plans and policies, identified in Section 1.5, *Relevant Plans and Policies*, were evaluated and utilized as much as possible to create the conservation strategy.

3.2.1 Conservation Goals and Objectives

This Santa Clara County RCIS's conservation goals reflect the broad, desired outcome for the focal species and other conservation elements and address the stressors on focal species and important conservation elements identified in Section 2.4, *Pressures and Stressors on Focal Species and Other Conservation Elements*. Each conservation goal is supported by several objectives. *Objectives* are concise, measurable statements of the target outcome for each focal species and other conservation elements. Quantitative objectives focus on protecting unprotected land (Section 3.3, *Conservation Gap Analysis and Conservation Targets*) and enhancing land that is already protected. In some cases, conservation objectives focus on enhancement of other conservation elements, such as protection of landscape linkages or removal of movement barriers (Section 3.7, *Conservation Strategy for Other Conservation Elements*). Where possible, objectives are quantitative and include a description of how they provide for adaptation opportunities to offset the effects of climate change. Objectives are set such that, if implemented, they would accomplish the conservation goals.

Most of the conservation goals and objectives for focal species are designed to increase the size of their populations. The conservation goals and objectives also provide for the long-term persistence of focal species through protection and enhancement of populations and habitat. In some cases, populations of focal species are expected to increase as a result of land preservation, management, habitat enhancement, and habitat restoration.

All conservation goals and objectives are given unique codes so that they can be easily identified and tracked by those implementing conservation actions and habitat enhancement actions.

3.2.2 Actions and Priorities

This Santa Clara County RCIS's actions and conservation priorities are the strategies that will be employed to accomplish the conservation goals and objectives. Actions include conservation actions and habitat enhancement actions and are defined by CDFW's RCIS Program Guidelines (California Department of Fish and Wildlife 2018a) as follows.

> *Conservation action* is an action identified in an RCIS that, when implemented, would permanently protect or restore, and perpetually manage, conservation elements, including focal species and their

habitats, natural communities, ecological processes, and wildlife corridors. In contrast, a habitat enhancement action would have long-term durability but would not involve acquiring land or permanently protecting habitat – see *habitat enhancement action*. A conservation action is developed to achieve one or more conservation objectives. A conservation action may be implemented through a variety of conservation investments or MCAs. A conservation action that is implemented through an MCA would create conservation credits to be used as compensatory mitigation.

Habitat enhancement action is an action identified in an RCIS that, when implemented, is intended to improve the quality of wildlife habitat, or to address risks or stressors to wildlife. A habitat enhancement action is developed to achieve one or more conservation objectives. A habitat enhancement action would have long-term durability but would not involve acquiring land or permanently protecting habitat. In contrast, a conservation action would permanently protect or restore, and perpetually manage, conservation elements – see Conservation Action. Examples of habitat enhancement actions include improving in-stream flows to benefit fish species, enhancing habitat connectivity, and controlling or eradicating invasive species. A habitat enhancement action may be implemented through a variety of conservation investments or MCAs. A habitat enhancement action that is implemented through an MCA would create habitat enhancement credits intended for use as compensatory mitigation for temporary impacts.[1]

The actions described in the conservation strategies in this chapter are not identified as either conservation actions or habitat enhancement actions to retain flexibility in how the action may be implemented under an MCA, as many of the actions can be implemented on land or water permanently protected under a conservation easement (i.e., conservation action), or on land or water protected under a long-term durability agreement that is not permanently protected (i.e., habitat enhancement action). For example, an action to grow crops that provide high-quality foraging habitat for Swainson's hawk may be implemented on permanently protected land, with the land managed in perpetuity to provide foraging habitat for Swainson's hawk, or on land protected under an appropriate durability agreement that is not permanently protected.

A conservation priority is defined by the Program Guidelines as follows.

Conservation priority is a conservation or habitat enhancement action (e.g., land acquisition, restoration, or habitat enhancement) that is identified based on its importance for benefiting and contributing to the conservation of focal species and their habitats, or other conservation elements within an RCIS area.

Conservation priorities are used to highlight important conservation actions and habitat enhancement actions that should be implemented within the next 10 years. If additional actions or new priorities emerge, the RCIS can be amended to include them, as necessary (Chapter 4, *Implementation*, Section 4.7, *Extending and Amending this RCIS*), or they can be added to the RCIS when extending the approval period (Chapter 4, Section 4.2.1, *Updating this RCIS with Best Available Science*).

This RCIS includes a "toolbox" of actions and conservation priorities that can be implemented to achieve this RCIS's conservation goals and objectives. Because this is a voluntary conservation strategy, and because resources available for the conservation community and others to invest in conservation and habitat actions are limited and variable, it is not expected that all of the actions and priority actions will be implemented over the next 10 years.

[1] CFGC 1856(d) states that "…the habitat enhancement action shall remain in effect at least until the site of the environmental impact is returned to pre-impact ecological conditions."

3.2.2.1 Identifying Conservation Priorities

The conservation priorities in this RCIS emphasize the following types of actions.

- Protection of occurrences or populations of focal species.
- Protection of focal species' habitats, prioritizing habitats that are generally more limited, or limiting to a species' persistence. For example, for California tiger salamander, areas with aquatic breeding habitat interspersed within upland habitat is prioritized over upland habitat that does not support aquatic breeding habitat because the availability of aquatic breeding habitat generally limits persistence in an area. Similarly, primary habitat is prioritized over secondary habitat (as defined for some plant species).
- Protection or enhancement of corridors or linkages for movement, to improve connectivity between habitats (Chapter 2, *Environmental Setting*, Section 2.3.1, *Habitat Connectivity*).
- Management actions to improve habitat conditions (e.g., removal or control of invasive species, vegetation management).
- Surveys of potentially suitable habitat to locate new occurrences or populations for protection, particularly for species with few known occurrences in the RCIS area.
- Protection of unique land cover types (Section 2.3.3, *Unique Land Cover Types*).

If conservation priorities were included from sources outside of this RCIS, the citation is provided next to the priority. In all other cases the following criteria were used to identify priorities unique to this RCIS.

Other information was used to further define the conservation priorities in the RCIS area, including the following. All of these conservation factors are considered in combination when determining the conservation value of a location.

- Documented and recent species occurrences (Section 2.2.5.3, *Focal Species Profiles*).
- Designated critical habitat (for focal species that have designated critical habitat) (Section 2.2.5.3, *Focal Species Profiles*).
- Recovery plans and recovery areas (for focal species which are also federally listed) (Section 2.2.5.3, *Focal Species Profiles*).
- Local knowledge of priority restoration and enhancement actions (Smith J., pers. comm, Calnan A. pers. comm.).
- Locations of rare or unique land cover types (Section 2.3.3, *Unique Land Cover Types*).
- Locations of wildlife linkages (Section 2.3.1, *Habitat Connectivity*).
- Adjacency to protected areas (Section 2.2.1, *Protected Areas*).
- Locations that would or are expected to promote climate resilience (California Department of Fish and Wildlife 2017a, ICF International 2012).

The focal species conservation actions, habitat enhancement actions, and priorities in this RCIS were identified based on their importance for contributing to the conservation and recovery of the focal species and their habitats within the RCIS area. Other natural resource conservation co-benefits not addressed by this RCIS may also be used to inform the implementation of conservation actions, habitat enhancement actions, and priorities. Co-benefits may include, but are not limited to, carbon storage, ground water recharge, and water hazard risk reduction.

Users of this RCIS may wish to identify conservation co-benefits not addressed in this RCIS (e.g., landscape linkages and other conservation elements) to provide additional context to the conservation actions, habitat enhancement actions, and priorities in this RCIS. The *Bay Area Greenprint*[2] (Bay Area Greenprint) (Bay Area Greenprint 2017) and the *Santa Clara Valley Greenprint*[3] (Santa Clara Greenprint) (Santa Clara Valley Open Space Authority 2014) are tools that reveal the multiple benefits of natural and agricultural lands, and can be used to provide additional context to this RCIS's conservation strategies to further inform implementation of conservation actions and habitat enhancement actions. The valuation of these benefits in the *Santa Clara Valley Greenprint* has been incorporated into the prioritization presented in this RCIS. The *Bay Area Greenprint* could be used in parallel or in addition once conservation lands are identified.

3.2.2.2 Transplanting Plants to Create New Populations

Transplantation of plant material (e.g., seeds, cuttings, etc.) is one strategy in the RCIS conservation action and habitat enhancement action toolbox to assist in the conservation and recovery of populations of focal plant species. When it is infeasible to permanently protect enough populations of rare plants to secure long-term viability of a species or subspecies, transplantation may be considered as a means to enhance degraded populations or create new populations to increase a species' likelihood of long-term viability.

This RCIS does not intend for transplantation to be used to compensate for impacts to rare plants, unless a transplanted occurrence has been documented to be well established through long-term monitoring, and with approval by the permitting wildlife agency. Transplantation of rare plants is rarely successful in establishing a new occurrence. Because of the low likelihood of successful transplantation of rare plants at a new location, transplantation is opposed by conservation organizations as a primary mitigation tool (Howald 1996, California Native Plant Society 1998).

Transplantation to assist in the conservation and recovery of populations of focal plant species should only be done after developing a thorough plan in coordination with botanists with expertise on the species or subspecies (or closely related taxa) to be transplanted, and with CDFW and USFWS, particularly if the plant is state or federally listed, or considered rare by the California Native Plant Society.[4]

Careful planning for transplantation should include consideration of the plant's biological and environmental requirements, as transplantation can be extremely stressful. Translocation of rare plants should not be done close to an existing population of that species, as measured by the potential for genetic exchange among individuals through pollen or propagule (e.g., seed, fruit) dispersal, unless transplantation propagules are from a local population (i.e., there is genetic exchange between the propagule source and the existing population that will be enhanced through transplantation). Transplanting or seeding receptor sites (i.e., habitat suitable for establishing a new population) should be carefully selected on the basis of physical, biological, and logistical considerations (Fiedler and Laven 1996, ICF International 2012). It is crucial that the soil and

[2] https://www.bayareagreenprint.org/
[3] https://www.openspaceauthority.org/conservation/conservation-priorities/santa-clara-valley-greenprint.html
[4] https://www.cnps.org/rare-plants/cnps-rare-plant-ranks

habitat requirements of the species must be fully understood before successful establishment can be assured (Fiedler 1991). Both the source location and the receptor site must be carefully prepared, to ensure that plants are removed and planted in a manner that provides them with the best chance of reestablishment. Thus, transplantation should only occur on a case-by-case basis using pilot studies and in consultation with CDFW, the USFWS, and species experts in the RCIS area to ensure that both the species' biological requirements and site-specific conditions are fully understood. There is slightly less risk associated with translocation for those species that are locally abundant in the RCIS area (e.g., smooth lessingia) than species for which there are very few occurrences (e.g., rock sanicle or Tracy's eriastrum) (Clements 2013).

3.2.3 Geographic Units of Conservation

The RCIS area was subdivided into 13 discrete *conservation planning units* (CPUs) where conservation actions and habitat enhancement actions could occur. The geographic units of conservation, which are based on the watershed boundaries in the RCIS area, provide a biologically meaningful way to identify the locations where conservation actions and habitat enhancement actions may be implemented without identifying specific parcels. This approach focuses the conservation actions and habitat enhancement actions in a spatially explicit manner into general priority areas where actions can help meet the conservation goals and objectives, while maintaining the flexibility to implement many of these actions on different sites or parcels in order to meet the same conservation goals and objectives.

The CPUs were developed using hydrologic unit code (HUC)-10 watershed boundaries (Section 2.2.3, *Watersheds*). Watershed boundaries were selected because these boundaries are also used by the Habitat Plan (ICF International 2012) to organize its conservation strategy[5] and because wetland and other aquatic mitigation is often defined in terms of location within watersheds. Many watersheds at the HUC-10 level occur entirely within the RCIS area (Figure 2-8); however, only a small portion of the Agua Caliente Creek watershed is in the RCIS area. , This watershed was merged with the neighboring San Francisco Bay watershed so that all CPUs were similarly and reasonably sized. The 13 CPUs are named after the majority watershed in that part of the RCIS area: San Francisco Bay, Alameda Creek, Arroyo Mocho, Arroyo Valle, Arroyo Hondo, Lower Coyote Creek, Saratoga Creek, Guadalupe River, Upper Coyote Creek, Llagas Creek, Pacheco Creek, Uvas Creek, and Pajaro River. The CPUs are displayed on the focal species habitat model figures in Appendix H, *Focal Species Habitat Models*.

3.3 Conservation Gap Analysis and Conservation Targets

A key step in the development of the conservation strategy for this Santa Clara County RCIS was to estimate the amount of habitat needed to create a large interconnected network of protected areas that would contribute to the recovery of populations of focal species and native biodiversity. The gap analysis is modeled after the Conservation Lands Network (CLN), an established land protection assessment for the 9-county San Francisco Bay Area and overlapping the RCIS area (Bay Area Open Space Council 2011), to be consistent with San Francisco Bay Area conservation planning efforts.

[5] In the Santa Clara Valley Habitat Plan the conservation units are called "conservation analysis zones."

The conservation gap analysis was conducted at two levels: the land cover level and the focal species level. The results of the land cover gap analysis were used to quantify focal species conservation targets for the preservation of focal species' habitat, as the land cover types are the basic elements used to construct the focal species habitat models (Section 2.2.5.2, *Habitat Distribution Models*). Conservation goals and objectives were not developed for land cover types, with a few exceptions for serpentine (Section 3.7.3, *Serpentine Soils*) and unique land cover types (Section 3.7.4, *Unique Land Cover Types*).

3.3.1 Data Sources

To determine the gaps in protection for the land cover and focal species in the RCIS area, the following geographic information system (GIS) data layers were used.

- Land cover (Section 2.2.4, *Natural Communities and Land Cover*, and Figures 2-14 through 2-21).
- Species habitat distribution models (Section 2.2.5, *Focal Species*, and Appendix H, *Focal Species Habitat Models*).
- Protected land (Section 2.2.1, *Protected Areas*, and Figure 2-5) from California Protected Areas Database 2016 and GIS data from the Santa Clara Valley Open Space Authority and the Midpeninsula Regional Open Space District (Table 1-4, *Recovery and Other Conservation Plans*) for recently protected areas not yet included in the California Protected Areas Database or California Conservation Easement Database.

3.3.2 Land Cover Gap Analysis

As described in Section 2.2.5.2, *Habitat Distribution Models*, land cover types are the basic unit of evaluation for habitat modeling and development of conservation strategies for focal species. Therefore, the first step in setting quantitative habitat protection objectives for the focal species was to determine how much to protect for each land cover type that comprises each focal species habitat model. These land cover conservation targets were used to calculate conservation targets for focal species, which are expressed as habitat preservation objectives for the focal species (Section 3.6, *Conservation Strategy for Focal Species*).

Conservation targets for land cover types were used to set land preservation objectives for serpentine and other land cover types that are uncommon in the RCIS area (Sections 3.7.3, *Serpentine Soils*, and 3.7.4, *Unique Land Cover Types*); this RCIS does not include land cover preservation objectives for the other land cover types because it is expected that protection for focal species that rely on these land cover types (e.g., California tiger salamander use of California annual grassland) will result in protection of these land cover types.

Conservation targets were identified for each land cover type, generally consistent with the approach used by the CLN for setting protection goals (Bay Area Open Space Council 2011). The CLN created a collaborative, science-based vision to conserve the San Francisco Bay Area's landscapes and biodiversity and provides a good model for conservation planning and goal setting in the RCIS area. The conservation targets identify a percentage of the total amount of each land cover type that should be protected in the RCIS area. Each land cover type was assigned one of three levels of protection: 50%, 75%, or 90%. These levels were based on the rarity of the land cover type in the

RCIS area, with more common land cover types receiving a lower protection goal than less common land cover types.[6]

As with the CLN, the percentage protection targets are high compared with other conservation planning efforts (generally ranging from 30-40 percent [Groves 2003, as cited in Bay Area Open Space Council 2011]). One reason the CLN used high goals is because the minimum amount of protected habitat needed for all species within a region to persist varies greatly between regions, and depends on the life history of the species comprising the region, their habitat requirements, and the extent of pressures and stressors in the region (Fahrig 2001, as cited in Bay Area Open Space Council 2011). See Chapter 3, *Approach and Methodology* in the *Conservation Lands Network: San Francisco Bay Area Upland Habitat Goals Project Report* (Bay Area Open Space Council 2011) for details on the rationale for using high protection goals in the CLN. The Santa Clara County RCIS Steering Committee concurred with the CLN's rationale for its protection goals and so elected to apply similar protection percentages in this RCIS.

The following steps were used to determine the conservation gap for each land cover type.

1. Calculate in GIS the total area of each land cover type in the RCIS area. This is the amount in the *Total Land Cover* column in Table 3-1. Amounts of land cover, conservation targets, protected land, and the conservation gap in Table 3-1 are rounded to emphasize that the conservation targets and gaps are estimates of the amount of habitat needed to create a large interconnected network of protected areas that would contribute to the recovery of populations of focal species and native biodiversity. As a result, values for conservation targets do not exactly equal the percent conservation target of the total land cover amount. Similarly, the conservation gap may not equal the conservation target minus the amount currently protected and the amount that will be protected by the habitat plan.
2. Identify RCIS area-wide conservation targets for each land cover type based on its rarity, consistent with the approach used by the Conservation Lands Network (Bay Area Open Space Council 2011): 90% for unique land cover types, 75% for important native land cover types, and 50% for common or non-native land cover types that support focal species. CLN conservation targets were generally applied to corresponding RCIS land cover types. Some man-made land cover types were not given a conservation target (i.e., urban land cover types, some agriculture land cover types, and reservoir). The *Conservation Target (Percent of Total in RCIS Area)* column in Table 3-1 identifies the conservation target as a percent of the total amount for each land cover type in the RCIS area.
3. Multiply the total area of each land cover type by its conservation target percentage to determine the amount of land to meet the conservation target. These amounts are identified in the *Conservation Target* column in Table 3-1.
4. Calculate in GIS the area of each land cover type protected by conservation easement or in fee title (or both) by a public agency or conservation organization. These amounts are identified in the *Currently Protected* column in Table 3-1.[7]

[6] Because California annual grassland provides habitat for many of this RCIS's focal species, the conservation target for this land cover type was set at 75% of total land cover, despite being a common land cover type in the RCIS area.

[7] Many lands are owned by public agencies or private entities for conservation or recreation purposes but are not necessarily protected by a conservation easement.

5. Identify the amount of each land cover type that will be protected by the Habitat Plan (ICF International 2012) using the acres in the *Required Protection if All Impacts Occur* column in Table 5-13 of the Habitat Plan. The Habitat Plan land cover protection requirements were added to the RCIS gap analysis consistent with the crosswalk of land cover types in Table 2-3a and Table 2-3b.
6. Subtract from the conservation target the amount currently protected and the amount that will be protected by the Habitat Plan to determine the amount of additional unprotected land that needs to be protected to meet the conservation target for each land cover type. These amounts are identified in the *Conservation Gap* column in Table 3-1.

The conservation targets and gaps provided in Table 3-1 provide guidance on the level of protection sought over the long term. Conservation and mitigation investments made at the focal species level will inherently contribute to achieving the conservation targets for each land cover type.

As with CLN, the habitat protection conservation targets can be achieved by protecting land through fee title and conservation and agriculture easements. Much of the land in the RCIS area is used for agricultural purposes, including cultivated agriculture (Figure 2-21) and rangeland (Figure 2-23). These lands support local economies, provide food for people, support important ecosystem services, and provide habitat values for focal and other native species; it is essential that these land uses are preserved. The sale of conservation and agricultural easements by private landowners can ensure that these land uses are protected, while providing habitat for native biodiversity (Bay Area Open Space Council 2011).

Table 3-1. Conservation Targets and Conservation Gaps in Acres for Each Land Cover Type in the RCIS Area

Land Cover Type	Total Land Cover	Conservation Target (Percent of Total in RCIS Area)	Conservation Target[a]	Currently Protected	Habitat Plan Protection	Conservation Gap
Grassland						
California annual grassland	115,500	75%	86,600	35,700	13,300	37,600[b]
Serpentine grassland[c]	14,300	90%	12,900	5,800	4,000	3,100
Serpentine rock outcrop[c]	270	90%	200	100	120	0
Barren/Rock	1,200	50%	600	90	10	500
Shrublands						
Northern mixed chaparral/chamise chaparral	99,200	75%	74,400	34,800	400	39,200
Serpentine chaparral[c]	5,900	90%	5,300	2,200	700	2,400
Northern coastal scrub/Diablan sage scrub[c]	15,000	90%	13,500	5,100	1,400	7,000
Woodland						
Blue oak woodland	37,800	75%	28,400	13,500	1,100	13,800
Valley oak forest/woodland[c]	15,500	90%	14,000	7,300	1,700	5,000
Coast live oak forest and woodland	65,800	75%	49,400	22,000	2,900	24,500
Mixed oak woodland and forest	98,200	75%	73,700	50,600	7,100	16,000
Montane hardwood[c]	19,900	90%	17,900	9,600	--	8,300
Serpentine hardwood[c]	3,700	90%	3,300	1,500	--	1,800
Conifer Forest						
Redwood forest[c]	15,000	75%	11,300	5,500	10	5,800
Douglas fir forest[c]	15,600	90%	14,000	8,500	20	5,500
Serpentine conifer[c]	750	90%	700	200	--	500
Coulter pine forest[c]	200	90%	200	0	--	200
Knobcone pine forest[c]	710	90%	600	200	N/A	400

Land Cover Type	Total Land Cover	Conservation Target (Percent of Total in RCIS Area)	Conservation Target[a]	Currently Protected	Habitat Plan Protection	Conservation Gap
Ponderosa pine woodland	37,600	75%	28,200	27,000	80[d]	1,100
Riparian Woodland						
Central coast riparian forest[c]	3,700	90%	3,300	1,300	578[e]	1,400
Sycamore alluvial woodland[c]	4,100	90%	3,700	1,000	40	2,700
Serpentine riparian[c]	120	90%	100	20	--	80
Baylands						
Shallow bay	600	50%	300	80	--	200
Tidal bay flat[c]	2,500	90%	2,300	200	--	2,100
Tidal unnatural	8,100	90%	7,300	6,200	--	1,100
Tidal vegetation[c]	2,800	90%	2,500	1,700	--	800
Wetland and Pond						
Perennial freshwater marsh[c]	1,100	90%	1,000	600	50	400
Seasonal wetland[c]	600	90%	500	400	30	70
Seep/Spring (non-serpentine)[c]	100	90%	90	40	--	50
Seep/Spring (serpentine)[c]	40	90%	40	10	10	20
Pond[c]	2,800	90%	2,500	600	104	1,800
Reservoir	5,400	0%	0	4,600	N/A	0
Cultivated Agriculture						
Cultivated-undetermined	1,600	50%	800	200	--	600
Developed agriculture	1,900	0%	0	30	N/A	0
Grain, row-crops, disked	33,300	50%	16,700	3,800	N/A	12,900
Orchard	2,700	0%	0	80	N/A	0
Vineyard	1,400	0%	0	100	N/A	0

Land Cover Type	Total Land Cover	Conservation Target (Percent of Total in RCIS Area)	Conservation Target[a]	Currently Protected	Habitat Plan Protection	Conservation Gap
Urban						
Urban	186,700	0%	0	3,400	N/A	0
Rural residential	12,400	0%	0	200	N/A	0
Ornamental woodland	200	0%	0	70	N/A	0

Notes:

RCIS = Regional Conservation Investment Strategy.

[a] The land cover conservation targets were used to set land preservation objectives for unique land cover types only (Section 2.3.3, *Unique Land Cover Types*).

[b] Example calculation: 115,500 *.75=86,600 and 86,600-35,700-13,000=37,900 (with rounding).

[c] Unique land cover type.

[d] The Habitat Plan has a protection requirement of 80 acres for foothill pine-oak woodland, but no protection requirement for ponderosa pine woodland. This protection requirement is included in the ponderosa pine woodland row in this table, as the Habitat Plan's foothill pine–oak woodland land cover type is included in this RCIS's ponderosa pine woodland land cover type.

[e] Includes Habitat Plan protection commitment for willow riparian forest and scrub and mixed riparian forest and woodland.

-- The Habitat Plan does not include this land cover type.

N/A The Habitat Plan does not have protection requirements for this land cover type.

Except for amounts in the Habitat Plan Protection column, values over 100 are round to the nearest 100. Values between 100 and 10 are rounded to the nearest 10. Values below 10 are not rounded. Differences between conservation targets and currently protected (i.e., the conservation gap) are due to rounding errors.

3.3.3 Focal Species Gap Analysis

The focal species gap analysis uses the results of the land cover gap analysis to calculate the amount of focal species' habitat in the RCIS area that is already protected and the amount that remains unprotected (the "gaps" in protection for each species). The focal species gap analysis is based on the habitat distribution models for each of the focal species, described in Section 2.2.5.2, *Habitat Distribution Models*, and illustrated in Appendix H, *Focal Species Habitat Models*. When habitat was not modeled for a focal species (i.e., some plant species) the conservation strategy was based on occurrence data rather than the protection of a certain amount of modeled habitat. It is assumed that if the conservation targets are accomplished for each land cover type, in addition to the other conservation objectives, actions, and priorities that focus on the protection and management of known populations identified in the focal species conservation strategy (Section 3.6, *Conservation Strategy for Focal Species*), the species that depend on these land cover types and the resources found within it will be protected.

The following steps were used to determine the conservation gaps for focal species.

1. Calculate in GIS the acres of each land cover type that comprise each focal species' habitat model.
2. Calculate the total amount of modeled habitat in the RCIS area for each focal species with modeled habitat. These amounts are provided in the *Total Modeled Habitat* column in Table 3-2. Except for steelhead, amounts of modeled habitat, protected habitat, conservation target, and the conservation gap in Table 3-2 are rounded to emphasize that the conservation targets and gaps are estimates of the amount of habitat needed to create a large interconnected network of protected areas that would contribute to the recovery of populations of focal species and native biodiversity. As a result, the conservation gap may not equal the conservation target minus the amount currently protected and the amount that will be protected by the habitat plan.
3. Determine the conservation target for each land cover type that comprises modeled habitat for each focal species. This was done by multiplying the conservation target (percent) for each land cover type, as used in the land cover gap analysis (Section 3.3.2, *Land Cover Gap Analysis*), by the amount of each land cover type that comprises each focal species habitat model. The sum of these amounts for each focal species and habitat types are provided in the *Conservation Target* column in Table 3-2.
4. Determine how many acres (or stream miles, for steelhead) are protected, by land cover type, within the modeled habitat for each focal species. The sum of these amounts is provided in the *Currently Protected* column in Table 3-2.
5. Determine the amount of modeled habitat that will be protected for species covered by the Habitat Plan, according to the *Commitment to Acquire Modeled Habitat for Reserve System* column in Table 5-17 of the Habitat Plan (ICF International 2012). Because the modeled habitat categories for the species do not align precisely between the two plans, the modeled habitat types from the Habitat Plan and RCIS were crosswalked according to Table 3-3. These amounts are provided in the *Habitat Plan Protection* column in Table 3-2.
6. Subtract from the conservation target the amount that is currently protected and the amount that the Habitat Plan will protect to determine the amount of additional habitat that needs to be protected to meet the conservation target for each focal species. These amounts are provided in the *Conservation Gap* column in Table 3-2.

The results of the conservation gap analysis lay the groundwork for the habitat preservation objectives for focal species. Understanding the quantity and location of available habitat and resources in the RCIS area will inform the conservation priorities.

Table 3-2. Focal Species Conservation Gap Analysis (acres unless otherwise noted)

Modeled Habitat for Focal Species[a]	Total Modeled Habitat	Conservation Target	Currently Protected	Habitat Plan Protection	Conservation Gap
Central California Coast steelhead[b]	31 miles	28 miles	15 miles	N/A	12 miles
South-Central California Coast steelhead[b]	54 miles	48 miles	11 miles	N/A	43 miles
California tiger salamander	605,000	461,100	233,300	30,150	197,700
Breeding habitat	2,200	2,000	600	150	1,300
Occupied breeding	900	800	400	--	400
Upland habitat	470,000	360,800	166,900	30,000	163,900
Occupied upland	132,100	97,500	65,400	--	32,100
Foothill yellow-legged frog	37,000	29,500	15,600	80	14,000
Breeding and foraging	31,000	24,600	12,400	30	12,200
Low-use habitat	6,300	4,900	3,100	50	1,800
California red-legged frog	613,000	466,100	237,000	31,300	198,100
Breeding habitat	4,900	2,800	1,800	1,300	0
Dispersal habitat	584,700	445,000	226,300	30,000	188,700
Refugia habitat	23,400	18,300	8,900	--	9,400
Tricolored blackbird	177,300	126,100	48,400	19,000	58,700
Nesting habitat	8,500	7,700	2,300	1,000	4,400
Foraging and wintering habitat	168,700	118,400	46,100	18,000	54,300
Burrowing owl	144,700	98,400	37,100	22,300	39,000
Occupied Nesting (2017) SCVHA	6,000	1,400	1,000	--[c]	400
Potential Nesting/Overwintering habitat	70,400	46,200	13,800	5,300	27,100
Overwintering (Only) habitat	68,300	50,800	22,300	17,000	11,500
Swainson's hawk	29,500	16,600	3,700	N/A	13,000
Foraging habitat	27,800	15,100	3,100	N/A	12,000
Nesting habitat	1,700	1,500	500	N/A	1,000
San Joaquin kit fox	43,800	33,100	8,600	4,100	20,400
Movement and foraging	42,900	32,700	8,600	4,000	20,100
Low-use habitat	900	400	0	100	300
Congdon's spikeweed	4,900	1,100	700	N/A	400

Modeled Habitat for Focal Species[a]	Total Modeled Habitat	Conservation Target	Currently Protected	Habitat Plan Protection	Conservation Gap
Mount Hamilton thistle	600	500	200	150	150
Occupied habitat	500	400	200	150	50
Suitable habitat	100	100	0	--	100
Fragrant fritillary	134,500	104,000	51,800	23,000	29,200
Primary habitat	12,700	11,500	5,300	3,000	3,200
Secondary habitat	121,700	92,500	46,500	20,000	26,000
Loma Prieta hoita	52,000	40,000	20,000	10,000	10,000
Primary habitat	38,600	29,300	13,900	9,000	6,400
Secondary habitat	13,400	10,700	6,100	1,000	3,600
Smooth lessingia	14,500	13,000	5,800	4,000	3,200
Most beautiful jewelflower	21,600	19,000	8,100	4,000	7,000
Primary habitat	20,400	18,400	8,000	4,000	6,400
Secondary habitat	1,200	600	100	--	600

Notes:

[a] Habitat models were not created for mountain lion, Tracy's eriastrum, or rock sanicle.

[b] The steelhead model was not based on land cover types. For steelhead, a conservation target of 90% was used because of the conservation status of these species.

[c] The Santa Clara Valley Habitat Plan has a goal to acquire 5,300 acres of modeled occupied and potential nesting habitat. For the purposes of the RCIS, this protected habitat is captured under potential nesting/overwintering habitat.

-- Table 5-17 of the Habitat Plan does not have a protection goal for this species or habitat type.

N/A This species is not covered by the Habitat Plan.

Except for amounts in the Habitat Plan Protection column, values over 100 are round to the nearest 100. Values between 100 and 10 are rounded to the nearest 10. Values below 10 are not rounded. Differences between conservation targets and currently protected (i.e., the conservation gap) are due to rounding errors. Stream miles for the steelhead are not rounded.

Table 3-3. Crosswalk between Modeled Habitat for this RCIS's Focal Species and Modeled Habitat for Species Covered by the Habitat Plan

RCIS Modeled Habitat Type	Habitat Plan Modeled Habitat Type
California tiger salamander	
Breeding habitat	Breeding habitat
Upland habitat	Upland habitat
Foothill yellow-legged frog	
Breeding/foraging	Primary habitat
Low-use habitat	Secondary habitat
California red-legged frog	
Breeding habitat	Primary habitat
Refugia habitat	Secondary habitat
Dispersal habitat	Secondary habitat
Tricolored blackbird	
Nesting habitat	Primary habitat
Foraging and wintering habitat	Secondary habitat
Burrowing owl	
Occupied nesting habitat	Occupied nesting habitat
Potential nesting/overwintering habitat	Potential nesting habitat
Overwintering only habitat	Overwintering only habitat
San Joaquin kit fox	
Movement/foraging	Secondary habitat (movement and foraging)
Low-use habitat	Secondary habitat (low-use)
Mount Hamilton thistle	
Occupied habitat	Primary habitat
Potential habitat	N/A
Fragrant fritillary	
Primary habitat	Primary habitat
Secondary habitat	Secondary habitat
Loma Prieta hoita	
Primary habitat	Primary habitat
Secondary habitat	Secondary habitat
Smooth lessingia	
Suitable habitat	Suitable habitat
Most beautiful jewelflower	
Primary habitat	Primary habitat
Secondary habitat	Secondary habitat

Many of the focal species in Table 3-2 have less than 50% of their modeled habitat on protected land and occur on unique land cover types that have high (90%) conservation targets (Table 3-1). Coupled with the low level of protection of many unique land cover types in the RCIS area, the focal species need significant habitat conservation to meet the conservation targets. Because habitat loss or conversion is the main threat to all of the focal species, habitat protection and enhancement are the primary focus of the conservation goals in this Santa Clara County RCIS.

3.4 Adaptations against the Effects of Climate Change

California Fish and Game Code 1852(c)(13) states that an RCIS shall include "a description of how the strategy's conservation goals and objectives provide for adaptation opportunities against the effects of climate change for the strategy's focal species." Climate change is expected to increase the frequency of extreme events such as floods and fires, increase temperatures, increase drying, change precipitation patterns, and contribute to sea-level rise (Goals Project 2015) (Section 2.4.3, *Climate Change*).

The conservation strategy's conservation goals and objectives are designed to provide adaptation opportunities against the effects of climate change for the strategy's focal species and other conservation elements. The conservation strategy emphasizes the protection of large blocks of currently unprotected habitat that support occurrences of focal species near protected areas to reduce habitat fragmentation and preserve interconnected habitats. Increasing the amount of protected areas in the RCIS area and retaining and enhancing wildlife corridors will facilitate movement for focal species to future, shifting habitats. The conservation goals and objectives also target enhancement actions to improve the quality of habitats along a range of environmental gradients (e.g., east to west, north to south, and along elevational gradients). This RCIS also identifies management actions to simulate historic disturbance regimes (e.g., wildfire, grazing) that can be used to create a diversity of microhabitats across landscapes. Diverse native plant and animal communities that retain important ecological functions have a greater chance for persistence and change in response to climate shifts. In turn, these persistent communities will allow the focal species to move to areas containing favorable habitat conditions if their current locations become unsuitable (Beller et al. 2015). Each focal species and other conservation element conservation strategy in Sections 3.6 and 3.7, respectively, includes a subsection how the conservation strategy for that focal species or other conservation element provides for adaptations to climate change in the RCIS area.

3.5 Relationship between this RCIS and the Santa Clara Valley Habitat Plan

The Santa Clara County RCIS area overlaps all of the Habitat Plan's plan area in Santa Clara County (approximately 500,000 acres). Because the Habitat Plan provides regulatory federal and state Endangered Species Act (ESA) coverage for 11 species that are also Santa Clara County RCIS focal species (six wildlife species and five plant species), this RCIS was designed to be consistent with, and complementary to, the Habitat Plan to support collaborative conservation efforts that will help the Santa Clara Valley Habitat Agency achieve the Habitat Plan's biological goals and objectives.

This RCIS and the Habitat Plan have conservation and biological goals, objectives, and actions that aim to protect habitat and occurrences of species and enhance and restore habitat and natural communities. This RCIS and the Habitat Plan also include conservation and biological goals, objectives, and actions to protect and enhance corridors for movement by organisms through landscapes. This RCIS' goals, objectives, conservation actions, and habitat enhancement actions emulate those in the Habitat Plan, which provides a strong strategy for conservation of landscapes, natural communities, and focal species in the region. Therefore, all RCIS conservation goals, objectives, actions, and priorities are consistent with, and complementary to, the Habitat Plan's biological goals, objectives, and conservation actions for focal species, habitats, and natural communities that overlap between this RCIS and the Habitat Plan.

All RCIS focal species (Section 3.6, *Conservation Strategy for Focal Species*), habitats on serpentine soils (Section 3.7.3, *Serpentine Soils*), and unique land cover types (Section 3.7.4, *Unique Land Cover Types*) include quantitative land protection objectives. To avoid competing with the conservation strategy in the Habitat Plan, the quantitative land protection objectives for RCIS focal species, habitats on serpentine soils, and unique land cover types are exclusive of quantitative objectives from the Habitat Plan, as those resources must be available for the Habitat Agency to meet Habitat Plan requirements. This approach was used so that the quantitative conservation objectives in this RCIS are in addition to those commitments of the Habitat Plan for focal species, natural communities, and land cover types covered by the Habitat Plan. This RCIS's conservation goals and objectives for focal plant species do not include the protection of known occurrences within the Habitat Plan's plan area, as those will be protected through the Habitat Plan.

To build upon the conservation strategy in the Habitat Plan, this RCIS incorporates many Habitat Plan conservation actions into RCIS conservation actions, habitat enhancement actions, and priorities. For example, the RCIS prioritizes protection of focal species' habitat within and outside the Habitat Plan's plan area. Including and prioritizing conservation actions and habitat enhancement actions that overlap the Habitat Plan emphasizes the importance of these actions to protecting and enhancing populations of focal species and their habitats through collaborative efforts with the Santa Clara Valley Habitat Agency.

This RCIS prioritizes the protection of any known or newly discovered occurrences for focal species that are covered species under the Habitat Plan. Coordination with the Santa Clara Valley Habitat Agency on protection of any known and newly discovered occurrence inside the Habitat Plan's plan area would be beneficial to the conservation of these species. Occurrences should only be targeted for protection if protecting the occurrence(s) does not affect the Santa Clara Valley Habitat Agency's ability to achieve the goals and objectives of the Habitat Plan. Furthermore, because the Habitat Plan provides a comprehensive conservation strategy within the Habitat Plan's plan area, users of this RCIS should consider prioritizing conservation actions and habitat enhancement actions within the RCIS area, but outside the Habitat Plan's plan area, to complement the Habitat Agency's conservation work in the region. Close coordination with the Habitat Agency will be necessary throughout RCIS implementation. Entities and/or individuals seeking to create mitigation credits within the Habitat Plan's plan area must comply with California Fish and Game Code 1856(j). See Section 4.4.2.2 *Mitigation Credit Agreements and the Santa Clara Valley Habitat Plan*, for details.

3.6 Conservation Strategy for Focal Species

The conservation strategy for this Santa Clara County RCIS's focal species prioritizes protection of occupied habitat to protect existing populations of focal species. The conservation strategy also emphasizes the protection, enhancement, and restoration of focal species' habitat, as identified by the focal species habitat models (Section 3.3, *Conservation Gap Analysis and Conservation Targets*; Appendix H, *Focal Species Habitat Models*).

Although the conservation goals, objectives, priorities, and actions are specific to focal species, serpentine land cover types, and other unique land cover types (see Section 3.7, *Conservation Strategy for Other Conservation Elements*, for conservation strategies for serpentine and other unique land cover types), the following general principals of conservation biology (e.g., Soule and Wilcox 1980, Soule 1986, Primack 1993, Noss et al. 1997, Margules and Pressey 2000 Groom et al. 2006) should be used to further prioritize habitat protection actions.

- Protect occurrences of focal species and other conservation elements.
- Preserve large blocks of intact habitat.
- Focus protection in areas that expand existing protected areas and/or connect existing protected areas within the RCIS area and to existing protected areas adjacent to the RCIS area.
- Protect wildlife corridors and linkages.

The conservation objectives, actions, and priorities are discussed further below.

3.6.1 Central California Coast and South-Central California Coast Steelhead

3.6.1.1 Conservation Goals and Objective

Goal 1. Increase available habitat and the size of the Central California Coast steelhead and South-Central California Coast steelhead distinct populations occurring in the RCIS area.

Objective 1-1. Reduce the primary threats of habitat loss, degradation, and fragmentation by protecting stream habitat needed to meet the conservation target for Central California Coast steelhead (12 miles) and South-Central California Coast steelhead (43 miles) (Figure H-1, Appendix H, *Focal Species Habitat Models*).

- **Action CCC-1.** Acquire, through fee title purchase or conservation easement, floodplains and/or riparian corridor properties to protect habitat along stream channels.

Objective 1-2. Enhance and restore stream habitat and facilitate migration to spawning and rearing habitat on at least 15 miles of fish-bearing streams for Central California Coast steelhead and 11 miles of fish-bearing streams for South-Central California Coast steelhead.

- **Action CCC-2.** Survey streams identified as habitat, potential habitat, or fish scarce[8] for steelhead in Figure H-1, Appendix H, to identify restoration and enhancement opportunities.
- **Action CCC-3.** Conduct reconnaissance-level surveys on streams where additional data are needed, as indicated in Figure H-1, Appendix H, as “no data/extent unknown,” to evaluate the distribution of steelhead and assess habitat quality.

[8] Habitats that are dry during summer and fall but may serve as migration routes for steelhead.

- **Action CCC-4.** Remove or modify barriers to stream passage for steelhead and other aquatic species and reduce stream channelization to enable access to a wide variety of streams and habitats.
- **Action CCC-5.** Enhance and restore stream habitat identified as steelhead habitat in Figure H-1, Appendix H.
- **Action CCC-6.** Assess the condition of stream habitat mapped as estuarine in Figure H-1, Appendix H, and restore where needed through control of fill, waste discharges, in-stream flows, and riparian buffers.
- **Action CCC-7.** Design all new road crossings and crossing upgrades in areas of steelhead habitat in adherence to the National Marine Fisheries Service Anadromous Salmonid Passage Facility criteria and guidelines (National Marine Fisheries Service 2011), and also consult the California Salmonid Stream Habitat Restoration Manual, Part XII - Fish Passage Design and Implementation (California Department of Fish and Game 2009).
- **Action CCC-8.** Work with local flood control agencies (i.e., the Santa Clara Valley Water District) to develop and implement fish-friendly water operations to improve stream flows and temperatures for steelhead, especially on key dams (Almaden, Guadalupe, Anderson, Uvas, Llagas, and Pacheco Water District). As releases are scheduled to begin and end, they should be done slowly to avoid scouring or stranding eggs and larvae during the foothill yellow-legged frog egg-laying period.
- **Action CCC-9.** Work with private and public landowners to minimize in-stream mining in steelhead habitat and increase the complexity of stream resources (e.g., woody debris).
- **Action CCC-10.** Evaluate, and, where appropriate, increase the complexity of in-stream habitat, including spawning substrate and in-stream woody material
- **Action CCC-11.** Create, restore, and enhance riparian vegetation in stream reaches that support steelhead habitat.

3.6.1.2 Conservation Priorities

Prioritize actions in areas where the steelhead population has been identified as essential to recovery by the National Marine Fisheries Service (National Marine Fisheries Service 2013, National Marine Fisheries Service 2016).

- For South-Central California coast steelhead, all populations in the Pajaro River watershed (i.e., all CPUs with creeks within the Pajaro River watershed that support steelhead).
- For Central California Coast steelhead, all populations in San Francisquito Creek, Guadalupe River, Stevens Creek, and Coyote Creek.

Prioritize actions on streams labeled as estuarine on Figure H-1, Appendix H, in the San Francisco Bay CPU to protect, enhance, and restore important bayland habitat for steelhead (National Marine Fisheries Service 2016). Partner with the San Francisco Bay National Wildlife Refuge, when appropriate.

Work with Caltrans, California Department of Fish and Wildlife, National Marine Fisheries Service, Santa Clara Valley Water District, and other stakeholders to implement habitat improvement projects and remove or modify barriers to fish passage. Recent and ongoing work by the Santa Clara

Valley Water District and other entities should be used to identify priority sites for habitat improvement actions such as gravel augmentation and placement of large woody debris (LWD) (Balance Hydrologics 2018) and removal or modification of barriers to fish passage (e.g. Domenichelli & Associates Civil Engineering 2017). Other sources, such as CDFW's Fish Passage Assessment Database and Fish Passage Priorities List (California Department of Fish and Wildlife 2017b) and the California Department of Fish and Game, California Salmonid Stream Habitat Restoration Manual, Part XII Fish Passage Design and Implementation (Flosi et al. 1998) should be used to help determine fish passage priorities and serve as a guide for habitat restoration and enhancement, respectively. Priority enhancement projects in RCIS area streams include the following.

- Stevens Creek:
  - address Fremont Drop and fish ladder barrier, which is tall and narrow and becomes clogged with debris because of sediment buildup (Smith, J., pers. comm.);
  - improve Moffett Drop Structure fish ladder, which is old and clogs with sediment and debris; and,
  - prioritize areas in Stevens Creek which could benefit from habitat enhancement including addition of spawning gravels, installation of fish habitat and LWD structures (California Department of Fish and Wildlife, pers. comm.).
- Coyote Creek:
  - address stream crossing with apron and culvert barrier at Singleton Road (slightly upstream of Capitol Expressway);
  - address largemouth and spotted bass in, and increased water temperatures released from, Ogier Ponds (e.g., by taking ponds off-channel);
  - separate the stream channel from quarry pond 10B;
  - add spawning gravels to the reach nearest Anderson Reservoir;
  - restore habitat complexity for up to 5 miles below Anderson Dam;
  - remove barriers between McKee Road and Metcalf Road (Smith, J., pers. comm.);
  - reduce hydrology effects from old quarry operations; and
  - identify key areas in Coyote Creek that could benefit from habitat enhancement including addition of spawning gravels, installation of fish habitat, and LWD structures (California Department of Fish and Wildlife, pers. comm.).
- Uvas Creek:
  - address trestle apron at the Southern Pacific tracks at Bolsa Road;
  - address Solis Creek flows (tributary to Uvas Creek), which could benefit from increased stream flows via a small pipeline that could capture stream flows from Uvas Reservoir;
  - modify or remove dam and fish ladder on Little Arthur Creek (Smith, J., pers. comm.);
  - identify key areas in Uvas Creek that could benefit from habitat enhancement including addition of spawning gravels, installation of fish habitat, and LWD structures; and

- work with landowners with water diversions to improve stream flows on Uvas Creek and its tributaries (California Department of Fish and Wildlife, pers. comm.).

- Penetencia Creek:
  - address the small (3 feet) waterfall which limits upstream fish passage in Penitencia Creek and separates the Santa Clara Valley Transportation Authority's Alum Rock Park mitigation project from upstream habitat (Smith, J., pers. comm.);
  - work with City of San José to develop an operations agreement for Cherry Flat Reservoir that will improve flows for steelhead in Upper Penitencia Creek; and
  - identify key areas in Penitencia Creek that could benefit from habitat enhancement, including addition of spawning gravels, installation of fish habitat, and LWD structures (California Department of Fish and Wildlife, pers. comm.).
- Pajaro River:
  - restore the river's riparian corridor and improve fish habitat on the north side of California State Route (SR) 25 (Smith, J., pers. comm.).
- Guadalupe River and Guadalupe Creek:
  - remove barriers to passage downstream of reservoirs in the Guadalupe River watershed listed as Priority 1 or Priority 2 in the *Steelhead Migration Barrier Survey of San Francisco Bay Area Creeks (Contra Costa, Alameda, Santa Clara, and San Mateo Counties* (Cleugh and McKnight 2002);
  - separate the Almaden Lake stream channel (Alamitos Creek) from flowing through Almaden Lake; and
  - identify key areas in the Guadalupe River that could benefit from habitat enhancement, including addition of spawning gravels, installation of fish habitat, and LWD structures (California Department of Fish and Wildlife, pers. comm.).

3.6.1.3 Opportunities for Adaptation to Climate Change

When considering climate change, the biggest concern for fish species generally, and anadromous species specifically, is that there will be less precipitation, and thus less stream flow, or that precipitation will fall in patterns different from how it has fallen historically, and that stream flow will not be adequate during key migration and spawning periods (Moyle et al. 2012). Also, there is a concern that if the climate is drier and warmer, that will reduce in-stream habitat quality for fish, especially fish that require cold water habitats, as water temperatures become warmer. Secondarily, in a drier climate, there is the potential for an increase in fire frequency and intensity, which can result in an increased sediment load reaching streams during storm events, further reducing in-stream habitat quality for fish species.

Moyle et al. (2012) found that both native and alien fish species in the San Francisco Bay Area would be negatively affected by climate change overall, but that by 2100, native fish populations will be in much worse condition than alien fish species. It is further predicted that overall habitat for native fish species will be reduced over time as a higher proportion of a shrinking amount of water is shifted towards impoundment for controlled use (Moyle et al. 2012). The situation is exacerbated by the inability of native fishes to move into new parts of streams because of barriers to movement (Moyle et al. 2012).

The overall intent of the conservation strategy for Central California Coast and South-Central California Coast is to improve in-stream habitat by creating more fish-friendly water release practices below reservoirs and through stream and riparian restoration actions. Another focus of the conservation strategy is to increase access to stream habitat through removal of barriers. These actions aimed at improving existing habitat or increasing access to new stream reaches will help to mitigate the effects of declining habitat conditions due to climate change. Improved water releases and riparian restoration of shade-providing vegetation along fish-bearing streams will help moderate water temperatures and provide cooler-water refuge in a warming climate.

3.6.2 California Tiger Salamander

3.6.2.1 Conservation Goals and Objectives

Goal 2. Increase the size of California tiger salamander populations and maintain native genetic structure in the populations within the RCIS area (U.S. Fish and Wildlife Service 2017).

Objective 2-1. Protect at least 11 preserves, each at least 3,398 acres in size, containing at least four breeding ponds in areas not dominated by hybrid or non-native tiger salamanders, distributed across the California tiger salamander management units overlapping the RCIS area identified in the *Recovery Plan for the Central California Distinct Population Segment (DPS) of the Tiger Salamander* (U.S. Fish and Wildlife Service 2017).[9]

- **Action CTS-1.** Acquire parcels with known breeding occurrences of California tiger salamander and parcels that feature suitable habitat for California tiger salamander through fee title purchase or conservation easement.

Objective 2-2. In addition to Objective 2-1, protect habitat needed to meet this RCIS's conservation targets, including 400 acres of occupied breeding habitat, 32,100 acres of occupied upland habitat, 1,300 acres of breeding habitat, and 163,900 acres of upland habitat (Figure H-2, Appendix H, *Focal Species Habitat Models*).

- **Action CTS -2.** Acquire unprotected parcels with California tiger salamander habitat through fee title purchase or conservation easement.

Objective 2-3. Enhance California tiger salamander breeding and habitat.

- **Action CTS-3.** Improve upland habitat through the reduction of invasive plant growth and by promoting land management practices that will positively benefit California ground squirrels and other fossorial mammals that create burrows used by California tiger salamander.

[9] There are six Central California tiger salamander management units overlapping the RCIS area. The *Recovery Plan for the Central California Distinct Population Segment of the Tiger Salamander* (U.S. Fish and Wildlife Service 2017) recommends protecting four to five preserves in each management unit for a total of 29 preserves. This RCIS prorates the number of preserves to protect within each management unit in the RCIS area based approximately on the proportion of the management unit overlapping the RCIS area as follows: five preserves in the Northwest Diablo Range; four preserves in the Santa Cruz Mountains management unit; one preserve in each of the North Diablo Range and Northeast Diablo Range management units; and none in the Southwest Diablo Range and Southeast Diablo Range management unit, which barely extend into the RCIS area.

- **Action CTS-4.** Use livestock grazing in California annual grassland, blue oak woodland, or other suitable habitat types to maintain grass heights low enough to allow for overland movement by California tiger salamander.
- **Action CTS-5**. Maintain ponds or areas of ponds with none to minimal vegetation by allowing livestock access to ponds or other means (e.g., mechanical removal, fire) (Ford et al. 2013). If it is determined that livestock are negatively impacting California tiger salamander habitat, decrease grazing intensity throughout the year in suitable habitats. If that does not solve the issue, install fencing to reduce grazing pressure and exclude feral pigs from California tiger salamander aquatic breeding habitat. Fence installation should be carefully applied to avoid negatively affecting small mammal movement and upland habitat.
- **Action CTS-6.** Eradicate exotic wildlife species such as bullfrogs, mosquitofish, other non-native predatory fish, and non-native turtles and salamanders from breeding ponds.
- **Action CTS-7.** Cease the use of rodenticides on protected lands, except where needed to retain structural integrity of infrastructure (e.g., earthen dams), particularly in grasslands, to maintain a source of burrows for California tiger salamander.
- **Action CTS-8.** Incorporate measures in management and monitoring plans to ensure ranaviruses, chytrid fungus, or other pathogens are not introduced to California tiger salamander habitat. Measures include ensuring that pathogen hosts are not introduced, and protocols for sterilization of field equipment (U.S. Fish and Wildlife Service 2017).

Objective 2-4. Restore or create California tiger salamander breeding habitat.

- **Action CTS-9.** Survey suitable habitat to identify opportunities for habitat protection, restoration, and/or creation.
- **Action CTS-10.** Plant native emergent vegetation around the perimeter of ponds and wetlands that have little to no vegetation to provide aquatic cover and substrate for attaching eggs. Ponds should be grazed or otherwise managed, however, to ensure vegetation is not too dense and reduces habitat quality (U.S. Fish and Wildlife 2017, U.S. Fish and Wildlife, pers. comm.).
- **Action CTS-11.** Improve the hydroperiod and water quality of ponds by clearing dense stands of non-native vegetation, repairing eroding dams and spillways, and removing sediment, where appropriate (Ford et al. 2013).
- **Action CTS-12.** Create ponds to provide suitable California tiger salamander breeding habitat.

Objective 2-5. Assess the extent of California tiger salamander hybridization in the RCIS area and manage California tiger salamander–barred tiger salamander hybrids according to wildlife agency guidance.

- **Action CTS-13.** Monitor ponds to assess the presence of hybrid tiger salamanders.
- **Action CTS-14.** Manage and restore ponds and to provide habitat that favors native California tiger salamanders over hybrids, such as drying ponds late summer-early fall, as guided by the best available science (ICF International 2012, California Tiger Salamander Science Advisory 2017, U.S. Fish and Wildlife 2017). Because some species, such as tricolored blackbird and California red-legged frog, rely on aquatic habitat with longer-hydroperiods, ponds occupied by California tiger salamander, or ponds near occupied habitat (and not

used as nesting habitat by tricolored blackbirds) should be strategically managed to have seasonal ponding durations. Managing ponds to dry out in September – October would discourage bullfrogs, fish, and non-native tiger salamanders while still allowing successful tricolored blackbird and California red-legged frog breeding (U.S. Fish and Wildlife, pers. comm.).

3.6.2.2 Conservation Priorities

- Prioritize protection of large patches of occupied habitat (at least 3,398 acres) containing at least four breeding ponds in areas not dominated by hybrid or non-native tiger salamanders, distributed across the California tiger salamander management units overlapping the RCIS area (U.S. Fish and Wildlife 2017).
- Prioritize protection of unprotected critical habitat in the following CPUs (ICF International 2012): Arroyo Hondo, Lower Coyote Creek–Frontal San Francisco Bay Estuaries, Upper Coyote Creek, Guadalupe River–Frontal San Francisco Bay Estuaries, Llagas Creek, Uvas Creek, Pacheco Creek, and Pajaro River (Figure H-2, Appendix H, *Focal Species Habitat Models*).
- Using the actions described above, enhance and restore protected breeding habitat in the following locations.
  - Northern and southern Upper Coyote Creek CPU, which has the highest documented density of California tiger salamander in the RCIS area and overlaps designated critical habitat, with emphasis on the Coyote Valley Open Space Preserve (ICF International 2012).
  - Southern Henry W. Coe State Park, which includes critical habitat. Upland habitat would benefit from grazing and stock ponds would benefit from management actions to enhance breeding habitat (ICF International 2012, U.S. Fish and Wildlife Service, pers. comm.).
- Prioritize assessing the feasibility of restoring breeding and upland habitat in and surrounding Laguna Seca and Fisher Creek to support habitat for a variety of listed and non-listed amphibians and reptiles, including California red-legged frog, California tiger salamander, and western pond turtle. If results of an assessment indicate that habitat can be successfully and feasibly restored, restore habitat for California red-legged frog, California tiger salamander, western pond turtle, and other native species in this area (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017).

3.6.2.3 Opportunities for Adaptation to Climate Change

California tiger salamander has adapted a life history strategy to deal with highly variable annual rainfall events and droughts (U.S. Fish and Wildlife Service 2017). Breeding success is tied very closely to rainfall amount and timing, as adults generally migrate to breeding ponds during rainy nights between November and April (Trenham et al. 2001). Drought, and changes in precipitation and temperature, may prevent ponds from filling, or cause ponds to dry out before larvae transform and can emerge from aquatic habitats. Although the longevity of adult California tiger salamander may be sufficient to enable populations to withstand droughts within the historic range of duration and intensity (Barry and Shaffer 1994), it may not be sufficient to withstand extreme droughts that may occur with climate change (U.S. Fish and Wildlife Service 2017).

Wright et al. (2013) estimated that the California tiger salamander was at "intermediate risk" from climate change. Modeled under four climate change scenarios, it was estimated that 20 - 80% of current California tiger salamander occurrences would persist through 2050, but that 20 - 99% of modeled habitat would no longer be climatically suitable. Across the four climate change scenarios, the predicted range of future climatically suitable habitat varied from nearly all of the current habitat in the RCIS area remaining suitable (particularly in the Diablo Range), to a large amount of habitat loss, with a patchy distribution of remaining habitat.

The overall intent of the conservation strategy for California tiger salamander is to protect existing occurrences, enhance habitats to improve productivity, and protect and manage larger blocks of habitat so that individuals will have access to other habitat areas, should conditions at historical locations change. Several of the actions are focused on the intensive management of surface water resources used for breeding by California tiger salamander. Ensuring that water is available in breeding ponds long enough during the breeding season to allow young to emerge from aquatic habitat may be necessary to maintain California tiger salamanders in a changing climate.

3.6.3 Foothill Yellow-Legged Frog

3.6.3.1 Conservation Goals and Objectives

Goal 3. Increase the foothill yellow-legged frog population in the RCIS area.

Objective 3-1. Protect known breeding locations of foothill yellow-legged frog and allow for expansion by protecting suitable breeding and movement habitat upstream, downstream, and into surrounding watersheds.

- **Action FYLF-1.** Acquire parcels with known occurrences of foothill yellow-legged frog through fee title purchase or conservation easement.
- **Action FYLF-2.** Survey suitable habitat to identify opportunities for habitat protection, restoration, and/or creation.

Objective 3-2. Reduce the threat of habitat loss by protecting the habitat needed to meet this RCIS's conservation target for breeding and foraging habitat (12,200 acres) and low-use habitat (1,800 acres) (Figure H-3, Appendix H, *Focal Species Habitat Models*).

- **Action FYLF-3.** Acquire land along streams that currently have, or historically had, suitable habitat for foothill yellow-legged frog upstream of reservoirs (except where foothill yellow-legged frogs occur downstream of reservoirs), which is characterized by perennial flows and cobblestone substrate along with intermittent and ephemeral streams that connect to those perennial streams.

Objective 3-3. Enhance foothill yellow-legged frog habitat within the same watershed of documented occurrences upstream of reservoirs (except where foothill yellow-legged frogs occur downstream of reservoirs).

- **Action FYLF-4.** Enhance seasonal breeding habitat by managing reservoir releases to mimic a natural hydrograph. As releases are scheduled to begin and end, they should be done slowly to avoid scouring or stranding eggs and larvae during the foothill yellow-legged frog egg-laying period.

- **Action FYLF-5.** Control exotic species such as bullfrogs, mosquitofish, crayfish, non-native predatory fish, and non-native turtles by periodically draining perennial ponds.
- **Action FYLF-6.** Plant native understory and overstory riparian vegetation within 15 feet of the edge of the low-flow channel to create partially shaded areas with sunny spots for basking and foraging.
- **Action FYLF-7.** Replace concrete, earthen or other engineered channels to restore floodplain connectivity and commensurate functions.
- **Action FYLF-8.** Increase the amount of cobblestone substrate suitable to support breeding foothill yellow-legged frogs in areas close to known occurrences of foothill yellow-legged frog.
- **Action FYLF-9.** Census egg masses in breeding habitat downstream of reservoirs before and after releases to determine whether egg masses are lost. Census tadpoles in the fall months to assess recruitment, as pulse flows for power generation or rafting can threatened population numbers.
- **Action FYLF-10.** Evaluate recreational impacts within known breeding habitat and implement seasonal closures in locations where recreation may be directly impacting foothill yellow-legged frog.
- **Action FYLF-11.** Foothill yellow-legged frogs are sensitive to some pesticides and herbicides (Center for Biological Diversity 2015). Minimize herbicide and pesticide use in protected lands adjacent to streams occupied by foothill yellow-legged frog.

3.6.3.2 Conservation Priorities

- Protect known occurrence of foothill yellow-legged frog in the RCIS area (ICF International 2012).
- Protect and enhance the following creek segments (Figure H-3, Appendix H) (ICF International 2012).
  - Uvas/Carnadero Creek above Uvas Reservoir, Uvas Creek below Uvas Reservoir, and Little Arthur Creek (Uvas Creek CPU).
  - Small creeks above Calero Reservoir (Guadalupe River–Frontal San Francisco Bay Estuaries).
  - Alamitos and Guadalupe Creeks upstream and outside of urban San José (Guadalupe River–Frontal San Francisco Bay Estuaries CPU).
  - Llagas Creek above Chesbro Reservoir (Llagas Creek CPU).
  - San Felipe Creek, above Anderson Reservoir (Upper Coyote Creek CPU).
  - Upper Penitencia Creek (Lower Coyote Creek–Frontal San Francisco Bay Estuaries CPU).
  - Coyote Creek and its tributaries within the Palassou Ridge Open Space Preserve (Upper Coyote Creek CPU).

3.6.3.3 Opportunities for Adaptation to Climate Change

As with fish species, the biggest concern for amphibians that primarily use stream habitats is that there will be less precipitation, and less stream flow, or that precipitation will fall in patterns different from how it has fallen historically, and that stream flow will not be adequate during reproduction periods. In a drier and warmer climate, in-stream habitat quality for foothill yellow-legged frog may decline.

Wright et al. (2013) estimated that the foothill yellow-legged frog was at "neutral risk" from climate change across the state. That estimate was based on the likely persistence of current populations through to 2050, and the amount of currently climatically suitable habitat likely to remain suitable by 2050. Both conditions (i.e., the likelihood of population persistence and the climatic suitability of habitat by 2050) were examined under four climate change scenarios, so there is considerable variability in the predictions. It was estimated that greater than 80% of current foothill yellow-legged frog occurrences are likely to persist through 2050 under all four climate scenarios. It was further determined that less than 20% of currently climatically suitable habitat would become unsuitable by 2050. There was strong consensus across the models, under all four climate change scenarios, that habitat in the RCIS area that is currently climatically suitable, would remain suitable. Despite that, it is still assumed that the availability of water in stream systems will remain a limiting factor for the species in the future, as it is now, and that conditions could worsen under drier conditions.

The overall intent of the conservation strategy for foothill yellow-legged frog is to improve in-stream habitat by creating more frog-friendly water release practices below reservoirs and through stream and riparian restoration actions above and below reservoirs. Another focus of the conservation strategy is to increase access to stream habitat through removal of barriers, as described in the conservation strategy for habitat connectivity and landscape linkages (Section 3.7.1, *Habitat Connectivity and Landscape Linkage*) and conservation strategy for Central California Coast and South-Central California Coast Steelhead (Section 3.6.1, *Central California Coast and South-Central Coast Steelhead*). The actions aimed at improving existing habitat or improving access to stream reaches will help to mitigate the effects of declining habitat conditions due to climate change.

3.6.4 California Red-Legged Frog

3.6.4.1 Conservation Goals and Objectives

Goal 4. Increase the California red-legged frog population in the RCIS area.

Objective 4-1. Protect known breeding locations of California red-legged frog and allow for expansion of metapopulations by protecting suitable breeding habitat within typical movement distance of known breeding locations (approximately 2 miles).

- **Action CRLF-1.** Acquire parcels with known breeding occurrences and adjacent dispersal/refugia habitat for California red-legged frog.
- **Action CRLF-2.** Survey suitable habitat to identify opportunities for habitat protection, restoration, and/or creation.

Objective 4-2. Reduce the threat of habitat loss and non-native species by protecting the habitat needed to meet this RCIS's conservation target for breeding habitat (1,800 acres), refugia habitat (10,700 acres), and dispersal habitat (252,600 acres) (Figure H-4, Appendix H, *Focal Species Habitat Models*).

- **Action CRLF-3.** Acquire unprotected parcels containing California red-legged frog habitat through fee title purchase or conservation easement.

Objective 4-3. Enhance California red-legged frog habitat.

- **Action CRLF-4.** Enhance breeding habitat by managing ponds to support a mix of open surface water and emergent vegetative cover for California red-legged frogs (Ford et al. 2013).
- **Action CRLF-5.** Improve upland habitat through the reduction of invasive plants and by promoting land management practices that will maintain herbaceous plant heights low enough to allow for overland movement.
- **Action CLRF-6.** Remove exotic species such as bullfrogs, mosquitofish, other non-native predatory fish, and non-native turtles from breeding ponds and stream segments. Pond management strategies such as having seasonal dry periods by the end of September - October would remove and discourage non-native predators.
- **Action CRLF-7.** Manage grazing to reduce impacts from cattle on California red-legged frog habitat. Decrease grazing intensity throughout the year in suitable habitats. If that does not solve the issue, install fencing around suitable aquatic breeding habitat to exclude cattle. Fence installation should be carefully applied to avoid negatively affecting small mammal movement and upland habitat.
- **Action CLRF-8.** Increase the amount of California red-legged frog breeding habitat in creeks through the creation of more plunge pools and slow-water habitats by incorporating these features in restoration designs in suitable breeding habitat in creeks.

Objective 4-4. Restore and create California red-legged frog breeding, dispersal, and refugia habitat on protected land in the RCIS area.

- **Action CRLF-9.** Establish native emergent vegetation around the perimeter of ponds and wetlands to provide breeding habitat for California red-legged frog where little to none exists. Ponds should be grazed or otherwise managed, however, to ensure vegetation is not too dense and reduces habitat quality (U.S. Fish and Wildlife Service 2017, U.S. Fish and Wildlife Service, pers. comm.).
- **Action CRLF-10.** Improve the hydroperiods and water quality of natural ponds and streams, and stock ponds for California red-legged frog by clearing dense stands of non-native vegetation (while retaining vegetation around the fringes of ponds used by tricolored blackbird for nesting), repairing eroding dams and spillways, and removing sediment, where appropriate (Ford et al. 2013).
- **Action CRLF-11.** Enhance seasonal breeding habitat by managing reservoir releases to mimic a natural hydrograph. As releases are scheduled to begin and end, they should be done slowly to avoid scouring or stranding eggs and larvae during the California red-legged frog egg-laying period (California Department of Fish and Wildlife, pers. comm.).

3.6.4.2 Conservation Priorities

- Within the Arroyo Hondo, Lower Coyote Creek–Frontal San Francisco Bay Estuaries, Upper Coyote Creek, and Pacheco Creek CPUs (Figure H-4, Appendix H, *Focal Species Habitat Models*), prioritize protection of unprotected critical habitat and designated core areas (STC-1, STC-2, ALA-2) (U.S. Fish and Wildlife Service 2010a) that provide breeding and refugia habitat in the following locations.
    - Coyote Ridge on the western edge of Upper Coyote Creek CPU.
    - Coyote Valley, between San José and Morgan Hill in Lower Coyote Creek–Frontal San Francisco Bay Estuaries.
    - Eastern edge of Pacheco Creek CPU, along the county line.
- Prioritize the protection of isolated breeding populations with limited habitat protection in the following locations (California Department of Fish and Wildlife, California Natural Diversity Database 2019, ICF International 2012).
    - South of Gilroy in the southern Uvas Creek CPU.
    - West of SR 25 in the Pajaro River CPU.
- Using the actions described above, enhance protected breeding and upland habitat in the following locations (ICF International 2012).
    - Henry W. Coe State Park, which includes critical habitat. Upland habitat would benefit from grazing and stock ponds would benefit from management actions to enhance breeding habitat (ICF International 2012, U.S. Fish and Wildlife, pers. comm.).
    - The southern portion of Upper Coyote Creek CPU and northwestern Pacheco Creek CPU, which contains the highest density of documented populations of California red-legged frog and coincides with most of the designated critical habitat in the RCIS area, with emphasis on the Coyote Valley Open Space Preserve.
    - Northern Upper Coyote Creek CPU and western Arroyo Hondo CPU.
- Prioritize assessing the feasibility of restoring breeding and upland habitat in and surrounding Laguna Seca and Fisher Creek to support habitat for a variety of listed and non-listed amphibians and reptiles, including California red-legged frog, California tiger salamander, and western pond turtle. If results of a feasibility assessment indicate that habitat can be successfully and feasibly restored, restore habitat for California red-legged frog, California tiger salamander, western pond turtle, and other native species in this area (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017).
- Prioritize habitat protection, enhancement, and protection within occupied habitat or suitable habitat (or habitat that could be made suitable) that is within 2 miles of occupied habitat (Section 2.2.5.3, *Focal Species Profiles, California Red-legged Frog, Ecological Requirements*), to increase the likelihood that it will be colonized by California red-legged frog (U.S. Fish and Wildlife 2010a, ICF International 2012).
- Develop and implement a long-term monitoring program to detect changes in population status and identify the factors causing changes, such as disease, habitat loss, and climate change (Wright et al. 2013).

3.6.4.3 Opportunities for Adaptation to Climate Change

Similar to California tiger salamander, California red-legged frog has adapted a life history strategy to deal with California's highly variable annual rainfall events and droughts. California red-legged frog breeding success is tied very closely to rainfall amounts and timing: enough rainfall must fall to provide enough water in streams or ponds during the breeding season, and to ensure that ponding persists long enough for eggs to hatch and young to develop. California red-legged frogs have the added advantage of moving overland for great distances to seek out water sources, but they are restricted by the need for some form of perennial water source. This adaptation itself will allow California red-legged frog to persist in a changing climate, at least at the metapopulation level, though individual frogs or breeding locations may no longer be able to persist. Likely the greatest threat to frogs in the future would be a persistent regional drought. A drought on a regional level could depress habitat quality at breeding locations across the landscape. If that drought persisted for many years it may be difficult for one or more metapopulations of California red-legged frog to persist, particularly if they are facing other stresses.

Wright et al. (2013) estimated that the California red-legged frog was at "neutral risk" from climate change across the state. Modeled under four climate change scenarios, it was estimated that in California less than 20% of currently climatically suitable habitat (i.e., climatic conditions under which the species can persist) would become unsuitable by 2050, and that greater than 80% of current California red-legged frog occurrences were likely to persist through 2050. There was strong consensus across the models, under all four climate change scenarios, that all of the habitat in the RCIS area that is currently climatically suitable, would remain climatically suitable. However, even though current occurrences are likely to persist and habitat that is currently climatically suitable will likely remain so, climatic conditions are expected to change enough to reduce habitat suitability on average to make California red-legged frog a high priority for monitoring and additional studies.

Protecting existing occurrences, enhancing those habitats to improve breeding productivity, and protecting and managing larger blocks of habitat so that individuals will have access to other habitat areas - should conditions at historical locations change - are all important tools for land managers to provide adaptations to climate change. Because most of the habitat and many of the known occurrences in the RCIS area are likely to persist through at least 2050, focusing on the protection of known occurrences and suitable habitat is a sufficient strategy for allowing California red-legged frog to adapt to climate change. Furthermore, restoration and enhancement efforts will help to offset the effects of warmer, drier climates. Shifts in habitat should not be sudden or extreme in the RCIS area, giving populations time to shift to new habitat areas, provided they are protected and accessible. Several of the actions are focused on the intensive management of surface water resources used for breeding by California red-legged frog. Providing for enough duplication of breeding sites on protected lands will ensure that in any given year there will be source populations, even when some breeding sites may be too dry. Protecting and managing California red-legged frog habitat across the RCIS area, as described in the conservation priorities, will ensure enough variability across the landscape that the population as whole will persist, even is some locations become less suitable.

3.6.5 Tricolored Blackbird

3.6.5.1 Conservation Goals and Objectives

Goal 5. Increase the number of tricolored blackbird nesting colonies and the amount of suitable tricolored nesting habitat and foraging and wintering habitat in the RCIS area.

Objective 5-1. Protect tricolored blackbird nesting habitat that supports, historically supported, or could support tricolored blackbird colonies.

- **Action TRBL-1.** Protect and manage tricolored blackbird nesting habitat.
- **Action TRBL-2.** Survey suitable nesting habitat to identify opportunities for habitat protection, restoration, and/or creation.

Objective 5-2. Reduce the threat of habitat loss by protecting the habitat needed to meet this RCIS's conservation target for nesting habitat (4,400 acres) and foraging and wintering habitat (54,300 acres) (Figure H-5, Appendix H, *Focal Species Habitat Models*).

- **Action TRBL-3.** Acquire parcels with unprotected tricolored blackbird colony sites and those with suitable nesting habitat through fee title or conservation easement.
- **Action TCBL-4.** Acquire agricultural easements on suitable agricultural foraging and wintering habitat surrounding tricolored blackbird nest colonies to protect tricolored blackbird foraging and wintering habitat.
- **Action TCBL-5.** Implement an annual monitoring program, in coordination with local conservation groups such as the Santa Clara Valley Audubon Society, to survey for tricolored blackbird nesting colonies in suitable nesting habitat, to identify nesting colonies and tricolored blackbird habitat use, and to inform habitat protection, enhancement, restoration, and management.

Objective 5-3. Enhance tricolored blackbird nesting and foraging and wintering habitat.

- **Action TRBL-6.** Manage pond sediment and stream flow (where feasible) to ensure ponds retain enough water from March through June to provide nesting substrate that is partially inundated to minimize access to nests by terrestrial predators.
- **Action TRBL-7.** Manage vegetation around the fringes of nesting ponds so that it retains suitable structure to support a nesting colony but does not reduce pond capacity to the point where active nests are vulnerable to depredation.
- **Action TRBL-8.** In wetland complexes that support nest colonies, manage non-native invasive plants so that native vegetation that provides suitable nesting substrate can develop.
- **Action TRBL-9.** Incentivize (e.g., through Safe Harbor Agreements) private landowners to promote pond and marsh land management practices that will improve tricolored blackbird breeding habitat and maintain foraging habitat.

3.6.5.2 Conservation Priorities

- Prioritize protection of active or recently active (e.g., used within previous 10 years) colony sites (Tricolored Blackbird Working Group 2007, California Department of Fish and Wildlife 2018a), as identified in the Tricolored Blackbird Portal (UC Davis 2018) or other sources. Recently active colonies are located in the Guadalupe River-Frontal San Francisco Bay Estuaries CPU and straddling the Pajaro River and Pacheco Creek CPUs.
- Protect and enhance foraging habitat surrounding active or recently active colony sites (Tricolored Blackbird Working Group 2007, California Department of Fish and Wildlife 2018a).
- Fund surveys of historically documented colony sites to understand presence/absence patterns in the RCIS area (Tricolored Blackbird Working Group 2007).

3.6.5.3 Opportunities for Adaptation to Climate Change

Gardali et al. (2012) ranked the climate vulnerability of 358 California bird species. Those rankings were based on both the exposure and sensitivity that a species has to climate change, based on the current understanding of their life history. Exposure to climate change was based on expected changes in habitat suitability, changes in food availability, and exposure to extreme weather. Sensitivity to climate change was based on a species' habitat specialization, physiological tolerance, migratory status, and dispersal ability. Analyses were only conducted on the portion of a species' life history spent in California. In that assessment, Climate Vulnerability Scores ranged from 12 – 72, with a median score of 24. All species with a score of 30 or higher (128 species) were considered prioritized taxa and given a ranking of low, moderate, or high vulnerability to climate change. Tricolored blackbird was given a score of 25 and was not considered an immediate conservation priority due to a relatively low Climate Vulnerability Score (Table 3-4). This finding conflicts with recent research, however, that modeled current and predicted future range of North American birds under different climate change scenarios and found tricolored blackbird to be highly vulnerable to climate change (Wilsey et al. 2019).

Table 3-4. Climate Vulnerability Scoring for Tricolored Blackbird as Described in Gardali et al. (2012)[a]

Criteria	Score[b, c]
Exposure	
Habitat suitability	2 – moderate; habitat suitability is expected to decrease by 10–50%
Food availability	1 - low; food availability for taxon would be unchanged or increase
Extreme weather	2 – moderate; taxon is expected to be exposed to some increase in extreme weather events
Sensitivity	
Habitat specialization	2 – moderate; taxon that tolerates some variability in habitat type or element
Physiological tolerance	1 – low; minimal or no evidence of physiological sensitivity to climatic conditions
Migratory status	1 - low; year-round resident
Dispersal ability	1 – low; taxon with high dispersal ability

Notes:

[a] Additional information about species scoring, including the database of scores is located here: http://data.prbo.org/apps/bssc/index.php?page=climate-change-vulnerability.

[b] Scores range from 1 – 3; generally low, medium, and high.

[c] Climate vulnerability score = Sum of exposure score X Sum of sensitivity score.

Despite conflicting assessments about whether tricolored blackbird is among the most vulnerable bird species to climate change, in the RCIS area, already marginal breeding habitat could be further stressed under warmer and drier conditions. As described in CDFW's Status Review of the Tricolored Blackbird in California (California Department of Fish and Wildlife 2018a), water availability and precipitation are predicted to decrease in the future, likely reducing freshwater emergent wetlands and the availability of nesting habitat. Climate change impacts to wetlands may also include alterations of recharge timing, changes in plant communities, and changes in the abundance of prey, further stressing the blackbirds (PRBO Conservation Science 2011). Also, nesting substrates that are protected from land predators, because ponded habitat surrounds them, may no longer be surrounded, subjecting nests to higher levels of depredation and rendering habitat unsuitable. Extreme weather, including flooding, wind, and severe spring storms may cause the mass mortality of nests, reducing or eliminating colony reproductive success.

Projections of habitat suitability models developed under current and future conditions are equivocal. Models run by Wilsey et al. (2019) found tricolored blackbird to be highly vulnerable to climate change, whereas models created by Point Blue Conservation Science (2017) had different outcomes. A projected future distribution model using the GFDL CM2.1 climate model projects little change in probability of occurrence in most of the RCIS area, whereas the model using the NCAR CCSM3.0 climate model projects an increase in the probability of occurrence in the Santa Clara Valley and valleys in the Diablo Range (Point Blue Conservation Science 2017).

By focusing on protection of known nesting locations and expansion of protections and management of foraging habitat surrounding those nesting locations, the conservation strategy aims to provide suitable nesting habitat in locations where this species is known to occur. By expanding protections to new areas, it builds repetition into the region so that if historic nest locations are no longer viable due to warmer and drier conditions, other ponds and wetlands that remain viable will be protected and managed for the species. Further, actions to actively manage ponds and wetland to ensure that the proper nesting substrate is present and that ponds retain the proper ponding duration will help offset any negative effects that warmer and drier conditions might have on nest locations.

3.6.6 Burrowing Owl

3.6.6.1 Conservation Goals and Objectives

The Santa Clara Valley Habitat Agency has been implementing a broad recovery program for burrowing owl within the RCIS area and adjacent sites since 2013. This recovery program addresses all known and potentially suitable habitat for the species in most of Santa Clara County. Because the Habitat Plan is so comprehensive, the following conservation goals and objectives only apply to the subset of the RCIS area not covered by the Habitat Plan (ICF International 2012), including Henry W. Coe State Park in Santa Clara County and the Alameda watershed in northeastern Santa Clara County.

Goal 6. Increase the size and persistence of breeding populations and increase the distribution of breeding and wintering burrowing owls in the RCIS area.

Objective 6-1. Protect and monitor all burrowing owl nest sites, including surrounding overwintering only or potential nesting/overwintering habitat (Figure H-6, Appendix H, *Focal Species Habitat Models*), in coordination with the ongoing monitoring program being conducted for the Habitat Plan.

- **Action BUOW-1.** Acquire, through fee title purchase or conservation easement, parcels with documented burrowing owl nest sites.

Objective 6-2. Reduce the primary threat of habitat loss by protecting the habitat needed to meet this RCIS's conservation target for occupied nesting habitat (400 acres), potential nesting/overwintering (27,100 acres), and overwintering only (11,500 acres) habitat.

- **Action BUOW-2**. Acquire, through fee title purchase or conservation easement, parcels with occupied nesting habitat and potential nesting/overwintering habitat in the RCIS area outside of the Habitat Plan boundary.
- **Action BUOW-3**. Acquire, through fee title purchase or conservation easement, parcels with overwintering only habitat for burrowing owl.

Objective 6-3. Enhance burrowing owl habitat.

- **Action BUOW-4.** Use livestock grazing to create and maintain short-statured grasslands to encourage ground squirrel colonization to help support burrowing owl colonies.
- **Action BUOW-5.** Cease the use of rodenticides on protected lands, except where needed to retain structural integrity of infrastructure (e.g., earthen dams), particularly in grasslands, to maintain a prey base and a source of burrows for burrowing owls.
- **Action BUOW-6.** Coordinate with the wildlife agencies to explore the feasibility of establishing artificial burrows or other means to promote breeding.

- **Action BUOW-7**. Contribute to the annual monitoring program for burrowing owls inside of the Habitat Plan's plan area and implement a monitoring program outside of the Habitat Plan's plan area.

Objective 6-4: Work with private and public landowners to conduct land management practices in a way that will benefit burrowing owls.

- **Action BUOW-8.** Work with private and public landowners to develop land management strategies to improve habitat for burrowing owls, such as limited California ground squirrel control.
- **Action BUOW-9.** Work with land managers of potentially suitable breeding habitat to pilot land management practices designed to attract overwintering owls to utilize these areas for breeding.
- ***Action BUOW-10.*** Seek additional funding to support research.

3.6.6.2 Conservation Priorities

- Prioritize protection of known or newly discovered occurrences (ICF International 2012).
- Protect and enhance occupied breeding habitat (ICF International 2012) and protect and enhance habitat on and adjacent to areas known to have been occupied (Figure H-6, Appendix H). This includes the following historic nesting sites.
  - Upper Coyote Creek CPU (Henry W. Coe State Park).
  - Arroyo Valle CPU.
  - Arroyo Mocho CPU.
  - Arroyo Hondo CPU.
- Prioritize protection and enhance actions within 1.0 mile of documented burrowing owl occurrences (Klute et al. 2003, ICF International 2012).
- Provide funding to support an annual monitoring program for burrowing owl to monitor occupied burrowing owl habitat, monitor burrowing owl populations, and to estimate the population target needed for burrowing owls to persist in the RCIS area (Klute et al. 2003, ICF International 2012).

3.6.6.3 Opportunities for Adaptation to Climate Change

Gardali et al. (2012) ranked the climate vulnerability of 358 California bird species, as described in Section 3.6.5.3, *Opportunities for Adaptation to Climate Change*. Burrowing owl was given a score of 21 and was not considered an immediate conservation priority due to a relatively low Climate Vulnerability Score (Table 3-5).

Table 3-5. Climate Vulnerability Scoring for Burrowing Owl as Described in Gardali et al. (2012)[a]

Criteria	Score[b, c]
Exposure	
Habitat suitability	1 – low; habitat suitability is expected to increase or decrease by 0–10%
Food availability	1 - low; food availability for taxon would be unchanged or increase
Extreme weather	1 – low; there is no evidence that a taxon would be exposed to more frequent or severe extreme weather events
Sensitivity	
Habitat specialization	3 – high; taxon uses only specific habitat types or elements
Physiological tolerance	1 – low; minimal or no evidence of physiological sensitivity to climatic conditions
Migratory status	2 - moderate; short-distance migrants (movements primarily restricted to the nearctic zone)
Dispersal ability	1 – low; taxon with high dispersal ability

Notes:

[a] Additional information about species scoring, including the database of scores is located here: http://data.prbo.org/apps/bssc/index.php?page=climate-change-vulnerability.

[b] Scores range from 1 – 3; generally low, medium, and high.

[c] Climate vulnerability score = Sum of exposure score X Sum of sensitivity score.

Despite the assessment that burrowing owl may not be among the most vulnerable bird species to climate change, the species is already in steep decline in the RCIS area (Santa Clara Valley Habitat Agency 2017), where they currently use urban habitats for breeding. Those areas will not likely be affected by climate change, provided habitat management continues. According to habitat suitability models under current and future conditions, the probability of burrowing owl occurrence in the RCIS area may increase over time, particularly in the Santa Clara Valley (Point Blue Conservation Science 2017).

By focusing on protection of known nesting locations and expansion of protections and management of foraging habitat surrounding those nesting locations, the conservation strategy aims to provide suitable nesting habitat in locations where this species is known to occur. By expanding protections to new areas, it builds redundancy into the available nesting locations in the region so that if historic nest locations are no longer viable due to the effects from climate change, individual owls can disperse to new locations. The greatest risk from climate change likely comes from the potential for an increase in frequency and intensity of wildfires in the grassland habitats in Santa Clara Valley and the Diablo Range. Burrowing owls primarily use these habitats in the winter, when fire risk is low, but an increase in fires could temporarily reduce wintering habitat quality in the years following the fire. Over the long term, fire in grasslands may result in a net benefit in habitat quality by maintaining grasslands and reducing dense thatch.

3.6.7 Swainson's Hawk

3.6.7.1 Conservation Goals and Objectives

Goal 7. Increase the number of Swainson's hawk nesting pairs in the RCIS area.

Objective 7-1. Protect known Swainson's hawk nesting trees.

- **Action SWHA-1.** Conduct annual surveys of nesting habitat to locate new nest locations and monitor the status of known nest sites to identify areas for habitat protection, enhancement, and restoration.
- **Action SWHA-2.** Protect active and recently active (i.e., within prior 5 years) nest trees through incentives and cooperation with landowners and CDFW.

Objective 7-2. Reduce the primary threats of habitat loss by protecting habitat needed to meet this RCIS's conservation target for nesting (1,000 acres) and foraging (12,000 acres) habitat (Figure H-7, Appendix H, *Focal Species Habitat Models*).

- **Action SWHA-3.** Acquire unprotected habitat nesting and foraging habitat.

Objective 7-3. Enhance Swainson's hawk foraging and nesting habitat.

- **Action SWHA-4.** Cease any use of rodenticides on protected lands, except where needed to retain structural integrity of infrastructure (e.g., earthen dams), to enhance prey populations for Swainson's hawk.
- **Action SWHA-5.** Plant nest trees within suitable foraging habitat that Swainson's hawks can use in the future.

Objective 7-4: Work with private and public landowners to conduct land management practices in a way that will benefit Swainson's hawk.

- **Action SWHA-6.** Work with owners of working lands to develop land management strategies to enhance and increase foraging and nesting habitat for Swainson's hawk, including cropping patterns on agricultural lands beneficial to Swainson's hawks (e.g., alfalfa).
- **Action SWHA-7.** Incentivize (e.g., through Safe Harbor Agreements) private landowners to promote land management practices that will improve Swainson's hawk breeding habitat and maintain foraging habitat.

3.6.7.2 Conservation Priorities

- Assess the condition of nesting and foraging habitat within 1 mile of active and recently active nest sites (ICF 2018), including the nest site in Lower Coyote Creek-Frontal San Francisco Bay Estuaries CPU.
- Prioritize suitable habitat within 1 mile (ICF 2018) of nest sites for protection and enhancement. The occurrence is located along Coyote Creek in the Lower Coyote Creek–Frontal San Francisco Bay Estuaries CPU, just south of Bailey Road (Figure H-7, Appendix H).

3.6.7.3 Opportunities for Adaptation to Climate Change

Gardali et al. (2012) ranked the climate vulnerability of 358 California bird species (Climate Vulnerability Assessment), as described in Section 3.6.5.3, *Opportunities for Adaptation to Climate Change*. Swainson's hawk was given a score of 42 and moderate climate priority in the Climate Vulnerability Assessment (Gardali et al. 2012) and was therefore considered a priority with respect to climate vulnerability (Table 3-6). Swainson's hawk is vulnerable to the effects of climate change due to an expected loss of nesting habitat in the Central Valley, loss of foraging habitat to urban development and to conversion to unsuitable agricultural practices, and a potential increase in exposure to extreme weather events because it is a long-distance migrant.

Table 3-6. Climate Vulnerability Scoring for Swainson's Hawk as Described in Gardali et al. (2012)[a]

Criteria	Score[b, c]
Exposure	
Habitat suitability	3 – high; habitat suitability is expected to decrease by >50%
Food availability	1 - low; food availability for taxon would be unchanged or increase
Extreme weather	2 – moderate; taxon is expected to be exposed to some increase in extreme weather events
Sensitivity	
Habitat specialization	2 – moderate; taxon that tolerates some variability in habitat type or element
Physiological tolerance	1 – low; minimal or no evidence of physiological sensitivity to climatic conditions
Migratory status	3 - high; long-distance migrants (migrates at least to the neotropics)
Dispersal ability	1 – low; taxon with high dispersal ability

Notes:

[a] Additional information about species scoring, including the database of scores is located here: http://data.prbo.org/apps/bssc/index.php?page=climate-change-vulnerability

[b] Scores range from 1 – 3; generally low, medium, and high

[c] Climate vulnerability score = Sum of exposure score X Sum of sensitivity score

In the RCIS area, Swainson's hawk is known to nest in a single location in the Coyote Valley (Section 2.2.5.3, *Focal Species Profiles, Swainson's Hawk*). There are ample opportunities for the species to expand its nesting range within the RCIS area (Figure H-7, Appendix H), particularly if crop types are planted that provide suitable foraging habitat. Additional protection, restoration, and management of riparian nesting habitat will retain, if not increase those opportunities. The primary threat to Swainson's hawk in the RCIS area from climate change could be a decrease in water availability for agricultural uses in Santa Clara Valley. Swainson's hawk relies on agricultural areas as foraging habitat. With a decrease in water availability, and a potential decrease in the profitability of some crop types (e.g., alfalfa) agricultural practices and land uses may change. Foraging habitat is already limited, so further loss would make nesting much less viable. Actions in the conservation strategy focused on working with private owners of working lands, including creating incentive programs to encourage planting of good forage crops, will offset these effects.

3.6.8 San Joaquin Kit Fox

3.6.8.1 Conservation Goals and Objectives

Goal 8. Protect and enhance San Joaquin kit fox habitat and important regional linkages for the species in the RCIS area.

Objective 8-1. Reduce the threat of habitat loss by protecting suitable movement and foraging habitat in the southeastern and northeastern portion of the RCIS area (Figure H-8, Appendix H, *Focal Species Habitat Models*) to achieve this RCIS's conservation target for movement and foraging habitat (20,100 acres) and low-use habitat (300 acres).

- **Action SJKF-1.** Conduct movement studies of San Joaquin kit fox to identify key areas to protect to improve landscape connectivity.
- **Action SJKF-2.** Acquire San Joaquin kit fox movement and foraging habitat to improve connectivity, as informed by results of movement studies (when available).

Objective 8-2. Increase the connectivity of suitable habitat (Figure 2-22b) at areas likely to be important landscape linkages for San Joaquin kit fox.

- **Action SJKF-3**. Enhance existing landscape linkages for San Joaquin kit fox and other medium-sized and large mammals within movement and foraging habitat.
- **Action SJKF-4**. Create new crossings for San Joaquin kit fox and other wildlife at key locations across SR 152 and other roads or features identified as barriers to this species.
- **Action SJKF-5.** Conduct targeted studies to evaluate San Joaquin kit fox movement in eastern Santa Clara County to identify potential movement corridors between the RCIS area and the Central Valley populations to inform future land protection, restoration, management, and connectivity projects.

Objective 8-3. Enhance San Joaquin kit fox habitat.

- **Action SJKF-6.** Use livestock grazing to maintain short-statured grasslands and encourage colonization by California ground squirrel, which are a primary prey for San Joaquin kit fox.
- **Action SJKF-7.** Cease any use of rodenticides on protected lands, except where needed to retain structural integrity of infrastructure (e.g., earthen dams), to enhance the conservation and expansion of California ground squirrel colonies.
- **Action SJKF-8.** Assess the status of non-native red fox, and control populations, as necessary, to reduce negative effects of competition by red foxes on San Joaquin kit fox (U.S. Fish and Wildlife 2010b).

Objective 8-4. Work with private and public landowners to conduct land management practices to benefit San Joaquin kit fox.

- **Action SJFK-9.** Work with owners of working lands to develop land management strategies to benefit San Joaquin kit fox.
- **Action SJFK-10.** Incentivize (e.g., through Safe Harbor Agreements) private landowners to promote land management practices that will improve San Joaquin kit fox habitat.

3.6.8.2 Conservation Priorities

- Identify and modify barriers to movement, particularly across four-lane highways with median barriers (U.S. Fish and Wildlife Service 2010b), to increase permeability between Central Valley populations and San Joaquin kit fox habitat in the Pacheco Creek, Arroyo Mocho, and Arroyo Valle CPUs where this species occurs (U.S. Fish and Wildlife Service 2010b, ICF International 2012) (Section 2.4.5., *Loss of Habitat Connectivity*, Figure H-8, Appendix H).
- Educate landowners in southeastern Santa Clara County on land management actions that could enhance grassland habitat and allow for wildlife movement across the landscape (ICF International 2012).
- Implement conservation priorities for San Joaquin kit fox that are consistent with the actions prioritized for those identified under Section 3.7.1, *Habitat Connectivity and Landscape Linkage*.

3.6.8.3 Opportunities for Adaptation to Climate Change

Stewart et al. (2016) found San Joaquin kit fox to be moderately or less vulnerable to climate change by analyzing 27 climate change vulnerability criteria (e.g., natural history, habitat requirements, physiology, interactions with other species). Although up to 74% of current occurrence locations are projected to become climatically unsuitable by 2070-2099, there is an expected increase in suitable habitat within observed dispersal distance across the range by between approximately 13% and 33% (Stewart et al. 2016). San Joaquin kit fox may also benefit from an upslope expansion of habitat into nearby foothills, provided other ecological factors align (e.g., interactions with predators, prey availability).

In the RCIS area, suitable habitat for San Joaquin kit fox is expected to increase under all four climate scenarios analyzed, with a significant increase under three of those scenarios (Stewart et al. 2016). Baseline habitat models in Stewart et al. (2016) show little or no habitat currently available for San Joaquin kit fox in the RCIS area. Areas of newly suitable habitat will be widely distributed across the eastern and southern parts of the RCIS area. In the one climate change scenario projecting limited expansion of San Joaquin kit fox habitat in the RCIS area, there is still newly suitable habitat in the southeastern corner of Santa Clara County. The conservation strategy for this species focuses primarily on the southeastern corner of Santa Clara County, with an emphasis on improving habitat connectivity across the landscape. Implementing these actions would help San Joaquin kit fox disperse into the RCIS area in the future.

3.6.9 Mountain Lion

3.6.9.1 Conservation Goals and Objectives

Goal 9. Improve habitat connectivity and facilitate the persistence of mountain lion populations in the RCIS area.

Objective 9-1. Improve habitat connectivity for mountain lion to promote dispersal and gene flow to maintain populations (Figure 2-22b and Figure H-9, Appendix H, *Focal Species Habitat Models*).

- **Action ML-1.** Acquire unprotected land featuring habitat that is suitable for mountain lion, with an emphasis on habitat that is adjacent to suitable, protected mountain lion habitat or that is otherwise important for wildlife connectivity for the species. In the Santa Cruz Mountains, focus protection in predicted core areas and corridors (Wilmers et al. 2013) (Figure H-9, Appendix H).
- **Action ML-2.** Modify barriers to mountain lion movement by installing new crossings or repairing known or potential existing mountain lion crossings to increase permeability.
- **Action ML-3.** Conduct targeted studies to track mountain lion movement patterns and habitat use, particularly around movement pinch points; identify priority habitat to protect; and identify barriers to modify to improve landscape connectivity.
- **Action ML-4.** Improve vegetation cover in key linkage areas where lack of cover reduces the areas' suitability for wildlife passage.
- **Action ML-5.** Improve use of safe wildlife passage structures with directional fencing and maintenance of existing culverts.

Objective 9-2. Implement a public outreach campaign to inform the public about mountain lions in areas where mountain lion encounters are likely to occur, to reduce the incidence of human-wildlife conflicts that negatively impact landowners and mountain lions.

- **Action ML-6.** Work with private landowners to discourage harming mountain lion, and to implement management practices that reduce negative mountain lion-livestock interactions.
- **Action ML-7.** Conduct public outreach to improve public awareness of mountain lion, particularly in urban areas adjacent to natural lands.

3.6.9.2 Conservation Priorities

Use the best available scientific information to identify landscape linkages, including the *Critical Linkages Bay Area & Beyond* (Penrod et. al 2013), *Santa Clara Valley Habitat Plan* (ICF International 2012), *Coyote Valley Landscape Linkage Report* (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017) and Wilmers et al. (2017) as a guiding documents (Section 2.3.1, *Habitat Connectivity*, Section 2.4.5., *Loss of Habitat Connectivity*).

Actions should be prioritized to enhance wildlife permeability across SR 17, U.S. Highway 101 (U.S. 101), Monterey Highway, SR 25, and SR 152 (Figure 2-22b) to maintain or increase genetic diversity in mountain lion populations, particularly those surrounded by urbanization (Gustafson et al. 2019). One crossing location in each linkage area will not suffice, but a series of complementary crossings across multiple barriers and for multiple species are needed to ensure connectivity for mountain lion and other species. Existing crossing infrastructure should be prioritized in conjunction with local planners and biologists (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017). Specific areas where infrastructure could be modified to improve permeability for mountain lion and other native large mammals include, but are not limited to, the following locations.

- U.S. 101: Metcalf Bridge overpass.

- U.S. 101: Culvert at California Department of Transportation (Caltrans) post miles 20.98, 23.3, 23.7, 24.0, and 24.27 (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017).
- U.S. 101 and Monterey Highway: at/near Bailey Road intersection.
- Monterey Highway: Fisher Creek and Monterey Highway Culvert (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017).
- U.S. 101: Coyote Creek riparian corridor (Lower Coyote Creek-Frontal San Francisco Estuary CPU).
- U.S. 101: at SR 25.
- SR 152: west of San Luis Reservoir connecting across SR 152 at the CDFW Cottonwood Creek Wildlife Area.
- SR 152: between Gilroy and Casa de Fruta.
- SR 17: just north of Lexington Reservoir (Wilmers et al. 2013).

New overpasses and/or underpasses designed for wildlife crossing are also needed to improve permeability in linkage areas. Crossing infrastructure should prioritized in conjunction with local planners and biologists. Locations identified include the following (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017).

- Monterey Highway: Tulare Hill.
- Monterey Highway: Blanchard Road.
- Monterey Highway: Emado.
- Monterey Highway: Mid-valley.
- Santa Teresa Blvd: Tulare Hill.

The conservation priorities described in Section 3.71, *Habitat Connectivity and Landscape Linkage*, are also relevant to mountain lion and can be used to improve landscape connectivity for mountain lion.

3.6.9.3 Opportunities for Adaptation to Climate Change

There is limited research available on the climate change vulnerability of mountain lion, though there is much research on other highly mobile mammal species (e.g., Stewart et al. 2016). Because mountain lions are highly mobile, they have the ability to move into suitable habitat and away from pressures within a generation. If habitat quality or prey base changes due to the effects of climate change, they have the ability to move into suitable habitat. This adaptability makes them less vulnerable to climate change. They also occupy all land cover types in the RCIS area, so even if vegetation types shift under climate scenarios, habitat in the RCIS area may remain suitable. The conservation strategy is focused on increasing permeability across the landscape to facilitate dispersal to available habitat, should pressures force them out of their current ranges. This, coupled with the protection and management of more habitat in the RCIS area will ensure that mountain lion persists in the RCIS area.

3.6.10 Congdon's Spikeweed

3.6.10.1 Conservation Goals and Objectives

Goal 10. Increase the distribution and abundance of Congdon's spikeweed in the RCIS area.

Objective 10-1. Protect the three known occurrences of Congdon's spikeweed (Figure H-10, Appendix H, *Focal Species Habitat Models*) and the habitat needed to meet this RCIS's conservation target (400 acres) (Figure H-10, Appendix H, *Focal Species Habitat Models*).

- **Action CSPW-1.** Reduce the loss of Congdon's spikeweed occurrences by protecting occurrences and suitable habitat.
- **Action CSPW-2.** Establish an incentive program for private landowners to protect Congdon's spikeweed occurrences and manage habitat.
- **Action CSPW-3.** Survey suitable habitat to locate undocumented occurrences of Congdon's spikeweed.

Objective 10-2. Enhance Congdon's spikeweed habitat.

- **Action CSPW-4.** Survey potentially suitable habitat to identify locations where the habitat can be enhanced or restored to allow for population expansion.
- **Action CSPW-5.** Control invasive plants in occupied habitat.

Objective 10-3. Restore or create occurrences of Congdon's spikeweed.

- **Action CSPW-6**. Use pilot projects to restore and/or establish new occurrences through translocation onto protected habitat (Section 3.2.2.2, *Transplanting Plants to Create New Populations*).
- **Action CSPW-7.** Restore occupied habitat and suitable but unoccupied habitat for Congdon's spikeweed.
- **Action CSPW-8**. Store and maintain seeds from natural occurrences at a Center for Plant Conservation certified botanic garden.

3.6.10.2 Conservation Priorities

Prioritize the protection of occurrences of Congdon's spikeweed and suitable habitat. All known occurrences and suitable habitat are located north of SR 237 and west of Interstate 680, primarily within the San Francisco Bay, Saratoga Creek–Frontal San Francisco Bay Estuaries, and Guadalupe River–Frontal San Francisco Bay Estuaries CPUs (Figure H-10, Appendix H). At present, the only documented occurrences of this species in the RCIS area are in relatively urban locations (California Department of Fish and Wildlife, California Natural Diversity Database 2019). Therefore, protection and management of existing occurrences and Congdon's spikeweed habitat (ICF International 2010) should be prioritized in the following locations because of their large size and relative intactness.

- Sunnyvale Baylands Park.
- San José –Santa Clara Regional Wastewater Treatment Facility Bufferlands.

- Survey suitable habitat to locate new occurrences for protection and enhancement.

3.6.10.3 Opportunities for Adaptation to Climate Change

Like all organisms, plants need to be able to move away from stress caused by climate change into areas that are either still suitable or newly suitable under changed climate conditions. In general, the predicted consequence of climate change will result in shifts of suitable habitat to higher elevations and latitudes (Jump and Penuelas 2005). If climate change causes current habitat to become unsuitable, populations it will have to either 1) complete likely multi-generational movement to suitable habitat, 2) face genetic change in place to cope with the new conditions, or 3) go extinct. If the climate changes more rapidly than either 1 or #2, then extinction will be inevitable (Thomas et al. 2004). Under climatic changes, temperature and water availability are the two variables most often documented as influencing either genetic change or physical movement (summarized in Jump and Penuelas 2005).

Phenotypic plasticity and a species' or population's ability to move influence how individual species or populations are affected by changing conditions under a different climate. Phenotypic plasticity can accommodate short-term changes and potentially lead to long-term genetic change, but if changes are drastic, the ability of plasticity to accommodate the change will reach its limit and dispersal will be necessary (Murren et al. 2015). The ability to move is influenced by dispersal methods (e.g., whether dispersal can occur fast enough to outpace threats) and barriers, either natural barriers (e.g., ecotones, change in soil type) or human-made barriers (e.g., developed landscapes). This conservation strategy facilitates adaptation to climate change by recommending actions that facilitate dispersal across the landscape, and assisted migration (e.g., creating new occurrences).

Anacker et al. (2013) conducted a climate vulnerably assessment of 156 plant species in California. They determined that Congdon's spikeweed is highly vulnerable to climate change due primarily to anthropogenic barriers to movement and land use changes (e.g., geothermal and wind energy production sites). Congdon's spikeweed is restricted to habitats with alkaline or saline soils and is typically found near aquatic habitat. This species is adapted to disturbance and can survive in a variety of natural and seminatural habitats with these soil types, including tidal salt marshes, valley and foothill grasslands, agricultural lands, and golf courses. However, because alkaline and saline soils (and thus species occurrences) are mainly restricted to the remnant marshlands in the RCIS area, and much of this habitat has been lost due to development, there is little nearby habitat for populations of Congdon's spikeweed to disperse to. In addition, because the occurrences of Congdon's spikeweed are in low-lying areas near San Francisco Bay, this species could be impacted by sea-level rise as a result of climate change. Therefore, the focus on protecting extant occurrences of this species, coupled with the intent to protect large blocks of suitable habitat adjacent to those occurrences will provide opportunities for the species to disperse to lands that are protected and being managed for ecological purposes. Further, the focus of this RCIS' conservation strategy on invasive plant management, an issue that could be exacerbated by climate change (e.g., new conditions could favor invasive plants more than native plants), will help to maintain the suitability of existing habitat. Where barriers limit dispersal from current locations, translocation (i.e., assisted migration) methods may be used to ensure the persistence of the Congdon's spikeweed in the RCIS area.

3.6.11 Mount Hamilton Thistle

3.6.11.1 Conservation Goals and Objectives

Goal 11. Increase the distribution and abundance of Mount Hamilton thistle within the RCIS area.

Objective 11-1. Reduce the threat of habitat loss by protecting the habitat needed to meet this RCIS's conservation target for occupied habitat (50 acres) and unprotected suitable habitat (100 acres) for Mount Hamilton thistle (Figure H-11, Appendix H, *Focal Species Habitat Models*).

- **Action MTHT-1.** Acquire, through fee title purchase or conservation easement, land with occurrences of Mount Hamilton thistle or land with suitable habitat in areas near occurrences.
- **Action MTHT-2**. Survey habitat to identify unrecorded occurrences of Mount Hamilton thistle to inform future land protection.

Objective 11-2. Enhance Mount Hamilton thistle habitat.

- **Action MTHT-3.** Conduct research on Mount Hamilton thistle, in coordination with species experts, land managers, universities, and the regulatory agencies, to inform management.
- **Action MTHT-4**. Conduct invasive species removal in suitable habitat, and address other stresses or threats, as determined by research.
- **Action MTHT-5.** Maintain and enhance the hydrological systems (e.g., streams, springs, ponds) which support or have the potential to support Mount Hamilton thistle.

Objective 11-3. Restore and/or create occurrences of Mount Hamilton thistle.

- **Action MTHT-6.** Use pilot projects to restore and/or establish new occurrences through translocation onto protected habitat (Section 3.2.2.2, *Transplanting Plants to Create New Populations*).
- **Action MTHT-7.** Restore occupied habitat and suitable but unoccupied habitat for Mount Hamilton thistle.
- **Action MTHT-8.** Store and maintain seeds from natural occurrences at a Center for Plant Conservation certified botanic garden.

3.6.11.2 Conservation Priorities

- Prioritize protection of occurrences (ICF International 2012) (Figure H-11, Appendix H).
- Evaluate occurrences on protected lands for enhancement actions (U.S. Fish and Wildlife Service 1998a, ICF International 2012).
- Survey habitat to identify unrecorded occurrences of occurrences for protection and enhancement (Figure H-11, Appendix H).

3.6.11.3 Opportunities for Adaptation to Climate Change

Like all organisms, plants need to be able to move away from stress caused by climate change into areas that are either still suitable or newly suitable under changed climate conditions. See Section 3.6.10.3, *Opportunities for Adaptation to Climate Change* for a brief summary of how plants can respond to the effects of climate change.

Anacker et al. (2013) conducted a climate vulnerably assessment of 156 plant species in California. They determined that Mount Hamilton thistle is highly vulnerable to climate change due primarily to anthropogenic barriers to movement, habitat availability, habitat restricted to uncommon geological features, and changes in disturbance regimes (e.g., seasonal flooding). Mount Hamilton thistle is endemic to serpentine soils, which have a limited distribution in the RCIS area. Remnant serpentine habitat is surrounded by large expanses of intensive urban development and is threatened by further development. This species also grows in seeps and springs and along intermittent and perennial streams, which are often dependent on seasonal flooding. As precipitation patterns change, with wetter winters and hotter, drier summers, extreme flood events and lack of water availability in the summer could severely reduce habitat suitability. Without a year-round water source, currently occupied habitat may become unsuitable.

This RCIS provides a conservation strategy to protect and manage populations on the largest possible blocks of serpentine habitat (U.S. Fish and Wildlife Service 1998a) and to maintain and enhance the hydrologic systems upon which this species relies to help ensure the long-term survival of this species. This will help to ensure the persistence of populations and ensure that they have the ability to shift their distribution into suitable habitat in response to climate change. Further, the focus of this RCIS' conservation strategy on invasive plant management, an issue that could be exacerbated by climate change (e.g., new conditions could favor pest plants more than native plants), will help to maintain the suitability of existing habitat. Where barriers limit dispersal from current locations, translocation (i.e., assisted migration) methods may be used to ensure the persistence of Mount Hamilton thistle.

3.6.12 Tracy's Eriastrum and Rock Sanicle

3.6.12.1 Conservation Goals and Objectives

Goal 12. Increase the distribution and abundance of Tracy's eriastrum and rock sanicle within the RCIS area.

Objective 12-1. Protect occurrences of Tracy's eriastrum and occurrence of rock sanicle (Figure H-12, Appendix H, *Focal Species Habitat Models*), and any newly discovered occurrences.

- **Action TE&RS-1**. Acquire parcels with occurrences of Tracy's eriastrum and/or rock sanicle through fee title purchase or conservation easement.
- **Action TE&RS-2**. Survey habitat to identify unrecorded occurrences of Tracy's eriastrum and rock sanicle, with a focus on the Arroyo Valle, Arroyo Hondo, and Upper Coyote Creek CPUs, where all occurrences are found.

Objective 12-2. Enhance rock sanicle occurrences and habitat.

- **Action TE&RS-3.** Conduct research on Tracy's eriastrum and rock sanicle, in coordination with species experts, land managers, universities, and the regulatory agencies to inform management to benefit these species.
- **Action TE&RS-4.** Conduct invasive species removal in suitable habitat and address other factors that influence demographic performance and population growth, as determined by research.

Objective 12-3. Restore and/or create occurrences of Tracy's eriastrum and rock sanicle.

- **Action TE&RS-5**. Use pilot projects to restore and/or establish new occurrences through translocation onto protected habitat (Section 3.2.2.2, *Transplanting Plants to Create New Populations*).
- **Action TE&RS-6.** Restore habitat for Tracy's eriastrum and rock sanicle.
- **Action TE&RS-7.** Store and maintain seeds from natural occurrences at a Center for Plant Conservation certified botanic garden.

3.6.12.2 Conservation Priorities

- All known occurrences of Tracy's eriastrum and rock sanicle in the RCIS area are located in the Arroyo Valle, Arroyo Hondo, and Upper Coyote Creek CPUs (Figure H-12, Appendix H, *Focal Species Habitat Models*); therefore, all known occurrences and any new occurrences found in these CPUs should be prioritized for protection and enhancement.
- Evaluate occurrences on protected lands for enhancement actions (ICF International 2012).
- Survey habitat to identify unrecorded occurrences for protection and enhancement.

3.6.12.3 Opportunities for Adaptation to Climate Change

Like all organisms, plants need to be able to move away from stress caused by climate change into areas that are either still suitable or newly suitable under changed climate conditions. See Section 3.6.10.3, *Opportunities for Adaptation to Climate Change* for a brief summary of how plants can respond to the effects of climate change.

While little information is available on the vulnerability of Tracy's eriastrum and rock sanicle to climate change, it is assumed based on the climate vulnerability analysis for other species with similar stressors, that these species are moderately vulnerable to climate change due to anthropogenic barriers to movement into newly suitable habitat. Tracy's eriastrum and rock sanicle occur in open, rocky areas typically composed of shale or alluvium in common vegetation communities. Under hotter, drier conditions, suitable habitat may shift to different aspects or elevations. Populations of these species may be limited in their ability to disperse to newly suitable areas because of anthropogenic barriers to movement, such as roads or development. Therefore, the focus on protecting occurrences, coupled with the intent to protect large blocks of suitable habitat in adjacent to those occurrences will provide opportunities for the species to disperse to lands that are protected and being managed for ecological purposes. Further, the focus of this RCIS' conservation strategy on invasive plant management, an issue that could be exacerbated by climate change (e.g., new conditions could favor invasive plants more than native plants), will help to maintain the suitability of existing habitat. Where barriers limit dispersal from current locations, translocation (i.e., assisted migration) methods may be used to ensure the persistence of the Tracy's eriastrum and rock sanicle in the RCIS area.

3.6.13 Fragrant Fritillary

3.6.13.1 Conservation Goals and Objectives

Goal 13. Increase the distribution and abundance of fragrant fritillary in the RCIS area.

Objective 13-1. Protect newly discovered occurrences of fragrant fritillary.

- **Action FF-1.** Acquire parcels with occurrences of fragrant fritillary and/or suitable habitat adjacent to populations through fee title purchase or conservation easement.
- **Action FF-2.** Survey habitat to identify unrecorded occurrences of fragrant fritillary with an emphasis on surveying parcels adjacent to known occurrences.

Objective 13-2. Protect the habitat (Figure H-13, Appendix H, *Focal Species Habitat Models*) needed to meet this RCIS's conservation target for primary habitat (3,200 acres) and secondary habitat (26,000 acres).

- **Action FF-3.** Acquire unprotected fragrant fritillary habitat.

Objective 13-3. Enhance fragrant fritillary occurrences and habitat.

- **Action FF-4**. Use livestock grazing in a variety of regimes with the appropriate timing and intensity for fragrant fritillary.
- **Action FF-5**. Conduct research on fragrant fritillary, in coordination with species experts, land managers, universities, and the regulatory agencies, to inform management.
- **Action FF-6.** Conduct invasive species removal in suitable habitat through hand pulling, mowing, or mechanical removal.
- **Action FF-7.** Conduct prescribed burns, where feasible. Use pilot projects to inform location and frequency. In suitable habitat where prescribed burns are not feasible, conduct alternative vegetation treatments.

Objective 13-4. Restore and/or create occurrences of fragrant fritillary.

- **Action FF-8**. Use pilot projects to restore and/or establish new occurrences through translocation onto protected habitat (Section 3.2.2.2, *Transplanting Plants to Create New Populations*).
- **Action FF-9.** Restore occupied habitat and suitable but unoccupied habitat for fragrant fritillary.
- **Action FF-10**. Store and maintain seeds from natural occurrences at a Center for Plant Conservation certified botanic garden.

3.6.13.2 Conservation Priorities

- Prioritize protection of occurrences (ICF International 2012).

- Evaluate occurrences on protected lands for enhancement actions (U.S. Fish and Wildlife Service 1998a, ICF International 2012).
- Survey primary and secondary habitat to identify unrecorded occurrences for protection and enhancement (Figure H-13, Appendix H).

3.6.13.3 Opportunities for Adaptation to Climate Change

Like all organisms, plants need to be able to move away from stress caused by climate change into areas that are either still suitable or newly suitable under changed climate conditions. See Section 3.6.10.3, *Opportunities for Adaptation to Climate Change* for a brief summary of how plants can respond to the effects of climate change.

Anacker et al. (2013) conducted a climate vulnerably assessment of 156 plant species in California. They determined that fragrant fritillary is moderately vulnerable to climate change due primarily to anthropogenic barriers to movement. The entire range of fragrant fritillary is surrounded by areas of high-density urban development. Continuous development is a major threat to this species; especially since the future range is predicted to stay in the same general area, but contract. The focus on protecting occurrences of this species, coupled with the intent to protect large blocks of suitable habitat adjacent to those occurrences will provide opportunities for the species to disperse to lands that are protected and being managed for ecological purposes. In some locations, sea-level rise is a threat to fragrant fritillary, but populations in the RCIS area are at higher elevations and not likely to be affected by rising sea-levels. Further, the focus of this RCIS' conservation strategy on invasive plant management, an issue that could be exacerbated by climate change (e.g., new conditions could favor pest plants more than native plants), will help to maintain the suitability of existing habitat. Where barriers limit dispersal from current locations, translocation (i.e., assisted migration) methods may be used to ensure the persistence of fragrant fritillary.

3.6.14 Loma Prieta Hoita

3.6.14.1 Conservation Goals and Objectives

Goal 14. Increase the distribution and abundance of Loma Prieta hoita in the RCIS area.

Objective 14-1. Protect occurrences of Loma Prieta hoita (Figure H-14, Appendix H, *Focal Species Habitat Models*).

- **Action LPH-1.** Acquire parcels with occurrences of Loma Prieta hoita and suitable habitat adjacent to populations through fee title purchase or conservation easement.
- **Action LPH-2.** Survey habitat to identify unrecorded occurrences of Loma Prieta hoita, with an emphasis on parcels with occurrences or parcels adjacent to occurrences.

Objective 14-2. Protect the habitat needed to meet this RCIS's conservation target for primary habitat (6,400 acres) and secondary habitat (3,600 acres) (Figure H-14, Appendix H).

- **Action LPH-3.** Acquire unprotected Loma Prieta habitat.

Objective 14-3. Enhance Loma Prieta hoita occurrences and habitat.

- **Action LPH-4.** Maintain and enhance the hydrological systems (e.g., streams, springs, ponds) that support or have the potential to support Loma Prieta hoita.
- **Action LPH-5.** Conduct research on Loma Prieta hoita in coordination with species experts, land managers, universities, and the regulatory agencies to inform species management.
- **Action LPH-6.** Conduct invasive species removal in suitable habitat through hand pulling, mowing, or mechanical removal.

Objective 14-4. Restore and/or create occurrences of Loma Prieta hoita.

- **Action LPH-7.** Use pilot projects to restore and/or establish new occurrences through translocation onto protected habitat (Section 3.2.2.2, *Transplanting Plants to Create New Populations*).
- **Action LPH-8.** Restore habitat for Loma Prieta hoita.
- **Action LPH-9***.* Store and maintain seeds from natural occurrences at a Center for Plant Conservation certified botanic garden.

3.6.14.2 Conservation Priorities

- Prioritize protection of occurrences (ICF International 2012).
- Evaluate occurrences on protected lands for enhancement actions (ICF International 2012).
- Survey primary and secondary habitat to identify unrecorded occurrences for protection and enhancement (Figure H-14, Appendix H).

3.6.14.3 Opportunities for Adaptation to Climate Change

Like all organisms, plants need to be able to move away from stress caused by climate change into areas that are either still suitable or newly suitable under changed climate conditions. See Section 3.6.10.3, *Opportunities for Adaptation to Climate Change* for a brief summary of how plants can respond to the effects of climate change.

While little information is available on the vulnerability of Loma Prieta hoita to climate change, it is assumed, based on the climate vulnerability analysis for other species with similar stressors, that Loma Prieta hoita is highly vulnerable to climate change due primarily to anthropogenic barriers to movement into newly suitable habitat, habitat availability, and habitat restricted to uncommon geological features. Loma Prieta hoita is strongly associated with serpentine soils, which have a limited distribution in the RCIS area, but also occurs less commonly on other soil types. The remnant serpentine habitat in the RCIS area is surrounded by large expanses of intensive urban development and is threatened by further development. This species often grows in mesic habitats along drainage gullies, in riparian corridors dominated by oaks and California bay laurel, along springs, and along ephemeral and intermittent streams, which are often dependent on seasonal flooding. Although Loma Prieta hoita is not confined to these habitats, a large number of occurrences of Loma Prieta hoita occur on these habitats in the RCIS area. As precipitation patterns change, with wetter winters and hotter dryer summers, extreme flood events and reduced water availability in the summer could severely reduce habitat suitability. Therefore, the focus on protecting extant occurrences of this species, coupled with the intent to protect large blocks of suitable habitat adjacent to those occurrences will provide opportunities for the species to disperse to lands that are protected and being managed for ecological purposes. The focus of this RCIS' conservation strategy on invasive plant management, an issue that could be exacerbated by climate change (e.g., new conditions could favor pest plants more than native plants), will help to maintain the suitability of existing habitat. Where barriers limit dispersal from current locations, translocation (i.e., assisted migration) methods may be used to ensure the persistence of Loma Prieta hoita.

3.6.15 Smooth Lessingia

3.6.15.1 Conservation Goals and Objectives

Goal 15. Increase the distribution and abundance of smooth lessingia in the RCIS area.

Objective 15-1. Protect newly discovered occurrences of smooth lessingia.

- **Action SMLS-1.** Acquire parcels with occurrences of smooth lessingia and suitable habitat in areas near occurrences through fee title purchase or conservation easement.
- **Action SMLS-2.** Survey habitat to identify unrecorded occurrences of smooth lessingia, with an emphasis on parcels with known occurrences or parcels adjacent to known occurrences.

Objective 15-2. Protect the habitat needed to meet this RCIS's conservation target for habitat (3,200 acres) for smooth lessingia (Figure H-15, Appendix H, *Focal Species Habitat Models*).

- **Action SMLS-3.** Acquire unprotected smooth lessingia habitat.

Objective 15-3. Enhance smooth lessingia occurrences and habitat.

- **Action SMLS-4.** Use livestock grazing in a variety of regimes with the appropriate timing and intensity for smooth lessingia.
- **Action SMLS-5.** Conduct invasive species removal in suitable habitat.

Objective 15-4. Restore and/or create occurrences of smooth lessingia.

- **Action SMLS-6.** Restore and/or establish new occurrences through translocation onto protected habitat (Section 3.2.2.2, *Transplanting Plants to Create New Populations*).
- **Action SMLS-7.** Use pilot projects to restore occupied habitat and suitable but unoccupied habitat for smooth lessingia.
- **Action SMLS-8**. Store and maintain seeds from natural occurrences at a Center for Plant Conservation certified botanic garden.

3.6.15.2 Conservation Priorities

- Prioritize protection of occurrences (ICF International 2012).
- Evaluate occurrences on protected lands for enhancement actions (U.S. Fish and Wildlife Service 1998a, ICF International 2012).
- Survey suitable habitat to identify unrecorded occurrences for protection and enhancement (Figure H-15, Appendix H).

3.6.15.3 Opportunities for Adaptation to Climate Change

Like all organisms, plants need to be able to move away from stress caused by climate change into areas that are either still suitable or newly suitable under changed climate conditions. See Section 3.6.10.3, *Opportunities for Adaptation to Climate Change* for a brief summary of how plants can respond to the effects of climate change.

Anacker et al. (2013) conducted a climate vulnerably assessment of 156 plant species in California. They determined that smooth lessingia is highly vulnerable to climate change due primarily to anthropogenic barriers to movement, and habitat restricted to uncommon geological features. Smooth lessingia is endemic to serpentine soils which have a limited distribution in the RCIS area. This species is adapted to disturbance and often thrives on roadcuts where serpentine soils remain and the period of disturbance is limited and temporary. However, substantial disturbances (e.g., development, mining, recreational activities, improper grazing timing) can lead to population declines (U.S. Fish and Wildlife Service 1998a) and loss of habitat.

Large expanses of surrounding intensive urban development leave this species with little ability to shift its range in response to climate change. This RCIS provides a conservation strategy to protect and manage populations on the largest possible blocks of serpentine habitat, to help ensure the long-term survival of smooth lessingia (U.S. Fish and Wildlife Service 1998a). This will ensure the persistence of populations and ensure that they have the ability to shift their distribution into suitable but unoccupied habitat in response to climate change. Further, the focus of this RCIS' conservation strategy on invasive plant management, an issue that could be exacerbated by climate change (e.g., new conditions could favor pest plants more than native plants), will help to maintain the suitability of existing habitat. Where barriers limit dispersal from current locations, translocation (i.e., assisted migration) methods may be used to ensure the persistence of smooth lessingia.

3.6.16 Most Beautiful Jewelflower

3.6.16.1 Conservation Goals and Objectives

Goal 16. Increase the distribution and abundance of most beautiful jewelflower in the RCIS area.

Objective 16-1. Protect occurrences of most beautiful jewelflower.

- **Action MBJ-1.** Acquire parcels with occurrences of most beautiful jewelflower and suitable habitat adjacent to known occurrences through fee title purchase or conservation easement.
- **Action MBJ-2.** Survey habitat to identify unrecorded occurrences of most beautiful jewelflower, with an emphasis on parcels with known occurrences or parcels adjacent to known occurrences.

Objective 16-2. Protect habitat needed to meet the conservation target for primary habitat (6,400 acres) and secondary habitat (600 acres) (Figure H-16, Appendix H, *Focal Species Habitat Models*).

- **Action MBJ-3**. Acquire unprotected most beautiful jewelflower habitat.

Objective 16-3. Enhance most beautiful jewelflower occurrences and habitat.

- **Action MBJ-4.** Use livestock grazing in a variety of regimes with the appropriate timing and intensity for most beautiful jewelflower.
- **Action MBJ-5.** Conduct invasive species removal in suitable habitat for most beautiful jewelflower.
- **Action MBJ-6.** Conduct pilot projects to determine the effect of prescribed burns on most beautiful jewelflower in coordination with scientific advisors, land managers, universities, and the regulatory agencies to inform location and frequency of potential burn areas for most beautiful jewelflower.

Objective 16-4. Restore and/or create occurrences of most beautiful jewelflower.

- **Action MBJ-7.** Restore and/or establish new occurrences through translocation onto protected habitat (Section 3.2.2.2, *Transplanting Plants to Create New Populations*).
- **Action MBJ-8.** Restore occupied habitat and suitable but unoccupied habitat for most beautiful jewelflower.
- **Action MBJ-9**. Store and maintain seeds from natural occurrences in the RCIS area at a Center for Plant Conservation certified botanic garden.

3.6.16.2 Conservation Priorities

- Prioritize protection of occurrences (ICF International 2012).
- Evaluate occurrences on protected lands for enhancement actions (USFWS 1998, ICF International 2012).
- Survey primary and secondary habitat to identify unrecorded occurrences for protection and enhancement (Figure H-16, Appendix H).

3.6.16.3 Opportunities for Adaptation to Climate Change

Like all organisms, plants need to be able to move away from stress caused by climate change into areas that are either still suitable or newly suitable under changed climate conditions. See Section 3.6.10.3, *Opportunities for Adaptation to Climate Change* for a brief summary of how plants can respond to the effects of climate change.

Anacker et al. (2013) conducted a climate vulnerably assessment of 156 plant species in California. They determined that most beautiful jewelflower is highly vulnerable to climate change due primarily to anthropogenic barriers to movement, predicted impact of land use changes in response to climate change (e.g., new energy production sites), and habitat restricted to uncommon geological features. Most beautiful jewelflower is endemic to serpentine soils which have a limited distribution in the RCIS area. This species is adapted to disturbance and can grow on roadcuts where serpentine soils remain and the period of disturbance is limited and temporary. However, substantial disturbances (e.g., development, mining, recreational activities, improper grazing timing) can lead to population declines (U.S. Fish and Wildlife Service 1998a) and loss of habitat.

Large expanses of surrounding intensive urban development leave this species with little ability to shift its range in response to climate change. This RCIS provides a conservation strategy to protect and manage populations on the largest possible blocks of serpentine habitat (U.S. Fish and Wildlife Service 1998a) to help ensure the long-term survival of this species. This will help to ensure the persistence of populations and provide access to new habitats in a changing climate. In some locations, sea-level rise is a threat to most beautiful jewelflower, but populations in the RCIS area are at higher elevations and not likely to be affected by rising sea-levels. Further, the focus of this RCIS' conservation strategy on invasive plant management, an issue that could be exacerbated by climate change (e.g., new conditions could favor pest plants more than native plants), will help to maintain the suitability of existing habitat. Where barriers limit dispersal from current locations, translocation (i.e., assisted migration) methods may be used to ensure the persistence of most beautiful jewelflower.

3.7 Conservation Strategy for Other Conservation Elements

The conservation strategy for the other conservation elements aims to protect and enhance unique land cover types and other ecological resources, as described in Chapter 2, *Environmental Setting*, Section 2.3, *Other Conservation Elements*. The conservation strategy focuses on the protection and persistence of these important ecological processes through land acquisition, enhancement, and public education. Conservation goals, objectives, actions, and priorities are discussed in this section.

3.7.1 Habitat Connectivity and Landscape Linkage

3.7.1.1 Conservation Goals and Objectives

Goal 17. Increase connectivity for native wildlife and plants across the landscape by protecting and improving the condition of natural and semi-natural lands and increasing the permeability of infrastructure.

Objective 17-1. Protect and/or enhance important landscape linkages for the focal species and other native species within and beyond the RCIS area.

- **Action HC-1.** Protect habitat for focal species and other species within the following Critical Linkage Designs (Penrod et al. 2013; Figure 2-22b) to maintain and enhance connectivity within and between landscapes.
    - Diablo Range-Gabilan Range.
    - Diablo Range-Inner Coast Range.
    - East Bay Hills-Diablo Range.
    - Mount Diablo-Diablo Range.
    - Santa Cruz Mountains-Diablo Range.
    - Santa Cruz Mountains-Gabilan Range.

Objective 17-2. Enhance wildlife permeability across U.S. 101, SR 17, SR 152, SR 25, and other pinch points.

- **Action HC-2**. Identify road crossings with suitable habitat on both sides of the roadway for focal species or other native species and implement projects to protect them.

- **Action HC-3.** Remove or modify barriers to increase permeability to wildlife, and, where possible, install or repair crossings to increase permeability for the focal species and other native species.
- **Action HC-4.** Implement a public education campaign aimed at informing the public of the benefits of wildlife corridors and what can be done to improve permeability for wildlife.
- **Action HC-5.** Coordinate with state and local government agencies, including Caltrans, Santa Clara Valley Transportation Authority, City of San José , and Santa Clara County to implement actions that will improve landscape connectivity.

Objective 17-3. Enhance permeability in streams for anadromous fish and other aquatic species.

The actions under Section 3.6.1, *Central California Coast and Southern California Coast Steelhead*, will also be employed to meet Objective 17-3.

- **Action HC-6.** Identify and remove unnatural barriers to upstream migration for anadromous fish and other aquatic species.
- **Action HC-7.** Enhance the natural functions of floodplains.

3.7.1.2 Conservation Priorities

- Prioritize the steelhead habitat enhancement and connectivity projects listed under Conservation Priorities in Section 3.6.1, *Central California Coast and South-Central California Coast Steelhead*.
- Protect habitats within Critical Linkage Designs (Section 2.3.1.2, *Critical Linkages: Bay Area and Beyond*; Figure 2-22b) to expand and connect existing protected areas.
- Coyote Valley, the Soap Lake Floodplain, and the Upper Pajaro River are areas of critical landscape linkages for wildlife and plant dispersal between the Santa Cruz Mountains and the Diablo Range. Prioritize major projects and minor enhancements in these areas and other important pinch points to enhance or create linkages across U.S. 101, SR 17, SR 25, SR 152, Monterey Road in the Coyote Valley, Upper Pajaro River floodplain/Soap Lake floodplain, and other important movement routes, as guided by landscape connectivity studies described in Section 2.3.1, *Habitat Connectivity* (ICF International 2012, Diamond and Snyder 2013, Penrod et al. 2013, Wilmers et al. 2013, Diamond and Snyder 2016a, Diamond and Snyder 2016b, Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017, Santa Clara County Wildlife Corridor Technical Working Group, Coyote Valley Subcommittee 2019), or newly available studies. Projects may include modifying or replacing culverts or creating wildlife crossings such as overpasses or tunnels, as appropriate for the site-specific conditions.
- See Figure 2-22b for the locations of linkage features, including culverts, overpasses, and underpasses.[10] Priority linkage locations in the Soap Lake floodplain are shown as priority camera station locations on Figure 2-22b.

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[10] Underpasses are where wildlife cross under a movement barrier and an overpass is where wildlife are using a lesser road to cross over a barrier. In some cases, an underpass can also be a road crossing under a movement barrier.

Major priority areas where landscape connectivity should be improved include, but are not limited to, the following.

- The Trout Creek culvert along SR 17(Diamond and Snyder 2016a).
- SR 17 between Los Gatos and Lexington Reservoir (Diamond and Snyder 2016a).
- Across Monterey Road in the Coyote Valley (Santa Clara County Wildlife Corridor Technical Working Group, Coyote Valley Subcommittee 2019).
- Metcalf Road at Coyote Creek just north of Monterey Road (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017).
- Where Tick Creek crosses underneath U.S. 101 (Diamond and Snyder 2013).
- Along the Pajaro River at its intersection with U.S. 101 (Diamond and Snyder 2013).

Additional smaller-scale priority landscape connectivity projects include, but are not limited to, the following.

- Increase permeability across Coyote Valley and the Upper Pajaro River floodplain (i.e., Soap Lake Floodplain) for wildlife and plants using recommendations from the Coyote Valley Linkage Assessment Study (Diamond and Snyder 2016), the Coyote Valley Landscape Linkage Report (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017), and The Natural Conservancy's Pajaro Study 2012–2013 (Pajaro Study) (Diamond and Snyder 2013) as described in Section 3.6.9, *Mountain Lion*.
- In the Santa Cruz Mountains, focus protection in predicted core areas and corridors (Wilmers et al. 2013) (Figure H-9, Appendix H).
- Improve habitat quality adjacent to, and permeability through, the Lexington culvert along SR 17 (Diamond and Snyder 2016a).
- Increase landscape permeability along and across Monterey Road where it is adjacent to open space (i.e., Coyote Creek County Park) (ICF International 2012, Diamond and Snyder 2016a, Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017, Penrod et al. 2013). Remove barriers such as fences or gates in any other feasible locations along the Coyote Creek riparian corridor.
- Enhance permeability through the Aldercroft Creek culvert (Diamond and Snyder 2016a).
- Remove the vegetation blocking Red Fern Culvert 1 and Red Fern Culvert 2, located across from San Felipe Lake on SR 152 (Figure 2-22b).Work with Caltrans, landowners, and the Pajaro Compass participants (Pajaro Compass 2016) to restore riparian habitat along the Pajaro River (Diamond and Snyder 2013) to improve connectivity from the Santa Cruz Mountains to the Diablo Range.
- Add and maintain directional fencing on both sides of priority wildlife culverts identified in the documents listed above and shown on Figure 2-22b to safely guide wildlife into and out of the culverts. Repair sections of existing fences that have holes in dangerous locations for wildlife crossings.

3.7.1.3 Opportunities for Adaptation to Climate Change

Landscapes cover broad areas that include multiple interacting habitats and ecosystems processes that are critical for the survival of populations of focal species and other native species. In general, the predicted consequences of climate change at the landscape level will be increased frequency of extreme events such as floods and fires, increased temperatures, increased drought, changes in precipitation patterns, and sea-level rise (Beller et al. 2015). Additional stressors such as urban development, noxious weeds, and nitrogen deposition will likely magnify the effects of climate change on habitats and the species they support.

This RCIS recommends protecting large contiguous areas distributed across regional climate gradients, in part to provide areas where local range shifts driven by climate change may occur. Redundancy and spreading of risks are crucial to maintaining resilience in light of divergent climate change projections and general unpredictability (Bay Area Open Space Council 2011). This RCIS includes conservation goals and objectives to protect, increase, and enhance habitat connectivity and landscape linkages that will allow for natural communities and populations to shift their ranges in response to climate change. The large, busy roadways that bisect the RCIS area are major barriers to movement. The conservation objectives aimed at improving linkages in key locations along these roads will enhance movement by organisms across these major barriers, enabling dispersal in response to shifting habitats. The conservation strategy also includes conservation objectives and actions intended to remove in-stream barriers to movement to increase the amount of habitat available to aquatic species.

3.7.2 Working Landscapes

3.7.2.1 Conservation Goals and Objectives

Goal 18. Retain working lands for the benefit of focal species and other native species and agricultural uses where feasible in the RCIS area.

Objective 18-1. Work with agriculture producers and the ranching community to manage croplands and ranchlands in ways that maintain economically viable operations and benefit wildlife.

- **Action WL-1.** Work with local agencies (e.g., Resource Conservation Districts, Natural Resource Conservation Service) to establish programs (e.g., Safe Harbor Agreements) that conserve wildlife while protecting working lands.
- **Action WL-2-** Work with public and private landowners to cease the use of rodenticides, except where needed to retain structural integrity of infrastructure (e.g., earthen dams), and limit the use of pesticides and herbicides, particularly near focal species occurrences**,** and encourage land managers to use integrated pest management principals.
- **Action WL-3.** Provide education for agriculture producers and the ranching community regarding wildlife-friendly practices such as hedgerows, wildlife-friendly fencing, vegetation conditions that benefit wildlife, and management to promote ground squirrels and other keystone fossorial mammals.
- **Action WL-4.** Offer financial and regulatory incentives to private landowners to maintain and enhance habitat for focal species.

- **Action WL-5.** Introduce livestock grazing to reduce vegetation cover that currently excludes ground squirrels and encourage ground squirrel colonization.
- **Action WL-6.** Work with public and private landowners to incorporate focal species' habitat into existing operations.

3.7.2.2 Conservation Priorities

Prioritize these actions on farmland and ranchland in Coyote Valley and the Upper Pajaro River floodplain (i.e., Soap Lake Floodplain) with landowners willing to implement them. Coyote Valley and the Upper Pajaro River floodplain include agricultural lands that have the greatest conservation value for improvement of current farming practices to benefit native wildlife, particularly for improving wildlife connectivity.

3.7.2.3 Opportunities for Adaptation to Climate Change

Although the conversion of natural vegetation to working landscapes has eliminated large areas of native habitats, agricultural systems continue to support wildlife with compatible habitat needs, and can still provide breeding, foraging, and roosting habitat for some resident and migrant wildlife species. These species have come to rely on the habitat value of rangelands, certain cultivated lands, farming practices, and crop types. For example, tricolored blackbirds and Swainson's hawks rely on working lands for foraging habitat in the RCIS area and much of California.

Climate change may alter the environmental conditions necessary to grow crops in particular areas or may shift or shrink the distribution of rangelands, limiting their availability for the for the focal species that rely on them as foraging, dispersal, or breeding habitat (e.g., stock ponds). The conservation strategy includes conservation objectives and actions that recommend working with agricultural producers and the ranching community to provide working lands that maintain economically viable operations and habitats for wildlife. Land uses should be managed adaptively, to adjust to changing conditions in the landscape by providing or enhancing habitats that may be otherwise affected by climate change. For example, conservation organizations could offer to pay growers market rates to grow and harvest alfalfa or other crop types in ways that are beneficial to Swainson's hawk and economical for growers.

3.7.3 Serpentine Soils

3.7.3.1 Conservation Goals and Objectives

Goal 19. Protect habitat on serpentine soils, and the native species supported by serpentine soils, in the RCIS area.

Objective 19-1. Protect a diversity of serpentine land cover types in large, intact blocks in amounts needed to meet the conservation targets in Table 3-1.

- **Action SS-1.** Protect large blocks of land with serpentine soils on a range of environmental gradients.

Objective 19-2. Enhance land cover types on serpentine soils.

- **Action SS-2**. Use livestock grazing in a variety of regimes on serpentine grasslands and other rangelands that occur on serpentine soils to create a diversity of habitat conditions across the landscape.
- **Action SS-3**. Control invasive plant species in serpentine land cover types to reduce their competitive effects on native plants and enhance habitat for serpentine-endemic animals.

3.7.3.2 Conservation Priorities

Prioritize protection of serpentine land cover types that are adjacent to protected areas, as shown on Figure 2-10.

3.7.3.3 Opportunities for Adaptation to Climate Change

Serpentine soils are globally unique and locally rare in the RCIS area and support multiple endemic focal plant species (Bay Area Open Space Council 2011). The topography of a serpentine grassland (e.g., slope and aspect) can greatly affect vegetation and ecological conditions (e.g., south-facing slopes are warmer and dryer) and the suitability of habitat for focal plants and other native species. Changes in precipitation, temperature, and extreme weather events are expected to alter these already scarce habitats and their suitability for the rare species they support. The timing of rainfall, for example, may change the blooming period for the focal plant species. Climate change is also expected to affect the relative dominance of native versus non-native vegetation (U.S. Fish and Wildlife Service 1998a). Where populations on serpentine soils are small and isolated, changes in habitat suitability can cause localized extirpation.

The conservation goals, objectives, and actions in this RCIS provide for opportunities to adapt to climate change by emphasizing the protection of large, interconnected blocks of habitat along environmental gradients to help buffer the effects of climate change. These areas should be as large and as intact as possible to protect existing populations and allow populations to shift to new areas in response to climate change. As recommended by this RCIS, grazing and other tools to control invasive vegetation should be implemented within an adaptive management framework to control invasive species, which may become more problematic with climate change. This RCIS also facilitates adaptation to climate change by recommending actions that facilitate dispersal across the landscape, and assisted migration (e.g., creating new occurrences) of focal plant species through the translocation of seeds to suitable, but unoccupied, habitats.

3.7.4 Unique Land Cover Types

3.7.4.1 Conservation Goals and Objectives

Goal 20. Protect and manage unique land cover types to maintain a diversity of natural communities and habitats in the RCIS area.

Objective 20-1. Protect, enhance, and restore unique land cover types in amounts needed to meet the conservation targets in Table 3-1.

- **Action ULCT-1.** Work with the land managers to incorporate management practices that benefit unique land cover types on public and private lands.

- **Action ULCT-2.** Offer financial and regulatory incentives to private landowners to maintain and enhance unique land cover types that provide habitat for focal species and other native species.
- ***Action ULCT-3.*** Acquire, through fee title purchase or conservation easement, unique land cover types.
- ***Action ULCT-4.*** Restore unique land cover types.

Objective 20-2. Protect and manage bayland habitats for the benefit of rare, threatened, and endangered species and protect as broad a coastal zone as possible to allow space for tidal and subtidal to shift inland as sea-level rises, and to buffer more inland areas (including developed areas) from sea-level rise, consistent with the conservation plans in Appendix I, *Summary of Bayland Conservation Strategies*.[11]

- **Action ULCT-5.** Protect existing, historic, and restorable tidal marsh.
- **Action ULCT-6.** Enhance, restore, and create tidal and subtidal habitat, working with private and public landowners (e.g., Don Edwards National Wildlife Refuge).
- **Action ULCT-7.** Conduct studies to investigate key data gaps (e.g., population viability analysis or predation impacts) for focal and non-focal species that occur in the baylands.
- **Action ULCT-8.** Enhance and protect suitable habitat (e.g., barren or sparsely vegetated areas or salt ponds protected from predators) for use by threatened and endangered species such as western snowy plover and California least tern.
- **Action ULCT-9**. Provide more and wider buffers to tidal marshes, and improve management to reduce human intrusion and predators, using best current methods (e.g., seasonal habitat fencing, predator removal programs, or protecting nests with cages). Habitat management actions should be guided by the best available science and the techniques used on the Don Edwards National Wildlife Refuge

3.7.4.2 Conservation Priorities

Because unique land cover types, including the baylands, cover only a small part of the RCIS area (2% or less, for each unique land cover type), they are prioritized for protection and enhancement anywhere they occur.

The following creeks are prioritized for stream restoration due to 1) gaps in existing protections or recent restoration focus; 2) adjacency to protected areas; or 3) the presence of focal species (ICF International 2012, Goals Project 2015, Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017, San Francisco Bay Restoration Authority 2017).

- Coyote Creek.
- Stevens Creek.

[11] Because of the extensive conservation planning in the baylands, this RCIS refers to the existing conservation plans to guide voluntary conservation actions, habitat enhancement actions, and the development of mitigation credit agreements (MCA) for the natural communities, and focal and other native species in the baylands. It is the intent of this RCIS that by identifying and summarizing the conservation needs of species and their habitats that rely on the baylands, credits may be created through an MCA to offset future impacts to these species.

- Guadalupe River.
- Los Gatos Creek.
- Pacheco Creek.
- Laguna Seca.
- Fisher Creek.
- Permanente Creek.
- Adobe Creek.

3.7.4.3 Opportunities for Adaptation to Climate Change

Unique land cover types are those that have a very limited extent and distribution in the RCIS area, as described in Section 2.3.3, *Unique Land Cover Types*. Some of these land cover types are limited in distribution as a result of development or conversion to agriculture. This RCIS includes conservation goals, objectives, and actions to protect, enhance, and restore unique land cover types. Changes in temperature and precipitation patterns resulting from climate change may cause some areas of currently suitable habitat to become unsuitable for some species, while areas of currently unsuitable habitat may become suitable. Climate change is expected to affect many habitats and species such that temporal dynamics and spatial distributions change in unpredictable ways. This RCIS recommends protecting an interconnected network of habitats comprised of a diversity of land cover types along environmental gradients (e.g., elevation, water depth, slope, aspect), which will, in part, facilitate population shifts along these gradients to new habitats in response to climate change (Nunez et al. 2013).

3.8 Consistency with Approved Conservation Strategies and Recovery Plans

California Fish and Game Code 1852(c)(11) states that an RCIS shall have “an explanation of whether and to what extent the strategy is consistent with any previously approved strategy or amended strategy, state or federal recovery plan, or other state or federal approved conservation strategy that overlaps with the strategy area.” This section explains how this RCIS is consistent with these types of plans and strategies that overlap the RCIS area.

The RCIS area overlaps with the Santa Clara Valley Habitat Plan, an approved HCP/Natural Community Conservation Plan (NCCP) and seven other HCPs (Chapter 1, *Introduction*, Section 1.5.1, *Habitat Conservation Plans and Natural Community Conservation Plans*). Additionally, six federally approved recovery plans address species or resources in the RCIS area. Each of those plans are addressed below.

3.8.1 Consistency with the NCCP and HCPs

3.8.1.1 Santa Clara Valley Habitat Plan

The Habitat Plan (ICF International 2012), an HCP/NCCP, is by far the largest and most comprehensive HCP, and is the only NCCP, in the RCIS area (Figure 1-2). This RCIS has conservation goals and objectives similar to the biological goals and objectives of the Habitat Plan, especially for the species in common. In the Habitat Plan, biological goals and objectives are stated at the landscape, natural community, and covered species levels, while this RCIS provides goals and objectives for focal species, habitat connectivity and landscape linkages, working landscapes, serpentine soils, and unique land cover types.

See Section 3.5, *Relationship between this RCIS and the Santa Clara Valley Habitat Plan* for a description of how this RCIS, including the conservation goals, objectives, actions, and priorities complement, is consistent with the Habitat Plan. As described in Section 3.5, all of this RCIS' conservation goals, objectives, and actions are consistent with, and complementary to, the Habitat Plan's biological goals, objectives, and conservation actions for focal species and land cover types that are also Habitat Plan covered species and land cover types, as well as the protection and enhancement of habitat connectivity and landscape linkages.

The enhancement and restoration actions and priorities in this RCIS are intended to address the pressures and stressors affecting the focal species, habitats on serpentine soils, unique land cover types, and landscape connectivity. The conservation actions, habitat enhancement actions, and conservation priorities in this RCIS for conservation elements covered by the Habitat Plan are based largely on those in the Habitat Plan, because the pressures and stressors on these resources in the RCIS area are the same as, or very similar to, the pressures and stressors in the Habitat Plan's plan area. Furthermore, having similar, consistent conservation actions and habitat enhancement actions aimed at enhancing and restoring habitats will facilitate collaborative partnerships with the Habitat Agency, so that entities using the RCIS to partner with the Habitat Agency will be guided by the same suites of conservation actions and habitat enhancement action that the Habitat Agency will implement.

Comparison of Focal Species Conservation Strategies

Following is a summary about how the RCIS' objectives and actions are consistent and compatible with the Habitat Plan's biological objectives and actions for habitat enhancement and restoration objectives for focal species that are also Habitat Plan covered species. Section 3.5 and above describe how this RCIS' quantitative land protection objectives, and objectives to protect occurrences of species, are consistent and complimentary to the Habitat Plan.

California Tiger Salamander and California Red-legged Frog

California tiger salamander and California red-legged frog use similar upland and aquatic habitats in the RCIS area. This RCIS and the Habitat Plan include similar conservation objectives and actions to improve upland and aquatic habitat for California tiger salamander and California red-legged frog, as follows.

- Enhance upland habitat by managing vegetation with grazing and other methods.
- Manage invasive, non-native wildlife that depredate and compete with California tiger salamander and California red-legged frog.
- Reduce the threat of pathogens such as chytrid fungus.
- Increase populations of ground squirrels and burrow habitat (for California tiger salamander).
- Manage ponds to provide suitable vegetative cover.
- Restore and create habitat for California tiger salamander and California red-legged frog.

- Manage – through the use of fencing – potential impacts of livestock and feral pigs on aquatic habitat.
- Plant native aquatic vegetation to enhance or restore aquatic habitat.
- Improve hydrologic conditions (e.g., hydroperiod, water quality) of aquatic habitat.
- Install woody debris to provide basking habitat and cover for native amphibians and turtles.
- Assess the threat of hybridization between California tiger salamander and the non-native barred-tiger salamander.

Foothill Yellow-legged Frog

This RCIS and the Habitat Plan include conservation objectives and actions to improve habitat for foothill yellow-legged frog, as follows.

- Manage invasive, non-native wildlife.
- Plant or seed riparian vegetation.
- Replace confined, concrete, earthen, or other engineered channels to restore floodplain connectivity.
- Increase the amount of suitable cobblestone substrate to provide breeding habitat.
- Census egg masses downstream of reservoirs before and after releases.

Tricolored Blackbird

This RCIS and the Habitat Plan include conservation objectives and actions to improve nesting and foraging habitat for tricolored blackbird, as follows.

- Enhance and restore vegetation in ponds to provide nesting habitat for tricolored blackbird.
- Manage vegetation and enhance marsh habitat.
- Enhance foraging and breeding habitat by managing invasive vegetation.
- Incentivize landowners to manage agricultural, pond, and marsh habitat for tricolored blackbird.

Burrowing Owl

This RCIS and the Habitat Plan include conservation objectives and actions to improve habitat for burrowing owl, as follows.

- Enhance habitat by managing vegetation with grazing and other methods.
- Enhance burrowing owl habitat by prohibiting the use of rodenticides on protected lands, except where needed to retain structural integrity of infrastructure (e.g., earthen dams).
- Enhance burrowing owl habitat by creating artificial burrows to encourage use by burrowing owls.

San Joaquin Kit Fox

This RCIS and the Habitat Plan include conservation objectives and actions to improve habitat for San Joaquin kit fox, as follows.

- Remove barriers and improve movement corridors for San Joaquin kit fox.
- Create and improve opportunities for San Joaquin kit fox to cross major roads.
- Enhance habitat by managing vegetation with grazing and other methods.
- Enhance San Joaquin kit fox habitat by prohibiting the use of rodenticides on protected lands, except where needed to retain structural integrity of infrastructure (e.g., earthen dams).
- Conduct public outreach to educate landowners on strategies to benefit San Joaquin kit fox.

Mount Hamilton Thistle, Fragrant Fritillary, Loma Prieta Hoita, Smooth Lessingia, and Most Beautiful Jewelflower

This RCIS and the Habitat Plan include conservation objectives and actions to improve habitat for Mount Hamilton thistle, fragrant fritillary, Loma Prieta hoita, smooth lessingia, and most beautiful jewelflower, as follows.

- Enhance habitat.
- Conduct research on factors limiting population sizes.
- Manage invasive vegetation.
- Store and maintain seeds from natural occurrences at a Center for Plant Conservation certified botanic garden.

3.8.1.2 PG&E Bay Area Operations and Maintenance HCP

The PG&E Bay Area O&M HCP (ICF 2017) addresses impacts from day-to-day operation and maintenance activities as well as large maintenance projects that require extensive planning and coordination. The geographic scope of PG&E's Bay Area O&M HCP study area includes the nine California counties that surround San Francisco Bay: Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Mateo, and San Francisco. The Plan Area is a subset of a larger nine county Study Area and consists of PG&E gas and electric transmission and distribution facilities, plus right of ways (ROWs), the lands owned by PG&E or subject to PG&E easements to maintain these facilities, private access routes associated with PG&E's routine maintenance, a buffer around the ROWs, and mitigation areas acquired to mitigate for impacts resulting from covered activities. The Plan Area (where all activities covered under the HCP occur) encompasses approximately 402,440 acres with approximately 74,912 acres overlapping with the RCIS area. Within the Plan Area, approximately 128,735 acres are in natural land-cover types, many of which support endangered or threatened species' habitat.

PG&E received incidental take authorization for activities affecting 18 covered wildlife and 13 plant species. Of the 18 covered wildlife species, three are RCIS focal species: California tiger salamander, California red-legged frog, and San Joaquin kit fox.

The purpose of the Bay Area O&M HCP is to enable PG&E to continue to conduct covered activities in the Bay Area while avoiding and minimizing impacts on covered species and mitigating for impacts on covered species' habitats.

The conservation strategies for this RCIS and the Bay Area O&M are consistent and compatible, as they both include conservation measures aimed at increasing populations of California tiger salamander, California red-legged frog, and San Joaquin kit fox. This RCIS and the Bay Area O&M

HCP aim to 1) protect occurrences of California tiger salamander, California red-legged frog, and San Joaquin kit fox; 2) protect suitable habitat that potentially supports California tiger salamander, California red-legged frog, and San Joaquin kit fox; and 3) includes management actions to improve protected habitats to increase population sizes.

Purchase and preservation of high-quality natural lands, as part of the Bay Area O&M HCP, especially those already supporting multiple covered species, are most desirable in the overall conservation strategy of the plan. Lands that do not require intensive management to maintain existing habitat quality and those that provide opportunities for habitat enhancement also will receive high priority for acquisition as mitigation lands, similar to this RCIS. When mitigation for impacts to critical habitat is necessary, lands currently designated or proposed for designation as critical habitat, and which have the appropriate primary constituent elements, will be used. This RCIS recommends voluntary conservation priorities, including areas located within designated critical habitat of overlapping focal species. Because the Bay Area O&M HCP doesn't identify specific locations for mitigation actions, and because the RCIS program is voluntary, there is no conflict between this RCIS and the Bay Area O&M HCP.

3.8.1.3 Donald Von Raesfeld Power Plant Low-Effect HCP

The City of Santa Clara's electric department, doing business as Silicon Valley Power, owns and operates the Donald Von Raesfeld Power Plant (DVR), an electric-generating power plant in the City of Santa Clara. Nitrogen deposition from this power plant may adversely affect federally threatened and endangered serpentine endemic wildlife and plant species. The low-effect HCP was developed to quantify the potential for nitrogen deposition resulting from the DVR, develop appropriate mitigation measures, and procure an incidental take permit.

The species covered by the HCP include the federally-threatened Bay checkerspot butterfly, as well as four federally endangered plant species: the coyote ceanothus, Metcalf Canyon jewelflower, Santa Clara Valley dudleya, and the Tiburon paintbrush. While none of these species are included as focal species in this RCIS, they are endemic to serpentine grasslands, which is a conservation element addressed in this RCIS.

While the low-effect HCP is geared towards the protection and management of species covered by the HCP, the conservation strategy for serpentine soils in this RCIS (Section 3.7.3, *Serpentine Soils*) and low-effect HCP are consistent in that the RCIS recommends the protection, restoration, enhancement, and management of serpentine soils and grasslands using similar methods. The RCIS and low-effect HCP include conservation measures for management and enhancement of serpentine grasslands that include grazing and invasive species control.

3.8.1.4 Stanford University HCP

Stanford University owns more than 8,000 contiguous acres of land on the San Francisco Peninsula. Stanford's ongoing activities, such as construction of new facilities and certain activities to keep the University functioning could result in the incidental taking of species presently listed as threatened or endangered under the federal ESA. Stanford developed the HCP to receive take authorization from USFWS and CDFW incidental to activities related to long-term land use and academic planning and implementing conservation actions on its land. The HCP covers 8,180 acres, of which 4,372 acres are within Santa Clara County and Palo Alto in the RCIS area.

The HCP requires Stanford to undertake a wide range of conservation measures that will minimize the potential adverse effects of operating the University on the covered species. The HCP covers three species, two of which are focal species in this RCIS – California tiger salamander and California red-legged frog. The HCP's conservation program was developed to avoid and minimize the potential adverse effects of the covered activities on the covered species, and the mitigation measures fully mitigate for the unavoidable take of covered species. The goal the conservation program is to minimize the potential adverse effects of the covered activities, and to enhance the overall quality of habitat at Stanford for the covered species. The implementation of the HCP's conservation program provides an overall benefit to the covered species, despite the ongoing and future covered activities.

This RCIS is consistent with the conservation program established in the Stanford HCP. This RCIS and the Stanford HCP include measures and actions to restore, enhance, and manage habitat for California tiger salamander and California red-legged frog. The Stanford HCP includes conservation actions aimed at limiting and/or preventing development in breeding habitat for the California tiger salamander. Both the RCIS and HCP include conservation actions to restore and enhance habitat through grazing and invasive species management.

3.8.1.5 Los Esteros Low Effect HCP

The Los Esteros Critical Energy Facility (LECEF) LLC, completed a low-effect HCP in 2011 to convert the LECEF to a combined-cycle operation that increased the nominal generating capacity of the facility. The low effect HCP covers five serpentine endemic species, none of which are focal species in this RCIS. The project site (21-acres) is located in north San José, Santa Clara County. The 21-acre power plant itself is not in an area with serpentine habitat, but as a result of its emissions, the increase in nitrogen deposition could indirectly affect the species covered by the HCP within 9,926 acres of serpentine habitat in Santa Clara County.

To mitigate impacts from nitrogen deposition, the low-effect HCP includes conservation measures to protect, restore, enhance, and manage serpentine soils and grasslands. Specifically, a 40-acre parcel of serpentine habitat will be preserved to protect serpentine endemic species. This parcel will be managed to maintain suitable habitat for serpentine endemic species in perpetuity. The 40-acre parcel is located on Coyote Ridge in the Santa Clara Valley. The site is part of a larger property, which spans a portion of the Coyote Ridge from the Anderson Reservoir to Highway 101. The larger property contains habitat for the Bay checkerspot butterfly, the California red-legged frog, Santa Clara Valley dudleya, and Mount Hamilton thistle. The 40-acre parcel acquired by LECEF, LLC is located at the northern end of this larger property, adjacent to a 40-acre preservation parcel recently purchased by Silicon Valley Power in conjunction with the Pico Power Plant project.

Management actions on the 40-acre property are consistent with those recommended by this RCIS (Section 3.7.3, *Serpentine Soils*), and includes invasive species control and grazing on serpentine grasslands. Similar to this RCIS, management of serpentine grasslands on the 40-acre parcel has two primary objectives – to control invasive non-native plants and to foster the preservation of native grassland plant communities. Management tools include grazing, removing standing biomass and thatch, and recycling nutrients, with the goal of shifting the competitive balance from annual grasses to native bunchgrass and forb species.

3.8.1.6 PG&E Metcalf - El Patio, Metcalf -Hicks/Vasona Low Effect HCP

Completed in 2007, with a 3-year permit term, this low-effect HCP's plan area is located in central Santa Clara County and is divided into two linear sites. The sites include the footprint of the PG&E Metcalf El Patio 115kV transmission line and Metcalf Hicks/Vasona 230kV transmission line within Santa Teresa Park and on Tulare Hill. The 39.5 acre plan area includes rolling hills dominated by native serpentine grasslands, non-native annual grasslands, oak woodlands, oak savanna, coastal sage scrub, serpentine coastal sage scrub, and riparian habitats. The low-effect HCP only covers Bay checkerspot butterfly, which is not included as a focal species in this RCIS. This RCIS is consistent with, and complements, the PG&E Metcalf – El Patio, Metcalf-Hicks/Vasona Low Effect HCP because both the RCIS and the HCP include conservation measures that protect, restore, and enhance serpentine soils and grasslands. This RCIS (Section 3.7.3, *Serpentine Soils*) and the low effect HCP include enhancement activities such as grazing and invasive species control on serpentine grasslands.

3.8.1.7 PG&E Metcalf-Evendale/Monta-Vista HCP

Located in Santa Clara County, the Metcalf-Evendale/Monta-Vista low effect HCP was permitted in 1998 for a permit term of 3-years. The plan area totals 4.2 acres of annual grassland, serpentine grassland, interior live oak woodland, coastal sage scrub, and riparian habitats. The low-effect HCP only covers Bay checkerspot butterfly, which is not included as a focal species in this RCIS. This RCIS is consistent with, and complements, the Metcalf-Evendale/Monta-Vista Low Effect HCP because both the RCIS and the HCP include conservation measures that protect, restore, and enhance serpentine soils serpentine soils and grasslands. This RCIS (Section 3.7.3, *Serpentine Soils*) and the low-effect HCP include enhancement activities such as grazing and invasive species control on serpentine grasslands.

3.8.1.8 Zanker Road Resource Management HCP

The Zanker Road Resource Management low-effect HCP received incidental take coverage in 1999 for a permit term of 3-years. The plan area was 0.8 acre of ruderal grassland on levees of diked wetland. The HCP covered the salt marsh harvest mouse, which is not a focal species in this RCIS. This RCIS is consistent with, and complements, the Zanker Road Resource Management low-effect HCP by recommending the implementation of voluntary conservation actions recommended by existing bayland conservation strategies (see Objective 20-2, Section 3.7.4, *Unique Land Cover Types* and Appendix I, *Summary of Bayland Conservation Strategies*).

3.8.2 Approved Recovery Plans

There are nine federally approved recovery plans that address species or resources within the RCIS area. Each is discussed below. The purpose of federally approved recovery plans is to provide a framework for the conservation and survival of the listed species addressed in the recovery plan (ESA Section 4(f)(1)) that focuses and prioritizes threat abatement and restoration actions necessary to recover, and eventually delist, a species.

3.8.2.1 Coastal Multispecies Final Recovery Plan: California Coastal Chinook Salmon ESU, Northern California Steelhead DPS, and Central California Coast Steelhead DPS

The National Marine Fisheries Service approved *the Coastal Multispecies Recovery Plan for California Coastal Chinook Salmon, Northern California Steelhead, and Central California Coast Steelhead* (Chinook and Steelhead Coastal Recovery Plan) (National Marine Fisheries Service 2016). Central California Coast Steelhead is the only species of the three addressed in this recovery plan that occurs in the RCIS area (Figure H-1, Appendix H, *Focal Species Habitat Models*). The recovery plan addresses the Central California Coast distinct population segment (DPS), including five steelhead diversity strata,[12] two of which occur in the RCIS area (the Coastal San Francisco Bay and Interior San Francisco Bay diversity stratum), extending into the southern half of Santa Clara County within the San Francisquito Creek, Guadalupe River, Stevens Creek, Coyote Creek, and Alameda Creek stream systems.

The goal of the recovery plan is to remove the Central California Coast steelhead DPS from the federal list of endangered and threatened wildlife due to its recovery. The recovery plan objectives are to achieve the following.

- Reduce the present or threatened destruction, modification, or curtailment of habitat or range.
- Ameliorate utilization for commercial, recreational, scientific, or educational purposes.
- Abate disease and predation.
- Establish the adequacy of existing regulatory mechanisms for protecting Central California Coastal steelhead DPS now and into the future (i.e., post-delisting).
- Address other natural or manmade factors affecting the continued existence of Central California Coastal steelhead DPS.
- Ensure Central California Coastal steelhead DPS is at a low risk of extinction based on abundance, growth rate, spatial recovery, and diversity.

The Chinook and Steelhead Coastal Recovery Plan provides detailed recovery actions for Central California Coast Steelhead at the DPS level, for each diversity stratum, and each watershed within diversity stratum. Actions at all levels addressing targeted habitat attribute (e.g., floodplain, estuary, riparian, etc.) or threats for the diversity strata that occur in the RCIS area are listed in Table 3-7.

Actions described in the recovery plan are prioritized as follows.

- Priority 1. An action that must be taken to prevent extinction or to identify those actions necessary to prevent extinction.
- Priority 2. An action that must be taken to prevent a significant decline in population numbers, habitat quality, or other significant negative impacts short of extinction.
- Priority 3. All other actions necessary to provide for full recovery of the species.

[12] Diversity Strata are geographically distinct areas with similar environmental conditions (National Marine Fisheries Service 2016).

The goals, objectives, conservation actions, habitat enhancement actions, and priorities for this Santa Clara County RCIS were informed by the conservation actions described in the recovery plan for the diversity strata that occur in the RCIS area. Implementation of this RCIS's conservation actions and habitat enhancements for Central California Coast Steelhead (Section 3.6.1, *Central California Coast and South-Central California Coast Steelhead*), in-stream habitat connectivity (Section 3.7.1, *Habitat Connectivity and Landscape Linkage*), the baylands (Section 3.7.4, *Unique Land Cover Types*), and working landscapes (Section 3.7.2, *Working Landscapes*) will therefore contribute to the recovery plan's goal to recover the Central California Coast steelhead DPS and objectives as follows.

- Reducing the present or threatened destruction, modification, or curtailment of habitat or range;
- Addressing other natural or manmade factors affecting the continued existence of Central California Coast steelhead DPS; and
- Ensuring Central California Coast steelhead DPS is at a low risk of extinction based on abundance, growth rate, spatial structure, and diversity.

Table 3-7 identifies this RCIS' actions that address the targeted attributes or threats identified in the recovery plan for the RCIS area.

Table 3-7. Santa Clara County RCIS Actions that Address the Targeted Attributes and Threats Identified in the Coastal Multispecies Recovery Plan

Targeted Attribute or Threat from the Coastal Multispecies Recovery Plan Identified in the RCIS Area	Santa Clara County RCIS Actions that Address Targeted Attribute or Threats Identified in the Coastal Multispecies Recovery Plan
Estuaries	CCC-6, ULCT 3-5
Floodplain connectivity	CCC-1, CCC-2, CCC-5, CCC-11
Hydrology	CCC-8
Passage	CCC-4, CCC-7 HC-6
Habitat complexity	CCC-1, CCC-5, CCC-10
Riparian	CCC-1, CCC-5, CCC-11
Sediment	CCC-1, CCC-5, CCC-8, CCC-9
Water quality	CCC-5, CCC-9, CCC-11
Viability	CCC-1, CCC-4, CCC-5, CCC-7
Channel modification	CCC-1, CCC-5, CCC-10
Disease/predation/competition	N/A
Fishing/collecting	N/A
Hatcheries	N/A
Livestock	WL-1, WL 3-6
Mining	CCC-9
Recreation	CCC-1, CCC-11
Residential/commercial development	CCC-1, CCC-5, CCC-11
Roads/railroads	N/A
Severe weather patterns	N/A
Water diversions/impoundments	CCC-4, CCC-8, HC-6

3.8.2.2 Recovery Plan for the South-Central Coast Steelhead

The *South-Central California Coast Steelhead Recovery Plan* (South-Central Steelhead Recovery Plan) (National Marine Fisheries Service 2013) identifies four biogeographic population groups (BPG) in the South-Central California Coast steelhead Recovery planning area. Recovery of a minimum number of viable populations within each BPG will be necessary to recover the South-Central California Coast steelhead DPS as a whole. The RCIS area occurs within the Interior Coast Range BPG region. This is the largest of the four BPGs in the South-Central Steelhead Recovery Plan planning area and includes the east-facing (interior) slopes of the Central Coast Ranges (Santa Lucia Mountains and Santa Cruz Mountains) and the west-facing slopes of the Inner Coast Range (Diablo, Gabilan, Caliente, and Temblor ranges). This region extends 180 miles across the entire length (north-to-south) of the South-Central Steelhead Recovery Plan planning area and includes portions of Santa Clara, San Benito, Monterey, and San Luis Obispo Counties. This BPG consists of two major watersheds, the Pajaro River and Salinas River, which flow into the Pacific Ocean at Monterey Bay. The Pajaro River watershed includes the Salsipuedes, Corralitos, Casserly, San Benito River, Uvas, Pacheco and Llagas subwatersheds (Hunt & Associates 2008, Kier Associates and National Marine Fisheries Service 2008). Only the Pajaro Watershed portion of the range overlaps with the RCIS area.

The goal of the South-Central Steelhead Recovery Plan is to "to prevent the extinction of South-Central California Coast steelhead in the wild and ensure the long-term persistence of viable, self-sustaining, wild populations of steelhead distributed across the South-Central California Coast Steelhead (SCCCS) Distinct Population Segment (DPS). It is also the goal of this Recovery Plan to ensure a sustainable South-Central California Coast steelhead sport fishery through the restoration of viable steelhead populations across the SCCCS DPS."

The South-Central Steelhead Recovery Plan identifies the following objectives to achieve this goal.

- Prevent steelhead extinction by protecting existing populations and their habitats.
- Maintain current distribution of steelhead and restore distribution to some previously occupied areas.
- Increase steelhead abundance to viable population levels, including the expression of all life history forms and strategies.
- Conserve existing genetic diversity and provide opportunities for interchange of genetic material between and within viable populations.
- Maintain and restore suitable habitat conditions and characteristics to support all life history stages of viable populations.
- Conduct research and monitoring necessary to refine and demonstrate attainment of recovery criteria.

The South-Central Steelhead Recovery Plan identifies the following critical recovery actions within the Pajaro River Watershed (National Marine Fisheries Service 2013).

> "Develop and implement operating criteria to ensure the pattern and magnitude of groundwater extractions and water releases from Uvas Dam and Pacheco Dam to provide the essential habitat functions to support the life history and habitat requirements of adult and juvenile steelhead. Physically modify fish passage impediments, (e.g. Uvas Dam, to allow steelhead natural rates of migration to upstream spawning and rearing habitats, and passage of smolts and kelts downstream to the estuary and ocean and restoration of spawning gravel recruitment to the lower mainstem (e.g., Uvas Creek). Manage instream mining to minimize impacts to migration, spawning and rearing habitat in major tributaries, including Uvas, Corralitos, Llagas, and Pacheco Creeks, and the San Benito River. Identify, protect, and where necessary, restore estuarine rearing habitat, including management of artificial sandbar breeching at the river's mouth."

The South-Central Steelhead Recovery Plan identifies a full suite of recovery actions necessary to recovery South-Central California Coast steelhead populations, and to help achieve the goal of the South-Central Steelhead Recovery Plan. Table 9-4 in the South-Central Steelhead Recovery Plan lists 31 individual recovery actions for South-Central California steelhead in the Pajaro River Watershed and prioritizes recovery actions for the Pajaro River Watershed. Those activities are grouped into agricultural development, agricultural effluents, modify passage barriers (culverts and road crossings), dams and surface water diversions, flood control maintenance, groundwater extraction, levees and channelization, mining and quarrying, non-native species, recreational facilities, roads, upslope/upstream activities, urban developments, and urban effluents (National Marine Fisheries Service 2013).

This RCIS' conservation goal, objectives, conservation actions, habitat enhancement actions, and priorities for South-Central California Coast steelhead (Section 3.6.1, *Central California Coast and*

South-Central California Coast Steelhead) are consistent with, and complements, the South-Central Steelhead Recovery Plan's goal, objectives, priorities, and recovery actions. This RCIS prioritizes protecting, enhancing, and restoring South-Central California Coast steelhead habitat, removing barriers to passage, and managing invasive species. These actions align with those identified in the South-Central Steelhead Recovery Plan it can be used to identify specific locations or finer detail about the type of conservation actions and habitat enhancement actions needed in the Pajaro Watershed.

The RCIS does not address fish passage over dams at the same level of detail that is described in the South-Central Steelhead Recovery Plan. The RCIS does not address groundwater depletion and conservation actions and habitat enhancement that might be used to reduce the effects of groundwater drawdown on in-stream habitat. Instead the RCIS focuses on restoration activities that could be implemented to improve in-stream habitat with flows that exist today.

3.8.2.3 Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California

U. S. Fish and Wildlife Service approved the *Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California* (Tidal Marsh Recovery Plan) (U.S. Fish and Wildlife Service 2013). The Tidal Marsh Recovery Plan focuses on five endangered species: two endangered animals, California clapper rail (*Rallus longirostris obsoletus*) and salt marsh harvest mouse, and three endangered plants, Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*), sotft bird's beak (*Chloropyron molle* ssp. *molle*), and California sea-blite (*Suaeda californica*). The Tidal Marsh Recovery Plan addresses 11 species or subspecies of concern. These include the salt marsh wandering shrew (*Sorex vagrans halicoetes*), Suisun shrew (*Sorex ornatus sinuosus*), San Pablo vole (*Microtus californicus sanpabloensis*), California black rail (*Laterallus jamaicensis coturniculus*), three song sparrow subspecies of the San Francisco Bay Estuary (Alameda song sparrow [*Melospiza melodia ssp. pusillula*], Suisun song sparrow [*M.m. maxillaris*], and San Pablo song sparrow [*M.m. samuelis*]), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), old man tiger beetle (*Cicindela senilis senilis*), delta tule pea (*Lathryrus jepsonii* ssp. *jepsonii*), and Pacific cordgrass (*Spartina foliosa*). The Tidal Marsh Recovery Plan provides goals and objectives only for listed species, with the assumption that species of concern would also benefit from completion of those goals and objectives, since they occur in the same habitat types and locations.

The Tidal Marsh Recovery Plan describes five recovery units: Suisun Bay Area, San Pablo Bay, Central/South San Francisco Bay, Central Coast, and Morro Bay. The Santa Clara County RCIS falls within the Central/South San Francisco Bay Recovery Unit, which supports three of the endangered species: California clapper rail, Salt marsh harvest mouse, and California sea-blite.

Species that occur in the saltmarsh habitats of the South San Francisco Bay were excluded as focal species in this RCIS because there are many planning efforts underway that address these species. Instead of including tidal marsh species as focal species in this RCIS, and creating new conservation goals, objectives, actions, and priorities, Appendix I, *Summary of Baylands Conservation Strategies* consolidates information from the existing plans and strategies for those ecosystems, including the Tidal Marsh Ecosystems of Northern and Central California. Appendix I is organized by species, to provide a species-specific guide to existing conservation strategies. Furthermore, achieving this RCIS' Objective 20-2 will protect, enhance, and restore tidal and subtidal habitats within the RCIS area.

Achieving Objective 20-2 is consistent with, and will contribute to achieving, the Tidal Marsh Recovery Plan objectives as follows.

- Secure self-sustaining wild populations of each covered species throughout their full ecological, geographical, and genetic range.
- Ameliorate or eliminate, to the extent possible, the threats that caused the species to be listed or of concern and any future threats.
- Restore and conserve a healthy ecosystem function supportive of tidal marsh species.

This RCIS' Action ULCT-7, recommends conducting studies to investigate key data gaps for species that occur in the baylands in the RCIS area. This action is consistent with the Tidal Marsh Recovery Plan ecosystem-level recovery strategy to conduct range-wide species status surveys for listed species and species of concern, and to conduct research necessary for the recovery of listed species and the long-term conservation of species of concern (U.S. Fish and Wildlife Service 2013).

3.8.2.4 Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area

U. S. Fish and Wildlife Service approved the *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area* in 1998 (Serpentine Soils Recovery Plan) (U.S. Fish and Wildlife Service 1998a). The Serpentine Soils Recovery Plan features 28 species of plants and animals that occur exclusively or primarily on serpentine soils and serpentine grasslands in the San Francisco Bay Area, including three that are Santa Clara County RCIS focal species (Mount Hamilton thistle, smooth lessingia, and most beautiful jewelflower). These species occur in dry, nutrient-poor, serpentine soil grasslands of the greater San Francisco Bay Area and the adjacent foothills and valleys, including the serpentine grasslands of the RCIS area (Figure 2-10).

The overall objective of the Serpentine Soils Recovery Plan is to delist federally listed species and ensure the long-term conservation of species of concern. Interim goals include stabilizing and protecting populations, conducting research necessary to refine classification and recovery criteria, and reclassifying to threatened species currently listed as endangered.

The Serpentine Soils Recovery Plan presents a community-level strategy for recovery and conservation, because all of the listed species and species of concern co-occur in the same natural community. The likelihood of successful recovery for the listed species addressed by the Serpentine Soils Recovery Plan is increased by protecting entire communities, and by doing so, conservation of species of concern is possible. The community-level approach facilitates species recovery and conservation but does not negate the need to consider the requirements of each species addressed by the recovery plan.

Recovery and long-term conservation tasks emphasized in the recovery plan are the following.

- Habitat protection.
- Habitat management and restoration, including removal of invasive non-native species.
- Surveying and monitoring.
- Ex-situ conservation, such as artificial rearing and seed banking.
- Research.

- Public participation, outreach, and education.

The Serpentine Soils Recovery Plan identifies high priority protection areas of two general types: 1) areas currently occupied by or providing potential habitat for several species covered in the plan, and 2) areas that are currently occupied by, or providing potential habitat for, only a single species covered in the plan.

The goals, objectives, actions, and priorities for Mount Hamilton thistle (Section 3.6.11), smooth lessingia (Section 3.6.15), most beautiful jewelflower (Section 3.6.16), and serpentine soils (Section 3.7.3) for this RCIS were informed by the six elements listed above that compose the recovery plan's community-level recovery and conservation strategy, as outlined below.

Habitat protection. This RCIS prioritizes the protection of occupied habitat for focal plant species, including Mount Hamilton thistle, smooth lessingia, and most beautiful jewelflower. The conservation strategy recommends actions to survey habitat for these species to inform habitat protection. Furthermore, this RCIS includes Objective 19-1 and Action SS-1 to protect a diversity of serpentine land cover types in large, intact blocks on a range of environmental gradients.

Habitat management and restoration, including removal of invasive non-native species. This RCIS identifies objectives and actions for Mount Hamilton thistle, smooth lessingia, and most beautiful jewelflower to enhance habitat, including the removal of invasive species. Furthermore, this RCIS includes objectives and actions to enhance habitats on serpentine soils, including the control of invasive species, in the RCIS area to benefit other species that rely on serpentine habitats.

Surveying and monitoring. This RCIS includes actions to survey habitat to identify unrecorded occurrences of Mount Hamilton thistle, smooth lessingia, and most beautiful jewelflower. This RCIS also includes an adaptive management and monitoring strategy (Section 3.9, *Adaptive Management and Monitoring Strategy*) that can be used to develop adaptive management and monitoring plans for serpentine grasslands managed by entities or individuals interested in managing habitat to benefit serpentine species, and for use in MCAs.

Ex-situ conservation, such as artificial rearing and seed banking. This RCIS includes actions for Mount Hamilton thistle, smooth lessingia, and most beautiful jewelflower to bank seeds for future use in reintroduction and to restore and establish occurrences of these species.

Research. This RCIS includes actions that recommend conducting research to inform management of Mount Hamilton thistle, smooth lessingia, and most beautiful jewelflower.

Public participation, outreach, and education. Although this RCIS does not include public participation, outreach, and education specific to species that rely on serpentine soils and their habitats, this RCIS identifies potential implementation responsibilities that may be conducted during RCIS implementation that could help to publicize this RCIS and the benefits of implementing this RCIS.

3.8.2.5 Recovery Plan for Central California Distinct Population Segment of California Tiger Salamander

The U. S. Fish and Wildlife Service approved the *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander* (California Tiger Salamander Recovery Plan) in 2017 (U.S. Fish and Wildlife Service 2017). The goal of the California Tiger Salamander Recovery Plan is to reduce the threats to the Central California tiger salamander to ensure its long-term viability in the wild and allow for its removal from the list of threatened and endangered species. The range of the Central California tiger salamander has been classified into four recovery units. These recovery units are not regulatory in nature; the boundaries of the recovery units do not identify individual properties that require protection, but they are described solely to facilitate recovery and management decisions. The recovery units are the Central Valley Recovery Unit, the Southern San Joaquin Valley Recovery Unit, the Bay Area Recovery Unit, and the Central Coast Range Recovery Unit. The Bay Area Recovery Unit overlaps with the RCIS area.

The California Tiger Salamander Recovery Plan's strategy to recover the Distinct Population Segment (DPS) of Central California tiger salamander focuses on alleviating the threat of habitat loss and fragmentation to increase population resiliency (ensure each population is sufficiently large to withstand stochastic events), redundancy (ensure a sufficient number of populations to provide a margin of safety for the species to withstand catastrophic events), and representation (conserve the breadth of the genetic makeup of the species to conserve its adaptive capabilities) (U.S. Fish and Wildlife Service 2017). The California Tiger Salamander Recovery Plan includes the following objectives.

- Secure self-sustaining populations of Central California tiger salamander throughout the full range of the DPS, ensuring conservation of native genetic variability and diverse habitat types (e.g., across elevation and precipitation gradients).
- Ameliorate or eliminate the threats that caused the species to be listed, and any future threats.
- Restore and conserve a healthy ecosystem supportive of Central California tiger salamander populations.

Several recovery actions are identified in the Implementation Schedule for the Central California Tiger Salamander, starting on page III-14 of the California Tiger Salamander Recovery Plan (U.S. Fish and Wildlife Service 2017). Those actions are grouped into the following seven categories.

- Maintain current distribution of species.
- Maintain genetic structure across the species range.
- Reduce road mortality.
- Reduce the risk of introduction of diseases (e.g., ranaviruses, chytrid fungi, or other pathogens) within preserves.
- Reduce levels of non-native predator species within preserves.
- Develop and implement adaptive management and monitoring plans for protected habitat counted toward recovery.
- Monitor trends to gain a better understanding of population health, trends in habitat loss, and other information that will help to guide conservation planning for the Central California tiger salamander.

The conservation goals and objectives listed for California tiger salamander in the RCIS (Section 3.6.2, *California Tiger Salamander*) address all of the high-level recovery actions in the California Tiger Salamander Recovery Plan, listed above. The California Tiger Salamander Recovery Plan has much more detailed actions that the RCIS, but the actions are generally consistent. Certainly, the primary objectives to protect existing habitat across the range and reducing threats from non-native species and compromised genetic diversity are central pieces of both the RCIS and California Tiger Salamander Recovery Plan.

3.8.2.6 Recovery Plan for the California Red-legged Frog

U. S. Fish and Wildlife Service approved the *Recovery Plan for the California Red-Legged Frog* (California Red-legged Frog Recovery Plan) in 2002 (U.S. Fish and Wildlife Service 2002). The goal of the California Red-legged Frog Recovery Plan is to recover the species, with specific objectives related to the number and distribution of the species across its range. There are eight recovery units identified in the recovery plan. Three of those units (South and East San Francisco Bay, Central Coast, and Diablo Range and Salinas Valley) overlap the RCIS area. Within those recovery units, there are two Core Recovery Areas (East San Francisco Bay and Santa Clara Valley). Both Core Areas are currently occupied and considered to have source populations (i.e., a population that produces excess individuals that may be able to disperse to other areas and populations). The South San Francisco Bay Core Area overlaps slightly with the RCIS area, in the urbanized portion of Santa Clara County. The conservation needs for that Core Area are not specifically addressed in this RCIS, due to the minimal overlap restricted primarily to urban areas, though many of them are the same as those for the East San Francisco Bay Core Area.

Table 6 (Page 74) in the California Red-legged Frog Recovery Plan details the conservation needs in each Core Area. Table 3-8 lists the conservation needs for the two Core Areas that overlap the RCIS area. The table also lists the Core Areas where the needs are relevant according to the recovery plan and the objectives and actions in the RCIS that will help to address those needs. If needs are not addressed by the RCIS goals and objectives the reason is given.

Table 3-8. Conservation Needs Listed in the California Red-legged Frog Recovery Plan and the RCIS Goals and Objectives that Address Them

Conservation Need Identified in Recovery Plan	Core Recovery Area[a]	RCIS Objectives and Actions that Support Conservation Need
Protect existing populations	ESFB, SCV	Objectives 4-1, 4-2, 4-3, 4-4
Control non-native predators	ESFB, SCV	Action CRLF-6
Study effects of grazing in riparian corridors, ponds, and uplands	ESFB	This conservation need is not explicitly addressed in this RCIS; however, Actions CRLF-7 and CRFL-9 are intended to address impacts from grazing.
Reduce impacts associated with livestock grazing	ESFB	Action CRLF-7
Protect habitat connectivity	ESFB	Objectives 4-1, 4-2, 4-3, 4-4, 17-1, 17-2
Minimize effects of recreation and off-road vehicle use	ESFB	The RCIS has no authority to implement park and open space policy.
Avoid and reduce impacts of urbanization	ESFB	The RCIS has no authority to dictate local land use policies, though Objectives 4-1, 4-2, 4-3, 4-4 focus on the protection, enhancement, and restoration of habitat. Those areas would be protected from future urbanization.
Protect habitat buffers from nearby urbanization	ESFB	The RCIS has no authority to dictate local land use policies, though Objectives 4-1, 4-2, 4-3, 4-4 focus on the protection,

Conservation Need Identified in Recovery Plan	Core Recovery Area[a]	RCIS Objectives and Actions that Support Conservation Need
		enhancement, and restoration of habitat. Those areas would be protected from future urbanization. Also, the overall guidance of the conservation strategy to expand and connect existing habitats (see Section 3.6, *Conservation Strategy for Focal Species*) will help to buffer protected habitat from nearby urbanization.

Notes:

[a] East San Francisco Bay (ESFB); Santa Clara Valley (SCV).

3.8.2.7 Recovery Plan for Upland Species of the San Joaquin Valley, California

In 1998, the U.S. Fish and Wildlife Service approved the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (San Joaquin Valley Recovery Plan) (U.S. Fish and Wildlife Service 1998b). The San Joaquin Valley Recovery Plan planning area covers approximately 17,570 square miles across the San Joaquin Valley, Carrizo and Elkhorn Plains, and parts of the Cuyama, Salinas, and Sacramento, and other valleys. The San Joaquin Valley Recovery Plan planning area covers only a small portion of eastern Contra Costa and Alameda counties in the RCIS area. The San Joaquin Valley Recovery Plan addresses a total of 34 species of the San Joaquin Valley, 11 of which are federally protected species. Of these 11 species, six are plants: California jewelflower (*Caulanthus californicus*), palmate-bracted bird's beak, Kern mallow (*Ermalche kernensis*), San Joaquin woolly-threads (*Lembertia congdonii*), Bakersfield cactus (*Opuntia basilaris* var. *treleasei*), and Hoover's woolly-star (*Eriastrum hooveri*). Five animals are covered by the San Joaquin Valley Recovery Plan: giant kangaroo rat (*Dipodomys ingens*), Fresno kangaroo rat (*Dipodomys nitratoides*), Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*), blunt-nosed leopard lizard (*Gambelia sila*), and San Joaquin kit fox. Only San Joaquin kit fox occur in the RCIS area and is a focal species in the RCIS. The majority of the 34 species occur in arid grassland scrublands of the San Joaquin Valley and the adjacent foothills and valleys.

The San Joaquin Valley Recovery Plan includes site-specific protect requirements to meet the delisting criteria for the federally listed species, which includes only San Joaquin kit fox in the RCIS area. For San Joaquin kit fox, one satellite population must be present in the northern range and Valley edges, defined as Alameda, Contra Costa, San Joaquin and Stanislaus counties.

The goal of the San Joaquin Valley Recovery Plan is to delist the 11 listed species and achieve long term conservation of the candidate of species of concern, as well as other members of the biotic communities occupied by the listed species. The San Joaquin Valley Recovery Plan includes interim goals to stabilize and protect populations and to conduct research necessary to refine reclassification and recovery criteria and subsequently reclassify those listed species that are endangered to threatened. The San Joaquin Valley Recovery Plan uses an ecosystem-level strategy to establish a network of reserves and conservation areas that represent natural communities in the San Joaquin upland system. The San Joaquin Valley Recovery Plan includes the following objectives applicable to the RCIS area.

- Develop and implement a regional cooperative program and participation plan.

- Protect and secure existing populations.
- Determine distributions and population statuses of featured species.
- Conduct research and monitoring.
- Maintain and establish linkages in existing natural lands and between islands of habitat on the Central Valley floor and natural lands around the fringe of the Central Valley.
- Apply adaptive management to protected areas.
- If necessary, reintroduce species to appropriate habitat within their historic range.

The goal, objectives, actions, and priorities for San Joaquin kit fox in this RCIS (Section 3.6.8, *San Joaquin Kit Fox*) were informed by, and are consistent with, the recovery actions described in the San Joaquin Valley Recovery Plan. This RCIS includes the following actions and consistent with the San Joaquin Valley Recovery Plan.

- Acquire unprotected habitat.
- Protect regional movement corridors.
- Create wildlife crossings.
- Enhance San Joaquin kit fox habitat through grazing, working with private landowners, and targeted studies.

The RCIS also includes a conservation strategy for landscape connectivity (Section 3.7.1, *Habitat Connectivity and Landscape Linkages*), which includes objectives to protect habitat linkages and enhance permeability across major highways for the focal species.

The RCIS conservation strategy addresses all of the objectives from the San Joaquin Valley Recovery Plan for San Joaquin kit fox through land acquisition, land protection, surveys/research, habitat enhancement, including public outreach, and protection/creation of movement corridors. Implementing the RCIS conservation strategy to benefit San Joaquin kit fox will contribute towards achieving the San Joaquin Valley Recovery Plan's goal of delisting this species.

3.8.2.8 Recovery Plan for Western Snowy Plover Pacific Coast Population

In 2007, the U.S. Fish and Wildlife Service approved the *Recovery Plan for Western Snowy Plover Pacific Coast Population* (Western Snowy Plover Recovery Plan) (U.S. Fish and Wildlife Service 2007). The goal of the Western Snowy Plover Recovery Plan is to ensure the long-term viability of the Pacific coast western snowy plover population so that may be removed from the federal endangered and threatened species list. Western snowy plover is treated as a non-focal species by this RCIS and will be benefit from the baylands conservation strategy. The Western Snowy Plover Recovery Plan has the following three objectives.

- Increase population numbers distributed across the range of the Pacific coast population of the western snowy plover.

- Conduct intensive ongoing management for the species and its habitat and develop mechanisms to ensure management in perpetuity.
- Monitor western snowy plover populations and threats to determine success of recovery actions and refine management actions.

The Western Snowy Plover Recovery Plan has been divided into six recovery units that encompass all the known breeding and wintering sites for the Pacific coast populations of western snowy plover. The six recovery units are Washington and Oregon, Del Norte to Mendocino Counties, California, San Francisco Bay, California, Sonoma to Monterey Counties, California, San Luis Obispo to Ventura Counties, California, and Los Angeles to San Diego Counties, California. The RCIS area is within the San Francisco Bay, California recovery unit and includes four sub-units along the south San Francisco Bay: Knapp Salt Pond (CA-40), Alviso Salt Ponds (CA-41), Moffett Field (CA-42), and Crittenden Marsh (CA-43). The Western Snowy Plover Recovery Plan identifies distinct population goals for each recovery unit; the San Francisco Bay, California recovery unit subpopulation goal is 500 breeding adults, which includes sub-units outside of the RCIS area.

Implementing the actions to achieve the goal and objectives of the unique land cover types conservation strategy (Section 3.7.4, *Unique Land Cover Types*) will benefit western snowy plover. Objective 20-2 is to protect and manage bayland habitats for the benefits of rare, threatened, and endangered species, including western snowy plover. Action ULCT-8, recommends enhancing and protecting habitat for western snowy plover and Action ULCT-9 recommends managing for predators of species such as western snowy plover. Appendix I, *Summary of Baylands Conservation Strategies*, consolidates information from the existing plans and strategies for the baylands and including strategies to benefit western snowy plover. The intent of Appendix I is to provide a species-specific guide for the existing conservation strategies; as such, this RCIS is consistent and compatible with the Western Snowy Plover Recovery Plan.

3.8.2.9 Recovery Plan for California Least Tern

In 1985, the U.S. Fish and Wildlife Service approved the *Revised California Least Tern Recovery Plan* (California Least Tern Recovery Plan) (U.S. Fish and Wildlife Service 1985). California least tern (*Sterna antillarum browni*) is not a focal species but occurs in the RCIS area, primarily as post-breeding dispersants and will be benefit from the baylands conservation strategy. The primary goal of the California Least Tern Recovery Plan is to restore and subsequently maintain the breeding population of California least terns at a secure level so that delisting can be considered. The California Least Tern Recovery Plan states that for this to be achieved, the California breeding population must be a least 1,200 pairs distributed among 20 secure coastal management areas. To do this the California Least Tern Recovery Plan requires the following.

- Sufficient habitat to support at least one viable tern colony (defined as consisting of a minimum of 20 breeding pairs with a 5-year mean reproductive rate of at least 1.0 young fledged per year per breeding pair) at each of the 20 coastal management areas (including San Francisco, Mission Bay and Diego Bay, which should have 4, 6, and 6 secure colonies respectively), that are managed to conserve California least terns.
- Land ownership and management objectives are such that future habitat management for the benefit of least terns at those locations can be assured.

The recovery plan includes the following objectives for California least tern.

- Preserve and manage nesting habitat.
- Protect and managed non-nesting habitat.
- Monitor least tern populations to determine status, distributed and progress of management during the breeding season.
- Conduct research on California least tern to provide additional necessary information for tern management.
- Utilize existing laws and regulations protecting California least tern and its habitat.
- Develop and implement a conservation education program.

Implementing the actions to achieve the goal and objectives of the unique land cover types conservation strategy (Section 3.7.4, *Unique Land Cover Types*) will benefit California least tern. Objective 20-2 is to protect and manage bayland habitats for the benefits of rare, threatened, and endangered species, including California least tern. Action ULCT-8, recommends enhancing and protecting habitat for California least tern and Action ULCT-9 recommends managing for predators of species such as California least tern. Appendix I, *Summary of Baylands Conservation Strategies*, consolidates information from the existing plans and strategies for the baylands and including strategies to benefit California least tern. The intent of Appendix I is to provide a species-specific guide for the existing conservation strategies; as such, this RCIS is consistent and compatible with the California Least Tern Recovery Plan.

3.9 Adaptive Management and Monitoring Strategy

According to the CFGC 1856(b)(1), in order for an individual or entity to develop an MCA under this Santa Clara County RCIS, this RCIS must include an adaptive management and monitoring strategy for MCAs. This section is intended to provide an overview of adaptive management and monitoring and describes the framework that can be used to inform adaptive management and monitoring used in an MCA in the RCIS area. Requirements and processes for creating an MCA, including an adaptive management and monitoring plan, will be provided in CDFW's MCA Guidelines, which are expected to be released in the winter of 2019/2020.

Adaptive management and monitoring will only be required for conservation actions or habitat enhancement actions that are implemented under MCAs. An adaptive management and monitoring plan could be developed for any voluntary conservation action in the RCIS area (unrelated to an MCA), but it is not required. Such an adaptive management and monitoring plan consistent with the framework described in this section would provide the same benefits as those described for mitigation actions.

The overarching objective of the adaptive management and monitoring strategy is to ensure that conservation actions and habitat enhancement actions are implemented and maintained in ways that benefit focal species and other resources credited under an MCA and contribute to the achievement of conservation goals and objectives stated in the RCIS. The key elements of the framework are outlined and described in this section. The level of detail and application of the framework will vary depending on the size and complexity of the MCA site or sites, the resources being monitored, and the nature of the conservation action or enhancement actions being executed.

3.9.1 Periods of Adaptive Management and Monitoring

Adaptive management and monitoring can be organized into two periods: interim management period and long-term monitoring management period. Key tasks in each phase are described in this section.

3.9.1.1 Interim Management Period

The interim management period is the period from when the MCA site is been authorized to use or transfer credits until performance standards have been met and the third anniversary of the full funding of the endowment amount has occurred (see the MCA portion of CDFW's RCIS Program Guidelines for more details). During this period, conservation actions and habitat enhancement actions are implemented (the type[s] of conservation action and habitat enhancement action will depend on the condition of resources, such as habitat, at the site, or if resources are being restored or created), and ecological performance monitoring is conducted to assess the progress and status of resources being enhanced or restored. If ecological performance standards are not met, remedial actions will be implemented. Monitoring is more intensive and frequent during this period than it is under long-term management, and there may be different or additional management actions required during the interim management period that are not required during the long-term management period.

During the interim management period, management of the site will be guided by the interim management plan, which describes the conservation actions or habitat enhancement actions, adaptive management, monitoring, reporting and other activities to be implemented by the MCA sponsor.

3.9.1.2 Long-Term Management Period

The long-term monitoring period begins upon conclusion of the interim management period and continues for the length of the MCA site's durability instrument, which may be in perpetuity for a conservation action, or a shorter period for an habitat enhancement action.

During the long-term management period, management of the site will be guided by the long-term management plan, which will include measures intended to ensure that the MCA site or sites are managed, monitored, and maintained in perpetuity (or a shorter period, as applicable, for a habitat enhancement action), to conserve and protect the resources that support MCA credits, and other natural resources.

As much as possible, the long-term management plan should be a practical guide to management and monitoring actions that will occur on the MCA site over time, written with the land manager and monitors in mind. It should also be appropriately scaled to the resources available through the endowment, and provide for a hierarchy of needs (i.e., using funding to manage resource needs that support MCA credits before other needs).

Similar to adaptive management actions, the monitoring program can change over time in response to the information collected and the trends observed. This adaptive approach to monitoring ensures that enough data are being collected to determine whether the mitigation site is performing as expected, while also avoiding unnecessary monitoring costs, particularly once the effectiveness of the site has been documented through several years of monitoring.

3.9.2 Adaptive Management

Adaptive management is a decision-making process that adjust actions as uncertainties become better understood or as conditions change. Documenting actions and monitoring the outcomes of management is the foundation of an adaptive approach, and thoughtful monitoring can both advance scientific understanding and modify management actions iteratively (Williams et al. 2007).

Adaptive management is necessary because of the degree of uncertainty and natural variability associated with ecosystems and their responses to management. It is possible that additional and different actions not described in this Santa Clara County RCIS or an MCA will be identified in the future and proven to be more effective. Results of monitoring may also indicate that some management measures are less effective than anticipated. To address these uncertainties, an adaptive approach will be used to inform management on land subject to MCAs.

The cornerstone of an adaptive management and monitoring program is an approach in which monitoring yields scientifically valid results that inform management decisions. Information collected through monitoring and other experiments is used to manage mitigation lands and help determine progress toward conservation objectives.

Adaptive management may include the following.

- Evaluate efficacy of monitoring protocols.
- Incorporate best available scientific information into management decisions.
- Review any unexpected or unfavorable results and test hypotheses to achieve desired outcome.
- Adjust management actions and continue to monitor.
- Adjust success criteria and actions, if necessary.

3.9.3 Types of Monitoring

Types of monitoring that may be included in a monitoring plan include, but are not limited to, conservation easement monitoring and effectiveness monitoring. The monitoring plan may also include protocols, indicators, a monitoring schedule, and success criteria.

3.9.3.1 Conservation Easement and Long-Term Durability Instrument Monitoring

Conservation easement monitoring tracks the status of mitigation sites under a conservation easement and documents that the requirements of the conservation easement are being met, to protect the conservation values of the site. A similar type of monitoring may be used to track the status of a site used for a habitat enhancement action under a long-term durability instrument. Conservation easement and long-term durability instrument monitoring may include the following components.

- Maintaining the property in a condition consistent with the easement or long-term durability instrument.
- Maintaining infrastructure and access as stated in the easement or long-term durability instrument.
- Implementing conservation and habitat enhancement actions as described in the MCA.

- Implementing management actions as described in the MCA.
- Reporting of monitoring activities conducted.

3.9.3.2 Effectiveness Monitoring

Effectiveness monitoring assesses the biological success or failure of conservation actions or habitat enhancement actions. Monitoring results may also be used to determine when mitigation credits can be released and when they are available for use or sale. Effectiveness monitoring may also be used on voluntary conservation investments sites to determine if management actions are achieving the desired outcomes.

Effectiveness monitoring is focused on the status of focal species or other conservation elements in the RCIS area for which mitigation credit has been assigned under the MCA. Understanding the effects of management actions is a critical component of the adaptive management and monitoring program. The purpose of effectiveness monitoring is to ascertain the success of initial actions and management actions in achieving desired outcomes and to provide information and mechanisms for altering management, if necessary. Results from effectiveness monitoring can also be used to establish how implementation of the MCA or voluntary conservation investment contributes to the achievement of RCIS conservation goals and objectives.

Chapter 4
Implementation

After approval by CDFW, this Santa Clara County RCIS can be used to inform decisions related to land acquisition, restoration, enhancement, and management actions for focal species, other species, and other conservation elements addressed by the RCIS. Examples of how the RCIS may be used include the following.

- Inform how conservation organizations make conservation investments in the RCIS area.
- Inform how state or federal agencies evaluate grant or permit applications for local conservation or research projects.
- Assist with guiding project proponents in how they site and design proposed compensatory mitigation required pursuant to (a) a California Endangered Species Act permit, (b) a lake or streambed alteration agreement under FGC 1600, (c) a California Environmental Quality Act (CEQA) document, or possibly other state or federal regulatory permits, such as Federal Endangered Species Act and Clean Water Act Sections 404 and 401.
- Support the siting, design and creation of conservation and mitigation banks.
- Guide landowners, public agencies, private entities, or others interested in establishing a mitigation credit agreement (MCA) with CDFW to provide a mechanism for compensatory mitigation.

This chapter describes the implementation process and provides an overview of the new tool enabled by the RCIS, an MCA. Requirements and processes for creating an MCA will be provided in CDFW's MCA Guidelines, which are expected to be finalized by the end of 2019. This chapter also identifies ways that may be used to implement this RCIS but are not necessarily required by CFGC or the Program Guidelines. For example, the implementation committee, described in Section 4.3.1.1, *Implementation Committee*, is not required by CFGC or the Program Guidelines, but is offered as a suggestion for how local entities may support implementation of the RCIS. Items that are suggestions and not requirements are denoted as those the RCIS proponent *may* do, as opposed to required elements that they *will* do or *shall* do. To make it explicit, Section 4.2, *Required RCIS Implementation Activities to Create MCAs*, describes those elements required during implementation and Section 4. 3, *Other Potential RCIS Proponent Activities*, describes elements that are not required, but may prove helpful.

The Santa Clara County RCIS is a non-binding, voluntary conservation strategy. The RCIS proponent is only responsible for updating the scientific information in this RCIS and evaluating the effectiveness of this RCIS's conservation actions, habitat enhancement actions, and progress towards achieving this RCIS's goals and objectives least once every 10 years (Section 4.2, *Required RCIS Implementation Activities to Create MCA*). Entities pursuing MCAs under the RCIS are responsible for funding their involvement in, and development of, those MCAs; the RCIS proponent would bear no financial or other responsibility for development or monitoring of those MCAs.

4.1 Goals of Implementation

The purpose of this RCIS is to provide information to facilitate the implementation of conservation actions and habitat enhancement actions. These actions include those driven by regulatory needs (primarily in the form of mitigation) as well as voluntary conservation actions. This Santa Clara County RCIS was developed to guide investments in conservation, infrastructure, and compensatory mitigation to help ensure that conservation actions and habitat enhancement actions in the RCIS area are occurring in an informed and strategic manner to achieve the highest degree of conservation benefit at a regional scale.

4.2 Required RCIS Implementation Activities to Create MCAs

As a voluntary planning and guidance document, there are no implementation requirements for this RCIS. For an RCIS to be used to create MCAs, however, CFGC 1856(b) has requirements for what must be included in the RCIS, and what must be done after the RCIS is approved by CDFW, above and beyond what is required of an RCIS that does not support MCAs. This RCIS is intended to support creation of MCAs, so it includes additional required elements. For an RCIS to support an MCA, CFGC 1856(b) states the following.

> (b) For a conservation action or habitat enhancement action identified in a regional conservation investment strategy to be used to create mitigation credits pursuant to this section, the regional conservation investment strategy shall include, in addition to the requirements of Section 1852, all of the following:
>
> > (1) An adaptive management and monitoring strategy for conserved habitat and other conserved natural resources.
> >
> > (2) A process for updating the scientific information used in the strategy, and for tracking the progress of, and evaluating the effectiveness of, conservation actions and habitat enhancement actions identified in the strategy, in offsetting identified threats to focal species and in achieving the strategy's biological goals and objectives, at least once every 10 years, until all mitigation credits are used.
> >
> > (3) Identification of a public or private entity that will be responsible for the updates and evaluation required pursuant to paragraph (2).

The Program Guidelines (California Department of Fish and Wildlife 2018) define the *RCIS proponent* as the public agency or group of public agencies responsible for the technical and administrative updates to an RCIS. The RCIS proponent for the Santa Clara RCIS is the Santa Clara Valley Open Space Authority (Authority). The Authority may share, designate, or transfer the RCIS proponent role to another entity or entities at any time, or elect to terminate its role as RCIS proponent.[1]

As the RCIS proponent, the Authority will be responsible for updating this RCIS and tracking the progress and effectiveness of conservation and habitat enhancement actions in achieving this RCIS's

[1] The Authority has every intention of remaining the RCIS proponent and either renewing the RCIS or transferring the responsibility to renew the RCIS to another entity at the end of the first 10 years. However, if the Authority is unable to renew the RCIS due to budget or other constraints, and no other entity is willing to take on the responsibility, the RCIS may expire and no longer be valid.

conservation goals and objectives. The Authority will coordinate with the Santa Clara Valley Habitat Agency (Habitat Agency) to ensure that updates to this RCIS are consistent and compatible with the Santa Clara Valley HCP/NCCP (Habitat Plan) (ICF International 2012). An implementation committee, if formed, may assist the Authority with these responsibilities. Specifically, this RCIS includes the following elements, to facilitate the creation of MCAs, as described in the Program Guidelines (California Department of Fish and Wildlife 2017) (also see Table 1-1).

- An adaptive management and monitoring strategy (Chapter 3, Section 3.9, *Adaptive Management and Monitoring Strategy*).
- A process for updating the scientific information at least once every 10 years (Section 4.2.1, *Updating this RCIS with Best Available Science*).
- A process for tracking the progress and effectiveness of conservation and habitat enhancement actions in achieving the goals and objectives and offsetting the effects of identified pressures and stressors at least once every 10 years (Section 4.2.2, *Assessing Progress*).
- Identification of an RCIS proponent (see above).

4.2.1 Updating this RCIS with Best Available Science

In compliance with CFGC 1856(b), which requires that each RCIS include a process for updating the scientific information used in the strategy at least once every 10 years, the Authority will conduct a review to update and refine, if necessary, the strategy based on current scientific information. The Authority may use various data sources to inform the update, including, but not limited to, recent scientific literature, technical reports or studies, MCA reports, and guidance from regulatory agencies. The review may reconsider the assumptions on which the strategy was built, particularly related to focal species and conservation priorities. The results of this evaluation shall be integrated into the revised RCIS to be submitted to CDFW for approval to extend the RCIS approval period, after the initial 10-year approval period has ended. If the review is conducted a substantial amount of time (e.g., years) before the initial 10-year approval period ends and results of this review reveal that fundamental aspects of this Santa Clara County RCIS are no longer valid, the Authority may elect to amend this RCIS to address the changes, as outlined in Section 4.7, *Extending and Amending the RCIS*.

If CDFW determines that an approved RCIS needs to be updated or evaluated more frequently and the RCIS proponent declines to do so, MCA proponents or CDFW may elect to update the RCIS. Any such updates shall become part of the approved RCIS, pending an evaluation by CDFW (California Department of Fish and Wildlife 2018).

4.2.2 Assessing Progress

In compliance with CFGC 1856 (b), the Authority, in coordination with the Habitat Agency, and potentially with the support of an implementation committee, will assess the effectiveness of this RCIS's conservation actions and habitat enhancement actions in achieving the goals and objectives for the focal species and other conservation elements (Chapter 3, *Conservation Strategy*) and offsetting the effects of identified pressures and stressors.

4.2.2.1 RCIS Progress Report

The evaluation of the effectiveness of this RCIS's conservation actions, habitat enhancement actions, and progress towards achieving this RCIS's goals and objectives will occur at least once every 10 years in a report submitted to CDFW at the end of the 10-year approval term. Alternatively, the contents of this progress report will be included in the updated Santa Clara County RCIS submitted to CDFW for renewal after the 10-year approval period has ended.

To the extent feasible, the RCIS progress report or updated Santa Clara County RCIS submitted to CDFW for renewal will summarize the following.

- The net change in the amount of protected habitat in the RCIS area. The net change in area should be provided in acres, though for certain ecological features, net change may be provided in other relevant metrics (as specified in the MCA), such as length and width of a restored riparian woodland.
- A summary of the net change in quality of focal species' habitat addressed in the MCAs, using the metrics described in the MCA.
- A summary of the progress made towards achieving this RCIS's conservation goals and objectives through the implementations of the conservation actions and habitat enhancement actions described in Chapter 3, *Conservation Strategy*.

MCA sponsors with mitigation sites in the RCIS area are expected to contribute to tracking the progress and effectiveness of conservation actions and habitat enhancement actions in achieving this RCIS's goals and objectives by providing data and relevant information to the Authority. As stated in the Program Guidelines "[a]ll MCA sponsors shall contribute to collecting data and providing the data to the RCIS proponent to assist with the implementation and completion of the items below," which includes updating the RCIS's scientific information and tracking and reporting on the effectiveness of conservation actions and habitat enhancement actions in achieving this RCIS's goals and objectives (California Department of Fish and Wildlife 2018).

The Authority may request from each MCA sponsor with mitigation sites in the RCIS area an MCA summary report to assist the Authority's assessment of the effectiveness of this RCIS's conservation actions and habitat enhancement actions in achieving the goals and objectives for focal species and other conservation elements. The level of information MCA sponsors are expected to provide should be sufficient to assess progress towards meeting the RCIS's conservation objectives addressed by the conservation actions or habitat enhancement actions implemented through the MCA (California Department of Fish and Wildlife 2018). The Authority or CDFW may provide MCA sponsors with an MCA summary report template to facilitate consistent and adequate reporting by MCA sponsors.

To the extent feasible, the RCIS progress report may include a summary of other conservation actions and habitat enhancement actions undertaken in the RCIS area not conducted as part of an MCA, if this information is available to the Authority (e.g., conservation of habitat by non-governmental conservation organizations). Regional partners are encouraged to share with the Authority data and other information about conservation actions and habitat enhancement actions implemented in the RCIS area, but the Authority will not be responsible for tracking and reporting data and information from these entities. The Authority may use this information, in combination with information provided by MCA sponsors, to assess progress in achieving this RCIS's conservation goals and objectives.

Other sources of data and information may be used, such as the current versions of the California Protected Areas Database (California Protected Areas Database 2019) and the California Conservation Easement Database (California Conservation Easement Database 2019), as well as websites maintained by CDFW, U.S. Fish and Wildlife Service, and U.S. Army Corps of Engineers[2] that provide up-to-date information on approved conservation and mitigation banks, among other sources.

4.3 Other Potential RCIS Proponent Activities

Section 4.2, *Required RCIS Implementation Activities to Create MCAs*, describes the minimum requirements for implementation if the RCIS is to be used to create MCAs, as outlined in CFGC and the Program Guidelines. Beyond those requirements, the Authority has the discretion and flexibility to implement the RCIS in a manner consistent with the vision of their organization and level of funding available at any given time. The following subsections describe some optional items that the Authority may consider during implementation.

4.3.1 Implementation Committee

The Authority may choose to team with other public agencies, organizations, or collaborators to form an RCIS implementation committee. This implementation committee would help guide implementation and updates of this Santa Clara County RCIS, particularly in instances where implementation of this RCIS would support the missions of these other organizations. Potential implementation committee members may include representatives from the following organizations.

- Santa Clara Valley Habitat Agency.
- California State Coastal Conservancy.
- County of Santa Clara Parks and Recreation Department.
- Peninsula Open Space Trust.
- Midpeninsula Regional Open Space District.
- Santa Clara Valley Transportation Authority.
- Santa Clara Valley Water District.
- The Nature Conservancy.
- Other interested cities, jurisdictions, or parties.

The role of the implementation committee would be to periodically assist the Authority on all aspects of implementation. The implementation committee may also choose to serve as a group to help inform and educate potential RCIS users of how it can be used and the benefits it provides. The implementation committee will not arbitrate or negotiate mitigation on behalf of project

[2] Up-to-date information on approved conservation and mitigation banks can be found at the following U.S. Fish and Wildlife Service, CDFW, and U.S. Army Corps of Engineers websites:
https://www.fws.gov/sacramento/es/Conservation-Banking/Banks/In-Area/es_conse-bank-in-area.htm
https://www.wildlife.ca.gov/Conservation/Planning/Banking/Approved-Banks
http://www.spn.usace.army.mil/Missions/Regulatory/Mitigation-Banks/Approved-Banks-for-the-San-Francisco-Regulatory-Di/

proponents. Such responsibility will remain with the entity pursuing the mitigation and the regulatory agencies.

In summary, the following are potential roles for the implementation committee (this list is not exhaustive).

- Publicize this Santa Clara County RCIS and its successful implementation to participating agencies and other entities that may use this RCIS to inform conservation actions and habitat enhancement actions.
- Answer questions from users and potential users of this RCIS.
- Develop guidance, as needed, to clarify and refine components of this RCIS.
- Assist with preparation of the progress report, or other documents for CDFW, as needed, documenting the implementation of this RCIS and MCAs, as appropriate.
- Support the Authority in undertaking periodic updates of this RCIS (at least every 10 years) based on significant new information on the focal species and their conservation.

If established, the implementation committee should meet periodically (e.g., annually) to review how this Santa Clara County RCIS is being utilized, and to assess whether information updates or an amendment is needed.

4.3.1.1 Annual Meeting

The implementation committee may host an annual meeting to update the public on the progress and challenges with implementation during the previous year. It would be an opportunity to update the public on any changes that have been made to the RCIS and any new information that has been added. The agenda for the meeting could be determined by the implementation committee in cooperation with the RCIS proponent to ensure that key issues related to implementation are discussed.

4.4 Using this RCIS to Achieve Conservation Investment and Advance Mitigation

This Santa Clara County RCIS provides a framework for identifying regional conservation priorities and actions for focal species and other conservation elements. The conservation goals and objectives are designed to be broad-based yet comprehensive in identifying those actions necessary to ensure the long-term conservation of the focal species and other species addressed by this RCIS. While centered on focal species, this RCIS also addresses other key conservation elements including habitat connectivity and wildlife linkages, working landscapes, serpentine soils, and unique land cover types. As such, the RCIS proponent anticipates that a combination of conservation investments, MCAs, and compensatory mitigation completed outside of an MCA will be needed to achieve this RCIS's conservation goals and objectives. This RCIS also anticipates that success in meeting the conservation goals and objectives will require flexibility, creativity, and establishment of partnerships in conservation.

4.4.1 Conservation Partners

This Santa Clara County RCIS encourages agencies and organizations that may use this RCIS to guide conservation investments to consider other agencies or organizations operating in the RCIS area if the needs of those agencies or organizations align in a way that would support more robust and more effective implementation of one or more conservation priorities. The following entities, among others, are engaged in conservation activities in the RCIS area.

- Amah Mutsun Land Trust.
- California Department of Fish and Wildlife.
- California State Coastal Conservancy.
- California State Parks.
- County of Santa Clara Department of Parks and Recreation.
- Don Edwards San Francisco Bay National Wildlife Refuge.
- Guadalupe-Coyote Resource Conservation District.
- Loma Prieta Resource Conservation District.
- Midpeninsula Regional Open Space District.
- Peninsula Open Space Trust.
- Resource Conservation District of Santa Cruz County.
- Santa Clara Valley Habitat Agency.
- Santa Clara Valley Open Space Authority.
- Santa Clara Valley Transportation Authority.
- Santa Clara Valley Water District.
- San Francisco Bay Restoration Authority.
- San Francisquito Creek Joint Powers Authority.
- Land Trust of Santa Clara Valley.
- The Nature Conservancy.
- U. S. Army Corps of Engineers.
- U. S. Fish and Wildlife Service.
- U. S. Geological Survey.

The implementation committee, when and where appropriate, will look for innovative ways to support others taking the lead in making conservation investments and developing MCAs provided that they are consistent with this Santa Clara County RCIS and would help to achieve the goals and objectives of this RCIS.

4.4.2 Mitigation Credit Agreements

An MCA identifies the type and number of credits a person or entity proposes to create by implementing one or more conservation actions or habitat enhancement actions, as well as the terms and conditions under which those credits may be used. Credits may be used to meet compensatory mitigation obligations for focal species, non-focal species, and other natural resources (CFGC 1856(a)). MCAs must be prepared according to the requirements of CFGC 1856 and the RCIS Program Guidelines.

An MCA helps establish advance mitigation and can provide a number of significant benefits, particularly for agencies or entities with predictable long-term mitigation needs. An MCA can provide the following benefits.

- The MCA sponsor can set aside or purchase lands, when doing so is most cost effective, knowing those lands will provide useful mitigation values in the future. It is recommended, however, that a mitigation site is vetted through the appropriate regulatory agencies before the site is purchased.
- Mitigation credits can be pooled across large sites or multiple sites, providing economies of scale to deliver mitigation more efficiently across many projects.
- Although the use of MCA credits to satisfy mitigation obligations for a particular project must be assessed on a case-by-case basis, an MCA provides certainty and predictability to the MCA sponsor that conservation and habitat enhancement actions undertaken pursuant to that MCA will constitute mitigation under applicable state laws.
- An MCA can demonstrate to CDFW and other resource agencies that proposed mitigation fits within a larger approved conservation framework (the RCIS) and that investments in resource protection, restoration, and enhancement collectively contribute to meeting regional conservation goals and objectives.

Once this Santa Clara County RCIS is approved by CDFW, any public or private entity may prepare, for CDFW approval, an MCA for one or more conservation actions or habitat enhancement actions that measurably advance the conservation goals and objectives of the RCIS. A person or entity, including a state or local agency, with mitigation needs may choose to enter into an MCA with CDFW for a single mitigation site, a single mitigation site with multiple phases, or a suite of mitigation sites.

MCAs will primarily facilitate permitting under the California Endangered Species Act for RCIS focal species which are state listed, and non-focal species whose conservation need is analyzed or otherwise provided for in this Santa Clara County RCIS. As described in CFGC 1856(c), credits created through an MCA "may be used to fulfill, in whole or in part, compensatory mitigation requirements established under any state or federal environmental law, as determined by the applicable local, state, or federal regulatory agency," including the California Environmental Quality Act (CEQA), and Lake or Streambed Alteration requirements of the CFGC. This also applies to non-focal species of interest, particularly in the context of CEQA. If the non-focal species is aligned with a focal species or other conservation element in this RCIS, and the conservation or habitat enhancement actions would benefit the non-focal species, than those species could be included in an MCA as well (Section 2.2.6, *Non-focal Species*). An MCA can also be used to meet the requirements of federal environmental laws and regulations with the approval of applicable federal regulatory agencies. Appendix B, *Regulatory Processes*, outlines how other regulatory agencies and local CEQA lead agencies may use this RCIS to facilitate mitigation under their respective authorities.

4.4.2.1 Developing Mitigation Credit Agreements

MCAs identify the types and amounts of mitigation credits that will be created through implementation of conservation actions and habitat enhancement actions and provide a schedule for their release based on relevant milestones in project implementation (e.g., land protection, restoration goal achievement). Mitigation credits can be proposed for any conservation action or habitat enhancement action that contributes to the achievement of conservation goals and objectives outlined in this Santa Clara County RCIS. According to 1856(g)(4), once the MCA sponsor demonstrates to CDFW that the performance-based milestones for credit release have been met, CDFW shall determine whether the milestones have been met and credits may be released.

Typically, mitigation credits will be established for the following types of conservation actions and habitat enhancement actions.

- Acquisition of land development rights to *permanently protect*[3] that land.
- Restoration of resources that creates new and/or increases existing habitat functions for a focal species, non-focal species or other conservation element whose conservation need is analyzed or otherwise provided for in this Santa Clara County RCIS.
- Enhancement of focal species' habitat or non-focal species' habitat or other conservation element whose conservation need is analyzed or otherwise provided for in this RCIS.

More information on the MCA development and approval process can be found on the CDFW website for the RCIS program.[4]

4.4.2.2 Mitigation Credit Agreements and the Santa Clara Valley Habitat Plan

CFGC 1856(j) states that "The creation of mitigation credits pursuant to this section from a conservation action or habitat enhancement action implemented within the plan area of an approved natural community conservation plan shall not duplicate or replace mitigation requirements set forth in the natural community conservation plan and shall require the advance written approval of the plan's implementing entity. Mitigation credits created pursuant to this section may be used for covered activities under an approved natural community conservation plan only in accordance with the requirements of the plan. Individuals and entities eligible for coverage as a participating special entity under an approved natural community conservation plan may use mitigation credits created pursuant to this section only if the plan's implementing entity declines to extend coverage to the covered activity proposed by the eligible individual or entity."

To comply with CFGC 1856(j), project proponents with an activity or activities that occur within the Santa Clara Valley Habitat Plan's (Habitat Plan's) plan area that may affect a species covered by the Habitat Plan must do the following.

1. Apply for project permits through Habitat Plan's implementing entity (the Habitat Agency) for permitting through the federal Endangered Species Act and the California Endangered Species Act (Appendix B, *Regulatory Processes*).

[3] The Program Guidelines (California Department of Fish and Wildlife 2018) defines permanent protection to mean: (1) recording a conservation easement and (2) providing secure, perpetual funding for management of the land, monitoring, legal enforcement, and defense.

[4] https://www.wildlife.ca.gov/Conservation/Planning/Regional-Conservation

2. A project proponent that is eligible for coverage as a participating special entity under the Habitat Plan may use mitigation credits created through this Santa Clara County RCIS only if the Habitat Agency declines to extend coverage to the covered activity proposed by that eligible individual or entity.

A project proponent must receive advance written approval from the Habitat Agency before using mitigation credits created through an MCA for covered activities under the Habitat Plan and the mitigation credits may only be used in accordance with the requirements of the Habitat Plan.

A Memorandum of Understanding between the Authority and the Habitat Agency describing commitments to coordinate and collaborate between the two agencies on this RCIS, and the role the Habitat Agency will have in reviewing and approving MCAs, among other aspects, is included in Appendix D, *Letters of Support*.

4.5 Conservation or Mitigation Banks

A conservation or mitigation bank is privately or publicly owned land that is managed for its natural resource values, with an emphasis on the targeted resource (species or aquatic resources, respectively). Overseeing agencies typically require that the establishment of a mitigation bank include the restoration or creation of aquatic resources. Conservation banks may include restoration projects, but they are more heavily focused on the protection and management of existing occupied habitats of the target species. In exchange for permanently protecting and managing the land—and in the case of mitigation banks, restoring or creating aquatic resources—the bank operator is allowed to sell credits to project proponents who need to satisfy legal requirements for compensating environmental impacts of development projects.

The goals of private mitigation banks are compatible with and support regional conservation strategies such as this Santa Clara County RCIS. See Section 2.2.1.3, *Conservation and Mitigation Banks*, for information on the conservation and mitigation banks with available credits whose service area overlaps the RCIS area.

Private parties wishing to develop and establish a new mitigation or conservation bank in the RCIS area should consult guidance and instructions provided by CDFW and the U.S. Fish and Wildlife Service.[5] The Santa Clara County RCIS can provide guidance on where mitigation or conservation banks could be established to support focal species.

4.6 In-Lieu Fee Programs

In-lieu fee programs are identified by 33 Code of Federal Regulations (CFR) 332, Compensatory Mitigation for Losses of Aquatic Resources (also known as the Mitigation Rule), as a preferred approach to meeting compensatory mitigation needs for adverse effects on waters of the United

[5] For additional information on banking see the following websites: < https://www.wildlife.ca.gov/Conservation/Planning/Banking > and <www.fws.gov/sacramento/es/cons_bank.htm>.

States, second to mitigation banks. As defined in 33 CFR 332.2, an *in-lieu fee program* involves the following.

> …the restoration, establishment, enhancement, and/or preservation of aquatic resources through funds paid to a governmental or non-profit natural resources management entity to satisfy compensatory mitigation requirements for DA [Department of the Army] permits. Similar to a mitigation bank, an in-lieu fee program sells compensatory mitigation credits to permittees whose obligation to provide compensatory mitigation is then transferred to the in-lieu program sponsor. However, the rules governing the operation and use of in-lieu fee programs are somewhat different from the rules governing operation and use of mitigation banks. The operation and use of an in-lieu fee program are governed by an in-lieu fee program instrument.

No mitigation lands associated with an in-lieu fee program currently exist in the RCIS area. However, in January 2016, the U.S. Army Corps of Engineers, San Francisco District issued a Regional General Permit (RGP) to the Habitat Agency and its co-permittees, for impacts on waters of the United States associated with many projects and activities covered by the Habitat Plan. This 5-year renewable permit provides a framework for integrating and streamlining waters permitting under Section 404 of the Clean Water Act with the endangered species permitting already in place under the Habitat Plan. This RCIS can be used to inform siting of mitigation lands for use in an in-lieu fee program.

The Habitat Agency is pursuing an in-lieu fee program with the U.S. Army Corps of Engineers-led Interagency Review Team to ensure that mitigation fees paid to the Habitat Plan will fulfill waters mitigation requirements under Section 404. The In-Lieu Fee program may also provide waters mitigation requirements under Section 401 and the Porter-Cologne Water Quality Control Act as regulated by the Regional Water Quality Control Boards. The Habitat Agency is seeking an In-Lieu Fee Program that could provide waters mitigation requirements for all activities covered by the Habitat Plan, not only those also covered by the RGP.

4.7 Extending and Amending the RCIS

CDFW may extend the duration of an approved or amended RCIS for additional periods of up to 10 years. If the Authority or other entities intend to use this RCIS to create additional mitigation credits pursuant to CFGC section 1856 after the RCIS approval period ends, the Authority, CDFW,[6] or other entity, with permission from the RCIS proponent, shall update the scientific information in this RCIS at least once every 10 years. Once the Santa Clara County RCIS is updated with new scientific information and CDFW finds that the RCIS continues to meet the requirements of CFGC 1852, CDFW may extend the duration of this RCIS.

Additionally, CDFW may amend the RCIS through the amendment process described in CFGC 1854 (a). CFGC 1854 (a) states, "For purposes of this section, an amended strategy means a complete regional conservation investment strategy prepared by a public agency to amend substantially and to replace an approved strategy submitted by the public agency."

[6] According to the Program Guidelines (California Department of Fish and Wildlife 2018): "If CDFW determines that an approved RCIS needs to be updated or evaluated more frequently and the RCIS proponent or responsible party declines to do so, MCA sponsors or CDFW may elect to update the RCIS. Any such updates shall become part of the approved RCIS, pending an evaluation by CDFW."

The process and timelines for amending an existing RCIS are the same as for developing a new RCIS, including requirements for public outreach and CDFW review and approval. An RCIS may be amended for a variety of reasons, which may include one or more of the following.

- Changing the RCIS area.
- Adding or removing focal species.
- Substantially changing the conservation goals and objectives of focal species.
- Substantial advancement in the best available science on which the conservation goals and objectives are based (e.g., climate change projections).

Chapter 5
References

5.1 Chapter 1

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5.3 Chapter 3

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Chapter 6
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Appendix A

Glossary

Appendix A
Glossary

This glossary defines terms that are used throughout this Santa Clara County RCIS. Additional terms are provided in the *Regional Conservation Investment Strategies Program Guidelines* (Program Guidelines), Section 2.1, *Terms, Abbreviations, Acronyms, and Definitions* (California Department of Fish and Wildlife 2018).

Terms and Definitions

Term	Definitions
adaptive management and monitoring strategy	A component of an RCIS that incorporates an adaptive management process that is informed by periodic monitoring of the implementation of both conservation actions and habitat enhancement actions.[1] Adaptive management means using the results of new information gathered through a monitoring program to adjust management strategies and practices to help provide for the conservation of focal species and their habitats. A monitoring strategy is the periodic evaluation of monitoring results to assess the adequacy of implementing a conservation action or habitat enhancement action and to provide information to direct adaptive management activities to determine the status of the focal species, their habitats, or other natural resources.[2]
administrative draft NCCP	A substantially complete draft of a Natural Community Conservation Plan (NCCP) that is released after January 1, 2016, to the general public, plan participants, and CDFW.
advance mitigation	Compensatory mitigation for impacts on ecological resources (species and their habitat) and other natural resources that is implemented prior to impacts occurring.
Assembly Bill 2087	Amended CFGC Chapter 9, Sections 1850–1861 to create the California Department of Fish and Wildlife's RCIS program (Program). The Program encourages public agencies to develop RCISs, using the best available science to identify regional conservation priorities and other actions to help California's vulnerable species populations. The Program provides additional tools and mechanisms to complement and enhance existing programs and increase options for project proponents, including public infrastructure agencies, to create compensatory mitigation that supports regional conservation priorities in advance of impacts.

[1] Fish & G. Code, § 1856, subdivisions (b)(1) and (f)(14)

[2] Adapted from Fish and Game Code section 2805, subdivisions (a) and (g).

Term	Definitions
Bay Area RAMP Technical Advisory Committee	A committee comprised of state and federal agencies, three Congestion Management Agencies (Contra Costa Transportation Authority, Solano Transportation Authority, and Santa Clara Valley Transportation Authority), the East Contra Costa County Habitat Conservation Plan/Natural Communities Conservation Plan Conservancy, and the Santa Clara Valley Habitat Agency. The Bay Area RAMP Technical Advisory Committee provided feedback on technical issues and draft elements of the RCIS planning process.
biodiversity	The full array of living things considered at all levels, from genetic variants of a single species to arrays of species and arrays of genera, families, and higher taxonomic levels; includes natural communities and ecosystems.
California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California	A statewide assessment[3] of essential habitat connectivity completed by consultants and commissioned by CDFW and Caltrans; the assessment used the best available science, data sets, and spatial analysis and modeling techniques to identify large remaining blocks of intact habitat or natural landscape and model linkages between them that need to be maintained, particularly as corridors for wildlife.
California Fish and Game Code (CFGC)	State code amended by Assembly Bill 2087 to provide for a regional RCIS program (CFGC 1850–1861).
California State Coastal Conservancy (Coastal Conservancy)	The state agency sponsoring this Santa Clara County RCIS (RCIS state agency sponsor).
California Wildlife Habitat Relationships - CWHR	System that contains the life history, geographic range, habitat relationships, and management information for more than 700 regularly occurring species of amphibians, reptiles, birds, and mammals in the state. It can generate lists of species by geographic location or habitat type and provides information on expert opinion–based habitat suitability ranks for each species within each habitat type (California Department of Fish and Wildlife 2017).
climate change vulnerability	Refers to the degree to which an ecological system, natural community, habitat, or individual species is likely to be adversely affected as a result of changes in climate and is often dependent on factors such as exposure, sensitivity, and adaptive capacity.
compensatory mitigation	Actions taken to fulfill, in whole or in part, mitigation requirements under state or federal law or a court mandate.
conservation, conserve	The use of habitat and other natural resources in ways such that they may remain viable for future generations. This includes permanent protection of such resources. *See permanently protect*.

[3] *California Essential Habitat Connectivity Project*. Available: https://www.wildlife.ca.gov/conservation/planning/connectivity/CEHC.

Term	Definitions
conservation action	An action identified in an RCIS that, when implemented, would permanently protect or restore, and perpetually manage, conservation elements, including focal species and their habitats, natural communities, ecological processes, and wildlife corridors. In contrast, a habitat enhancement action would have long-term durability but would not involve acquiring land or permanently protecting habitat – see habitat enhancement action. A conservation action is developed to achieve one or more conservation objectives. A conservation action may be implemented through a variety of conservation investments or MCAs. A conservation action that is implemented through an MCA would create conservation credits to be used as compensatory mitigation.
conservation bank	Permanently protected land managed for its natural resource values, with an emphasis on targeted resources. May include habitat restoration or creation in addition to protecting federally or state listed species and their habitats.[4] See *mitigation bank.*
conservation easement	A perpetual conservation easement that complies with Chapter 4 (commencing with Section 815) of Title 2 of Part 2 of Division 2 of the Civil Code.[5]
conservation element	An element that is identified and analyzed in an RCIS that will benefit from conservation actions and habitat enhancement actions set forth in the RCIS. Conservation elements include focal species and their habitats, natural communities, biodiversity, habitat connectivity, ecosystem functions, water resources, and other natural resources. Conservation elements may benefit through both conservation investments and MCAs.
conservation goal	Broad, guiding principle that describes a desired future condition for a focal species, other species, or other conservation element. Each conservation goal is supported by one or more conservation objectives.
conservation investment	Conservation actions or habitat enhancement actions that are implemented under an approved RCIS, but the implementer does not create credits through an MCA with CDFW. Conservation investments are typically funded by public agencies and nonprofit or other philanthropic organizations.
Conservation Partners	A group of representatives of conservation agencies and organizations and public infrastructure agencies established by the Steering Committee to obtain data and input necessary to ensure that this Santa Clara County RCIS will be effective, and to increase capacity and support for its long-term implementation. The Conservation Partners include conservation organizations, resource agencies and public infrastructure agencies.
conservation planning unit (CPU)	A discrete geographic unit of conservation based on HUC 10 watershed boundaries. The CPU focuses conservation actions in a spatially explicit manner.

[4] https://www.wildlife.ca.gov/Conservation/Planning/Banking

[5] *Conservation easement* includes a conservation easement as defined in Civil Code section 815.1 and an agricultural conservation easement as defined in Pub. Resources Code, § 10211.

Term	Definitions
conservation priority	A conservation or habitat enhancement action (e.g., land acquisition, restoration, or habitat enhancement) that is identified based on its importance for benefiting and contributing to the conservation of focal species and their habitats, or other conservation elements within an RCIS area.
conservation purpose	Statement or statements in an RCIS that identify focal species and other conservation elements within the RCIS area and which outline conservation actions or habitat enhancement actions that, if implemented, will sustain and restore these resources.
conservation strategy	The strategy for restoring viability of focal species. Comprises four elements: conservation goals, conservation objectives, conservation actions, and conservation priorities.
creation (of natural community or focal species' habitat)	The creation of a specified resource condition where none existed before. Also see *establishment.*
critical habitat	Habitat designated as critical[6] refers to specific areas occupied by a federally-listed species at the time it is listed, and that are essential to the conservation of the species and that may require special management considerations or protection. Critical habitat also includes specific areas outside occupied habitat into which the species could spread and that are considered essential for recovery of the species.
distinct population segment	A subdivision of a vertebrate species that is treated as a species for purposes of listing under the Endangered Species Act (ESA). Based on FWS and NMFS "Policy Regarding the Recognition of Distinct Vertebrate Population Segments under the Endangered Species Act" (61 FR 4722; February 7, 1996), two elements are considered in determining whether there is a distinct population segment: (1) discreteness of the population segment in relation to the remainder of the species to which it belongs; and (2) the significance of the population segment to the species to which it belongs.
ecological function	Ecological function refers to the roles and relationships (e.g., predator and prey relationships) of organisms within an ecological system, and the processes (e.g., pollination, decomposition) that sustain an ecological system. See also, *ecosystem function.*
ecological resources	Species, habitat, biological resources, and natural resources identified in an RCA or RCIS. Also see *conservation element* and *natural resources*.
ecoregion, sub-ecoregion	As used in this document, ecoregion means a USDA Section (Goudey and Smith 1994) and sub-ecoregion means a portion of the USDA Section or USGS Hydrological Units (assigned hydrological unit codes; HUC).[7] The U.S. Department of Agriculture (USDA) describes four geographic levels of detail in a hierarchy of regional ecosystems including domains, divisions, provinces, and sections. Sections are subdivisions of provinces based on major terrain features, such as a desert, plateau, valley, mountain range, or a combination thereof.

[6] 16 U.S.C. § 1532(5)(a)

[7] The United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS), the United

Term	Definitions
ecosystem	A natural unit defined by both its living and non-living components; a balanced system of the exchange of nutrients and energy. See *habitat*.
ecosystem function	The ecosystem processes involving interactions between physical, chemical, and biological components, such as dynamic river meander, floodplain dynamism, tidal flux, bank erosion, and other processes necessary to sustain the ecosystem and the species that depend on it.
ecosystem services	The beneficial outcomes to humans from ecosystem functions such as supplying of oxygen; sequestering of carbon; moderating climate change effects; supporting the food chain; harvesting of animals or plants; providing clean water; recharging groundwater; abating storm, fire, and flood damage; pollinating and fertilizing for agriculture; and providing scenic views.
endemic	A species, subspecies, or variety found only in a specified geographic region.
enhancement	A manipulation of an ecological resource or natural resource that improves a specific ecosystem function. An enhancement does not result in a gain in protected or conserved land, but it does result in an improvement in ecological or ecosystem function.
essential connectivity areas	Those areas essential for ecological connectivity between natural landscape blocks, as depicted in the Essential Connectivity Map prepared as part of CEHC Project[8], or other connectivity report, plan, or map approved by CDFW or that represents best available science.
establishment	The manipulation of the physical, chemical, or biological characteristics present on a site to develop an aquatic or terrestrial habitat resource for focal species. Establishment will result in a gain in resource area and/or function. Also, see *creation*.
focal species	Sensitive species that are identified and analyzed in an RCIS and will benefit from conservation actions and habitat enhancement actions set forth in the RCIS. Focal species may benefit through both conservation investments and MCAs. See also, *sensitive species*, *special-status species*, and *non-focal species*.
gap analysis	An analysis that identifies gaps between land areas that are rich in biodiversity and areas that are managed for conservation.
habitat	An ecological or environmental area that is, or may be, inhabited by a species of animal, plant or other type of organism. It is also the physical and biological environment that surrounds, influences, and is utilized by a species' population and is required to support its occupancy.
habitat connectivity	The capacity of habitat to facilitate the movement of species and ecological functions.

States Geological Survey (USGS), and the Environmental Protection Agency (EPA). The Watershed Boundary Dataset (WBD) was created from a variety of sources from each state and aggregated into a standard national layer for use in strategic planning and accountability. Available: http://datagateway.nrcs.usda.gov

[8] California Essential Habitat Connectivity Project. Available: https://www.wildlife.ca.gov/conservation/planning/connectivity/CEHC.

Term	Definitions
habitat enhancement action	An action identified in an RCIS that, when implemented, is intended to improve the quality of wildlife habitat, or to address risks or stressors to wildlife. A habitat enhancement action is developed to achieve one or more conservation objectives. A habitat enhancement action would have long-term durability but would not involve acquiring land or permanently protecting habitat. In contrast, a conservation action would permanently protect or restore, and perpetually manage, conservation elements – see Conservation Action. Examples of habitat enhancement actions include improving in-stream flows to benefit fish species, enhancing habitat connectivity, and controlling or eradicating invasive species. A habitat enhancement action may be implemented through a variety of conservation investments or MCAs. A habitat enhancement action that is implemented through an MCA would create habitat enhancement credits intended for use as compensatory mitigation for temporary impacts.[9]
habitat conservation plan (HCP)	Habitat Conservation Plan. A planning document that is required as part of an application for an incidental take permit under the federal Endangered Species Act. HCPs provide for partnerships with non-federal parties to conserve the ecosystems upon which listed species depend, ultimately contributing to their recovery. HCPs describe the anticipated effects of the proposed taking, how those impacts will be minimized or mitigated, and how the HCP is to be funded.[10]
Hydrologic Unit Code (HUC)	A code identifying a unique hydrologic unit.[11]
Implementing Entity	The organization designated in an NCCP and associated Implementing Agreement that is responsible for implementing the NCCP. Implementing Entities can be non-profit organizations, joint-powers authorities, local governments (such as cities or counties), or others.
in-lieu fee program	An agreement between a regulatory agency or agencies (state, federal, or local) and a single sponsor which must be a public agency or non-profit organization. Under an in-lieu-fee agreement, the mitigation sponsor collects funds from permittees in lieu of providing permittee-responsible compensatory mitigation required under the U.S. Army Corps of Engineers or a state or local aquatic resource regulatory program. The sponsor uses the funds pooled from multiple permittees to create one or more sites under the authority of the agreement to compensate for aquatic resource functions lost as a result of the permits issued.

[9] Fish & G. Code, § 1856, subdivision (d) states that "…the habitat enhancement action shall remain in effect at least until the site of the environmental impact is returned to pre-impact ecological conditions."

[10] https://www.fws.gov/endangered/esa-library/pdf/hcp.pdf

[11] The United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS), the United States Geological Survey (USGS), and the Environmental Protection Agency (EPA). The Watershed Boundary Dataset (WBD) was created from a variety of sources from each state and aggregated into a standard national layer for use in strategic planning and accountability. Available: http://datagateway.nrcs.usda.gov.

Term	Definitions
indicator species	A species, the presence or absence of which is indicative of a particular habitat, community, or set of environmental conditions (Lincoln et al. 1998).
invasive species	Invasive species means, with regard to a particular ecosystem, a non-native organism whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health.[12] Also see *non-native species*.
keystone species	A species whose impacts on its community or ecosystem are much larger than would be expected from its abundance or a species whose loss from an ecosystem would cause a greater-than-average change in other species populations or ecosystem processes and whose continued well-being is vital for the functioning of a whole community (Groom et al 2006).
land conversion	The conversion of natural and agricultural land to other land uses through the process of development.
land cover type	The dominant feature of the land surface discernible from aerial photographs and defined by vegetation, water, or human uses.
mitigation bank	Permanently protected land managed for its natural resource values, with an emphasis on federally or state listed species and their habitats. Typically requires the restoration or creation of aquatic resources.[13] See *conservation bank*.
mitigation credit agreement (MCA)	An agreement between CDFW and one or more persons or entities that identifies the types and numbers of credits the person(s) or entity(ies) proposes to create by implementing one or more conservation actions or habitat enhancement actions. An MCA includes the terms and conditions under which those credits may be used. The person or entity may create and use, sell, or otherwise transfer the credits upon CDFW's approval that the credits have been created in accordance with the MCA. To enter into an MCA with CDFW, a person or entity shall submit a draft MCA to CDFW for its review, revision, and approval. An MCA may only be created within an area where an RCIS has been approved.

[12] Obama, Barack – the White House, Executive Order -- Safeguarding the Nation from the Impacts of Invasive Species. December 5, 2016. Available: https://obamawhitehouse.archives.gov/the-pressoffice/ 2016/12/05/executive-order-safeguarding-nation-impacts-invasive-species.

[13] https://www.wildlife.ca.gov/Conservation/Planning/Banking

Term	Definitions
natural community	A group of organisms living together and linked together by their effects on one another and their responses to the environment they share (Sawyer et el. 2009). A general term often used synonymously with vegetation community and aquatic community.
Natural Community Conservation Plan (NCCP)	A plan developed pursuant to the Natural Community Conservation Planning Act (Fish and Game Code sections 2800-2835) which identifies and provides for the regional protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity.[14] An NCCP allows for take of species listed under CESA, as well as other, non-listed species.
natural resources	Biological and ecological resources including species and their habitats, Waters of the State, Waters of the United States, wetlands, and natural communities. See *ecological resources* and *conservation element*.
non-focal species	Species that are not "focal species", as defined in these Guidelines, but which are associated with a focal species or other conservation element and will benefit from conservation actions and habitat enhancement actions set forth in the RCIS. Non-focal species may benefit through both conservation investments and MCAs. See also, *focal species*, *sensitive species*, and *special-status species*.
non-native species	Any species introduced to California after European contact and as a direct or indirect result of human activity (California Invasive Plant Council 2006). See *invasive species*.
objective	A concise, measurable statement of what is to be achieved and that supports a conservation goal. The objective should be based on the best available scientific information to conserve the focal species or other conservation elements for which the conservation goal and objective is developed. It should be measurable by using a standard metric or scale (i.e., number, percent), in a region (e.g., county, watershed, jurisdictional area) over a period of time (e.g., years).
permanently protect	Permanent protection means: (1) recording a conservation easement and (2) providing secure, perpetual funding for management of the land, monitoring, legal enforcement, and defense.
Plan Bay Area 2040	A long-range integrated transportation and land-use/housing strategy through 2040 for the San Francisco Bay Area. Meets the requirements of Senate Bill 375, which requires development of a sustainable communities strategy to accommodate future population growth and reduce greenhouse gas emissions from cars and light trucks (Metropolitan Transportation Commission 2013).
population	The number of individuals of a particular taxon inhabiting a defined geographic area.
pressure	See *stressor, pressure*.
protected area	Public or private lands protected through legal or other effective means, where the primary intent of land management is to manage the land for open space use and habitat.
RCIS area	The geographic area encompassed by an RCIS.

[14] Fish & G. Code, §§ 2800 – 2835

Term	Definitions
RCIS proponent	The public agency or group of public agencies developing an RCIS for review and approval by CDFW and who is responsible for the technical and administrative updates of an RCIS.
recovery	The process by which the decline of an endangered or threatened species is halted or reversed or threats to its survival are neutralized, so that its long-term survival in nature can be ensured. Recovery entails actions to achieve the conservation and survival of a species (U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998), including actions to prevent any further erosion of a population's viability and genetic integrity. Recovery also includes actions to restore or establish environmental conditions that enable a species to persist (i.e., the long-term occurrence of a species through the full range of environmental variation).
recovery area	Area identified in a draft or approved recovery plan for a federally listed species.
recovery goal	An established goal, usually quantitative, in a recovery plan that identifies when a listed species is restored to a point at which the protections of the federal Endangered Species Act or California Endangered Species Act are no longer required.
recovery plan	A document published by USFWS, NMFS, or CDFW that lists the status of a listed species and the actions necessary to remove the species from the endangered species list.
Regional Advance Mitigation Planning (RAMP)	A comprehensive approach to mitigating unavoidable biological resource impacts potentially caused by infrastructure projects, such as roads and levees, before infrastructure projects are constructed. Initiated in 2008 by a coalition of infrastructure agencies, natural resource agencies, nongovernmental organizations, and academic researchers.[15]
regional conservation investment strategy (RCIS)	Information and analyses to inform nonbinding and voluntary conservation actions and habitat enhancement actions that would advance the conservation of focal species and their habitats, natural communities, and other conservation elements. The RCIS provides nonbinding, voluntary guidance for the identification of conservation priorities, investments in ecological resource conservation, or identification of priority locations for compensatory mitigation for impacts on species and natural resources. RCISs are intended to provide scientific information for the consideration of public agencies and are voluntary. RCISs do not create, modify, or impose regulatory requirements or standards, regulate the use of land, establish land use designations, or affect the land use authority of, or exercise of discretion by, any public agency. RCISs are required if MCAs are to be developed.
Regional Conservation Investment Strategies Program Guidelines (Program Guidelines)	Guidelines for regional conservation investment strategies, published in support of Assembly Bill 2087 (California Department of Fish and Wildlife 2018).

[15] http://www.water.ca.gov/conservationstrategy/cs_ramp.cfm

Term	Definitions
rehabilitation	Manipulation of a piece of land with the goal of repairing natural or historic ecosystem functions to degraded habitat or natural resources. This results in an improvement in ecological or ecosystem functions, but it does not result in a gain in area.
restore, restoration	Manipulation of a site with the goal of returning species, habitat, and ecological and ecosystem functions to a site that historically supported such species, habitat, and functions, but which no longer supports them due to the loss of one or more required ecological factors or as a result of past disturbance. Compare with *conservation*, *preserve*, and *rehabilitation*.
sensitive species	Any special-status species identified by a state or federal agency. See also, *focal species* and *special-status species*.
special-status species	For the purpose of the Program, a species identified as endangered, threatened, or candidate under state or federal law; as rare or fully protected under state law; or otherwise identified by CDFW through the approval of an RCIS. See also, *focal species* and *sensitive species*.
Species of Greatest Conservation Need (SGCN)	Species of Greatest Conservation Need are selected, for each state, to indicate the status of biological diversity in the state, specifying at-risk species that have the greatest need for conservation. The latest SGCN list for the state of California is found in the California State Wildlife Action Plan 2015 Update (California Department of Fish and Wildlife 2015).
Species of Special Concern (SSC)	Species of Special Concern[16] is an administrative designation and carries no formal legal status. The intent of designating SSCs is to: 1) focus attention on animals considered potentially at conservation risk by CDFW, other state, local and federal governmental entities, regulators, land managers, planners, consulting biologists, and others; 2) stimulate research on poorly known species; and 3) achieve conservation and recovery of these animals before they meet CESA criteria for listing as threatened or endangered.
Steering Committee	Representatives from the Santa Clara Valley Open Space Authority, Santa Clara Valley Habitat Agency, Santa Clara Valley Transportation Authority, The Nature Conservancy, and the State Coastal Conservancy responsible for coordinating and developing this Santa Clara County RCIS.
strategy term	The initial 10-year period of RCIS approval. May be extended by CDFW after review.
stressor, pressure	Stressor is a degraded ecological condition of a focal species or other conservation element that resulted directly or indirectly from a negative impact of pressures such as habitat fragmentation. A pressure is an anthropogenic (human-induced) or natural driver that could result in changing the ecological conditions of a focal species or other conservation element. Pressures can be positive or negative depending on intensity, timing, and duration. Negative or positive, the influence of a pressure to the target focal species or other conservation elements is likely to be significant.

[16] https://www.wildlife.ca.gov/Conservation/SSC

Term	Definitions
State Wildlife Action Plan (SWAP)	The California State Wildlife Action Plan (SWAP) is a CDFW publication developed to address the highest conservation priorities of the state, providing a blueprint for actions necessary to sustain the integrity of California's diverse ecosystems.[17] CDFW also created companion plans to support SWAP 2015 implementation through collaboration with partner agencies and organizations. The companion plans identify shared priorities among partner organizations to conserve natural resources in nine sectors that are experiencing significant pressures affecting natural resources (California Department of Fish and Wildlife 2015).[18]
subregional assessment	Geographically specific plans that assess expected habitat mitigation demands over a defined period of time and identify possible mitigation approaches in advance of any impacts.
Technical Advisory Committee (TAC)	The group of technical specialists convened to review and comment on drafts of the RCIS during development.
watershed	An area or ridge of land that contains a common set of streams and rivers that all drain into one location such as a marsh, stream, river, lake, or ocean.
working land	An area where people live and work in a way that allows ecosystems or ecosystem functions to be sustained (e.g., farms, ranches). Human activities are done in a way that minimizes disturbance on native plants and animals while still retaining the working nature of the landscape.

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[17] https://www.wildlife.ca.gov/SWAP/Final
[18] https://www.wildlife.ca.gov/SWAP/Final/Companion-Plans

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Appendix B

Regulatory Processes

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Regulatory Processes

This Santa Clara County Regional Conservation Investment Strategy (RCIS) is designed to inform implementation of conservation actions and conservation enhancements, including those conducted as mitigation. When undertaking any type of ground-disturbing or vegetation-manipulating activities, it is important to consider that the action taken may affect resources regulated by one or more agency and may require one or more regulatory permits. This appendix provides a brief overview of the permitting agencies and key regulations that may require mitigation that can be informed by this RCIS. This appendix also provides a brief overview of the Santa Clara Valley Habitat Plan (a Habitat Conservation Plan [HCP]/Natural Community Conservation Plan [NCCP]), an existing permitting program that overlaps approximately 54% of the RCIS area.

When developing permit applications to these agencies, a key consideration is whether the proposed project falls under an existing permitting program or regional program for compensatory mitigation. In addition, it is important to consider how this RCIS and other existing permitting programs are applicable to the different regulatory agencies that may have purview over the project. This appendix is designed to provide guidance related to established programs and guidance on how the information in this Santa Clara County RCIS can be used to support mitigation requirements of different regulatory agencies.

Regulatory Overview

The following sections provide a high-level overview of the regulatory agencies typically involved in project permitting where the proposed activity may disturb aquatic resources and species addressed by the federal Endangered Species Act (ESA) and the California Endangered Species Act (CESA). This overview is not comprehensive, and other permits from other agencies or local jurisdictions may be required. The purpose of this overview is to provide basic guidance on regulations that may relate to proposed projects.

U.S. Army Corps of Engineers

Under Section 404 of the federal Clean Water Act (CWA), a permit is required from the U.S. Army Corps of Engineers (Corps) for the placement of dredged or fill material into waters of the United States, including wetlands. Projects may be authorized under existing general permits (nationwide permits or regional general permits) or may require an individual permit. A nationwide permit is a more streamlined permit process than an individual permit, although supporting compliance efforts, such as for the ESA and National Historic Preservation Act, are similar regardless of permit type. Project activities that could trigger CWA Section 404 permitting (individual or general) include temporarily or permanently filling any portion of a water of the United States.

U.S. Fish and Wildlife Service and National Marine Fisheries Service

U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) administer the federal ESA. The ESA requires these agencies to maintain lists of threatened and endangered species and affords substantial protection to listed species. NMFS's jurisdiction under ESA is limited to the protection of marine mammals, marine fishes, and anadromous fishes;[1] all other species are subject to USFWS jurisdiction. The ESA includes mechanisms that provide exceptions to the Section 9[2] take prohibitions. These are addressed in ESA Section 7 for federal actions and ESA Section 10 for nonfederal actions.

Endangered Species Act Section 7

Section 7 of the ESA requires all federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of habitat critical to such species' survival. To ensure that its actions do not result in jeopardy to listed species or in the adverse modification of critical habitat,[3] each federal agency must consult with USFWS and/or NMFS regarding federal agency actions that may affect listed species regulated by the respective agencies. Consultation begins when the federal agency (often the Corps) submits a written request for initiation to USFWS or NMFS, along with the agency's biological assessment of its proposed action, and when USFWS or NMFS accepts that biological assessment as complete. If USFWS or NMFS concludes that the action is not likely to adversely affect a listed species, the action may be conducted without further review under the ESA. Otherwise, USFWS or NMFS must prepare a written biological opinion describing how the agency's action will affect the listed species and its critical habitat.

If the biological opinion concludes that the proposed action would jeopardize the continued existence of a listed species or adversely modify its critical habitat, the opinion will suggest "reasonable and prudent alternatives" that would avoid that result. If the biological opinion concludes that the proposed action would take a listed species but would not jeopardize its continued existence, the biological opinion will include an incidental take statement. *Incidental take* is take that is "incidental to, and not intended as part of, an otherwise lawful activity."[4] The incidental take statement specifies an amount of take that is allowed as a result of the action and whether reasonable and prudent measures may be required to minimize the impact of the take.

Endangered Species Act Section 10

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

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

[2] https://www.fws.gov/endangered/laws-policies/section-9.html

[3] *Critical habitat* is defined as specific geographic areas, whether occupied by listed species or not, that are determined to be essential for the conservation and management of listed species, and that have been formally described in the *Federal Register*.

[4] 64 CFR 60728

HCP, and the HCP's planning process, is to ensure that the effects of the authorized incidental take is adequately minimized and mitigated (U.S. Fish and Wildlife Service 2005).

The take prohibition for listed plants is more limited than for listed fish and wildlife. Under Section 9(a)(2)(B) of the ESA, endangered plants are protected from "removal, reduction to possession, and malicious damage or destruction" in areas that are under federal jurisdiction. Section 9(a)(2)(B) of the ESA also provides protection to plants from removal, cutting, digging up, damage, or destruction where the action takes place in violation of any state law or regulation or in violation of a state criminal trespass law. Thus, the ESA does not prohibit the incidental take of federally listed plants on private or other nonfederal lands unless the action requires federal authorization or is in violation of state law. Although Section 10 incidental take permits are only required for wildlife and fish species, the Section 7(a)(2) prohibition against jeopardy applies to plants, and issuance of a Section 10(a)(1)(B) incidental take permit cannot result in jeopardy to a listed plant species.

California Department of Fish and Wildlife

California Endangered Species Act

The CESA prohibits take of wildlife and plants listed as threatened or endangered by the California Fish and Game Commission. *Take* is defined under the California Fish and Game Code (CFGC) (more narrowly than under the ESA) as any action or attempt to "hunt, pursue, catch, capture, or kill."

Like the ESA, the CESA allows exceptions to the prohibition for take that occurs during otherwise lawful activities. The requirements of an application for an incidental take permit under CESA are described in CFGC 2081(b). Incidental take of state-listed species may be authorized if an applicant submits an approved plan that meets all of the requirements of CFGC 2081(b), including that it minimizes and "fully mitigates" the impacts of this take.

Natural Community Conservation Planning Act

In 1991, California's Natural Community Conservation Planning Act (NCCP Act)[5] was enacted to implement broad-based planning that balances appropriate development and growth with conservation of wildlife and habitat. Pursuant to the NCCP Act, local, state, and federal agencies are encouraged to prepare NCCPs to provide comprehensive management and conservation of multiple species and their habitats under a single plan, rather than through preparation of numerous individual plans on a project-by-project basis. The NCCP Act is broader in its orientation and objectives than are the ESA and the CESA. Preparation of an NCCP is voluntary. The primary objective of the NCCP Act is to conserve natural communities at the ecosystem scale while accommodating compatible land use. To be approved by the California Department of Fish and Wildlife (CDFW), an NCCP must provide for the conservation of species and protection and management of natural communities in perpetuity within the area covered by permits. *Conservation* is defined by CFGC 2805(d). Thus, NCCPs must contribute to the recovery of listed species or prevent the listing of non-listed species rather than just mitigate the effects of covered activities. This recovery standard is one of the major differences between an NCCP and an HCP prepared to satisfy ESA or an ITP to satisfy CESA.

The 1991 NCCP Act was replaced with a substantially revised and expanded NCCP Act in 2002. The revised NCCP Act established new standards and guidance on many facets of the program, including scientific information, public participation, biological goals, interim project review, and approval criteria. The new NCCP Act took effect on January 1, 2003.

[5] CFGC 2800 *et seq.*

Lake and Streambed Alteration Agreement

A project proponent is required to enter into a lake and streambed alteration agreement with CDFW when a proposed project would substantially divert, obstruct, or change the natural flow of a river, stream, or lake; or substantially change or use material from the bed, channel, or bank of a river, stream, or lake.[6] Through this process, CDFW can impose conditions on a project to ensure that no net loss of wetland values or acreage will be incurred.

Regional Water Quality Control Board

Clean Water Act Section 401 Water Quality Certification

CWA Section 401 requires that applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain water quality certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401. The Regional Water Quality Control Board (RWQCB) cannot provide Section 401 certification until after CEQA review is complete. The Corps will require compliance with Section 401 as a prerequisite to authorization of the project under Section 404.

Although the RWQCB has its own application forms, in practice, the application for Section 401 certification and for issuance or waiver of waste discharge requirements (WDRs) (see below) are combined and can use much of the same information as the CWA Section 404 permit application. For projects occurring within multiple state and federal agency jurisdictions, the Joint Aquatic Resources Permit Application may also be used.

Waste Discharge Requirements

The RWQCBs designate beneficial uses and establish water quality objectives for the state's waters through development of basin plans under the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), federal CWA, and general provisions of California Water Code Section 13000 (California State Water Resources Control Board 2017). The water quality objectives include both quantitative and narrative targets that may differ depending on the specific beneficial uses being protected. Narrative objectives are established for parameters such as color, suspended and settleable material, oil and grease, biostimulatory substances, and toxicity. Numeric objectives can include such parameters as dissolved oxygen levels, temperature, turbidity, pH, and concentrations of specific chemical constituents such as trace metals and synthetic organic compounds.

Under the Porter-Cologne Act, the RWQCB regulates the discharge of waste to waters of the state. All parties proposing to discharge waste that could affect waters of the state must file a report of waste discharge with the local RWQCB, which will then respond by issuing WDRs in a public hearing or by waiving them (with or without conditions).

The terms *discharge of waste* and *waters of the state* are broadly defined in the Porter-Cologne Act such that discharges of waste include fill, any material resulting from human activity, or any other discharge that may directly or indirectly affect waters of the state. While all waters of the United States that are within the borders of California are also waters of the state, the converse is not

[6] CFGC 1602.

true—waters of the United States are more specifically defined, with the result that they are a subset of waters of the state in practice.

Any activity that results or may result in a discharge that directly or indirectly affects waters of the state or the beneficial uses of those waters are subject to WDRs, even if they are not also waters of the United States. Thus, the WDRs are more broadly applicable. The San Francisco Bay Regional Water Quality Control Board (San Francisco Bay Water Board) and the Central Coast Regional Water Quality Control Board (Central Coast Regional Board) have produced a combined application forms for Section 401 certification and waiver of WDRs to ensure that applicants do not need to file both a report of waste discharge and an application for Section 401 certification.

Santa Clara Valley Habitat Plan

The Santa Clara Valley Habitat Plan (Habitat Plan) (ICF International 2012) is the only regional permitting program currently in place in this Santa Clara County RCIS area. The Habitat Plan permit area includes 508,669 acres in Santa Clara County, including areas within the cities of San José, Morgan Hill, and Gilroy. A small portion of the Habitat Plan permit area extends into Alameda and San Mateo Counties, as part of an expanded study area and permit area for burrowing owl conservation.[7] It also includes areas within the county defined by a combination of political, ecological, and hydrologic factors. Watershed boundaries were used to define the inventory area wherever possible.

Most projects in the Habitat Plan permit area—all of which is within the RCIS area except for the portions of the expanded study area for burrowing owl conservation outside of Santa Clara County—will be subject to the Habitat Plan and will use that plan's incidental take species permits (for both state and federal listed species). The Habitat Plan is designed so that project proponents pay a fee to the Santa Clara Valley Habitat Agency to address compensatory mitigation needs, and there is no need to consider further compensatory mitigation needs for the species covered by the Habitat Plan[8], though occasionally projects may require permits for species not covered in the Habitat Plan, including fish. The Habitat Plan also has established a regional general permit with the Corps. The permit allows projects covered by the Habitat Plan to receive an expedited permit from the Corps and to use Habitat Plan fees to address impacts on waters of the United States. This 5-year renewable regional general permit provides a framework for integrating and streamlining waters permitting under Section 404 of the Clean Water Act with the endangered species permitting already in place under the Habitat Plan. The Habitat Agency is pursuing an in-lieu fee program with the U.S. Army Corps of Engineers-led Interagency Review Team to ensure that mitigation fees paid to the Habitat Plan will fulfill waters mitigation requirements under Section 404. The In-Lieu Fee program may also provide waters mitigation requirements under Section 401 and the Porter-Cologne Water Quality Control Act as regulated by the Regional Water Quality Control Boards. The Habitat Agency is seeking an In-Lieu Fee Program that could provide waters mitigation requirements for all activities covered by the Habitat Plan, not only those also covered by the RGP.

This Santa Clara County RCIS is a non-regulatory and voluntary program designed to complement the Habitat Plan. CFGC1856(j) includes requirements for when a mitigation credit agreement (MCA)

[7] The expanded study area for burrowing owl conservation that falls outside of the primary Habitat Plan study area is 48,464 acres. The allowable activities covered by the Habitat Plan in this expanded study area and permit area are limited only to conservation actions for western burrowing owl.

[8] Species covered by the Habitat Plan, or "covered species" are those species addressed in the Habitat Plan for which conservation actions will be implemented and for which the Habitat Plan's Permittees are authorized for take under Section 2835 of the California Natural Community Conservation Planning Act and Section 10 of the federal Endangered Species Act.

may be established within the plan area of an approved NCCP (Section 4.4.2.2, *Mitigation Credit Agreements and the Santa Clara Valley Habitat Plan*).

Water Quality Objectives for Use in Designing and Implementing Projects with Impacts on Creeks or Wetlands

Two RWQCBs have jurisdiction that overlap this Santa Clara County RCIS area: the San Francisco Bay Regional Water Quality Control Board in the northern two-thirds of the RCIS area (north of Morgan Hill) and the Central Coast Regional Water Quality Control Board in the southern third of the RCIS area (south of Morgan Hill). These two water boards are charged with maintaining the beneficial uses of waters of the United States in the San Francisco Bay and Central Coast Region, as presented in the *San Francisco Bay Basin Water Quality Control Plan* (San Francisco Bay Regional Water Quality Control Board 2015) and the *Water Quality Control Plan for the Central Coastal Basin* (Central Coast Regional Water Quality Control Board 2016). If a project will affect waters of the state (as defined by the California State Water Resources Control Board), project proponents are required to apply to the geographically appropriate RWQCB for waste discharge requirements (waters of the State of California) or for CWA Section 401 certification (waters of the United States). The RWQCB reviews applications for waste discharge requirements and certifications to ensure that potential impacts on waters of the United States and state have been avoided and minimized to the maximum extent practicable.

To assist project proponents in designing projects to avoid and/or minimize impacts on waters of the state, the San Francisco Bay Regional Water Quality Control Board developed a technical reference circular titled "*A Primer on Stream and River Protection for the Regulator and Program Manager*," that provides guidance for applicants on how to design projects that protect and restore stream and wetland system functions. Project proponents are encouraged to consult this circular when developing projects with potential impacts on creeks or wetlands (San Francisco Bay Regional Water Quality Control Board 2003).

Projects that affect creeks or wetlands should strive to achieve three water quality objectives—watershed hydrology, stream dynamic equilibrium, and stream and wetland system habitat integrity. The following is a summary of the technical reference circular. This guidance applies broadly to all RWQCBs.

- **Watershed hydrology.** The hydrologic connectivity between headwaters and estuary, surface water and groundwater, and landscape, floodplain, and stream channel should be protected to produce the pattern and range of flows necessary to support beneficial uses identified in the San Francisco Bay Basin Plan and a functional ecosystem.
- **Stream dynamic equilibrium.** Stream attributes, including hydrologic and sediment regimes, vegetation communities, channel forms, slopes, and floodplain areas, should be protected in a manner so as not to arrest natural hydrogeomorphic processes nor accelerate an imbalance resulting in excessive erosion or deposition of sediment, cause nuisance, or otherwise adversely affect beneficial uses. Over time, watershed processes contribute to a dynamic balance between sediment loads and surface water flows, which produce complex, fluctuating, and resilient systems.
- **Stream and wetland system habitat integrity.** Stream and wetland system habitats should be maintained by protecting the type, amount, and complexity of wetland and riparian vegetation, the extent of riparian areas, and the substrate characteristics necessary to support aquatic life.

Achievement of these water quality objectives protects and restores the physical integrity and associated functionality of stream and wetland systems, which include perennial, intermittent, and ephemeral streams and wetlands and their associated riparian areas. The following four principles should be used in developing projects in order to achieve the water quality objectives.

- **Water quality functions and land use.** Functioning stream and wetland systems provide a wide range of water quality benefits that support the beneficial uses identified in the San Francisco Bay Basin Plan. Many land use activities have the potential to substantially degrade water quality functions of stream and wetland systems. Therefore, project proponents should recognize the intrinsic connections between land use activities and the structures, processes, and functions of stream and wetland systems.
- **No net loss.** Stream and wetland system areas, functions, and beneficial uses in the region have been substantially degraded from historical levels because of human activities. Therefore, the remaining resources are especially valuable. Projects and associated mitigation measures should be consistent with the California Wetlands Conservation Policy (No Net Loss Policy, Executive Order W-59-93) to ensure no net loss and to achieve a long-term net gain in the quantity, quality, and permanence of stream and wetland system areas, functions, and beneficial uses.
- **Climate change adaptation.** Stream and wetland system protection and restoration are a critical element of a strategy for reducing adverse impacts of greenhouse gas emissions and adapting the region's water resource management to account for the adverse impacts of climate change and sea level rise. Protecting and restoring stream and wetland system functions, including floodwater storage, groundwater recharge, carbon sequestration (e.g., in riparian vegetation and wetland soils that are rich in organic matter), and maintaining aquatic life and wildlife habitat connectivity are important to mitigate for the adverse impacts of climate change.
- **Watershed approach.** Many water quality and ecosystem problems are best identified, prioritized, addressed, and solved using a watershed approach. A watershed approach helps to address cumulative impacts on water quality and encourages the development of watershed plans and partnerships that coordinate the planning, use, and protection of stream and wetland system resources. Project proponents should consider their project's impacts when multiple individual impacts add to or interact with other impacts in a watershed, resulting in cumulative adverse impacts on water quality. Project proponents should include all appropriate and practicable measures to avoid and minimize potential direct, secondary, and cumulative temporary and permanent impacts on water quality and beneficial uses.

Tables B-1 through B-3 summarize goals for achieving the water quality objectives.

Table B-1. Watershed Hydrology Goals for Stream and Wetland System Functions

Runoff flow and volume

Maintain site runoff and transport characteristics (i.e., timing, magnitude, duration, time of concentration, and discharge pathways of runoff flow) such that post-project flow rates and durations mimic pre-project levels. Where practicable, incorporate measures to restore natural runoff patterns (e.g., enhance soil infiltration capacity and increase the storage of runoff) in watersheds that have been substantially altered from their predevelopment conditions.

Hydrologic connectivity

Maintain lateral, vertical, and longitudinal flow pathways, including connectivity between stream channels, riparian areas, floodplains, and wetlands; surface water and groundwater; and ocean or estuary-to-headwaters at adequate levels to protect stream and wetland system functions and beneficial uses, including the maintenance of, and access to, a diverse range of habitats for aquatic life and wildlife.

Natural flow regime

Maintain the natural variation of flows and hydrograph characteristics (i.e., timing, magnitude, duration, and time of concentration) such that the range of flows including low, channel forming, and flood flows are of a magnitude and duration to achieve the following goals.

- Sustain channel morphology and balance sediment transport.
- Support riparian vegetation community maintenance.
- Provide adequate flows and velocities during low-flow months to satisfy aquatic life and wildlife habitat requirements.
- Maintain seasonal flows that permit the migration or free movement of migratory fish and access to floodplain and off-channel habitat (e.g., sloughs and permanently or seasonally flooded wetlands) for aquatic life.

Table B-2. Stream Dynamic Equilibrium Goals for Stream and Wetland System Functions

Channel form and processes

Where channels are modified, design projects with proper channel form (e.g., channel shape, width/depth ratio), sinuosity, slope, and floodplain areas such that the balance between sediment loads and surface flows is attained for a range of low to high discharges. This goal promotes natural bank erosion as a desirable attribute of stream and wetland systems while requiring that projects avoid causing excessive erosion or deposition of sediment in and around the project area, creating hydraulic constrictions (e.g., undersized culverts), or requiring ongoing channel maintenance (e.g., dredging to maintain channel capacity, ongoing bed and bank repair). Where practicable, restore channel dimensions and slopes, riparian vegetation communities, floodplain, meander belt, and geomorphic adjustment zone widths, and adequate side slopes from the top of the banks to the top of the floodplain terraces in areas where geomorphic dynamic equilibrium has been affected.

Drainage network

Maintain the naturally occurring pattern and density of perennial, intermittent, and ephemeral streams, as well as associated aquatic habitats (e.g., wetlands) that transport water, materials, energy, and organisms through the watershed (i.e., the drainage network). Avoid changing the natural runoff pathways by filling, piping, ditching, or culverting.

Gullies and headcuts

Avoid formation or expansion of headcuts and gullies. Design projects with proper channel slope and avoid reducing the landscape infiltration capacity and increasing runoff, which may lead to soil erosion and gully formation or expansion.

Table B-3. Stream and Wetland System Habitat Integrity Goals for Stream and Wetland System Functions

Floodplain and riparian areas Maintain floodplains and/or riparian areas of adequate width to provide water quality functions such as floodwater and sediment storage, water quality enhancement, and maintenance of aquatic life and wildlife habitat. Establishment and protection of functioning riparian areas is one of the most straightforward and effective strategies to protect water quality; this strategy is a critical element in adapting to the impacts of climate change including changes in rainfall and runoff patterns.
Wetland hydrology Maintain the natural hydrologic regimes of wetlands, including their hydroperiods and levels of hydrologic connectivity to other aquatic habitats, at levels sufficient to support hydrophytic vegetation (where naturally present), aquatic life and wildlife habitat, and other associated beneficial uses.
Wetland and riparian vegetation Maintain wetland and riparian vegetation (both woody and herbaceous) such that the type, amount, and complexity are adequate to maintain water temperatures appropriate to the needs of aquatic life, withstand site-specific erosive forces, and supply large woody debris of sufficient quantities to maintain aquatic habitat.
Habitat connectivity Avoid creating unnatural barriers between or within stream/wetland systems and upland habitats (e.g., in-stream structures that restrict fish migration or encroachments on floodplains that restrict wildlife movement along a riparian corridor). These barriers affect migration corridors and dispersal systems connecting aquatic life and wildlife with resources and refuges. Protecting stream and wetland system corridors can increase the resiliency of biodiversity by providing migration corridors as aquatic life and wildlife adapt to the impacts of climate change on habitat conditions and distribution.

Compensatory Mitigation Approach

This Santa Clara County RCIS was designed with the intent that it not only meets compensatory mitigation requirements of CDFW under the CESA, but that it also supports compliance with state and federal water-related regulations and the ESA. Guidance on how this Santa Clara County RCIS can support implementation of compensatory mitigation for separate, but related, regulations is provided below.

Compliance with the Clean Water Act and the Porter-Cologne Water Quality Control Act

An RCIS can provide information and analysis useful for identifying conservation actions and habitat enhancements to fulfill compensatory mitigation requirements under federal and state water quality protection laws. For example, both federal and state guidance for compensatory mitigation for impacts on aquatic resources stress the need for a *watershed approach* to compensatory mitigation. This approach considers the importance of landscape position and resource type of compensatory mitigation projects for the sustainability of aquatic resource functions within the watershed.

In 2008, the Corps and U.S. Environmental Protection Agency (USEPA) adopted regulations governing compensatory mitigation for impacts on waters of the United States authorized in permits issued pursuant to CWA Section 404 (the Compensatory Mitigation Rule).[9] The Compensatory

[9] 33 CFR Part 332

Mitigation Rule requires the Corps to ". . . use a watershed approach to establish compensatory mitigation requirements in [Corps] permits to the extent appropriate and practicable."[10] The Rule defines a watershed approach as:

> . . . an analytical process for making compensatory mitigation decisions that support the sustainability or improvement of aquatic resources in a watershed. It involves consideration of watershed needs, and how locations and types of compensatory mitigation projects address those needs. A landscape perspective is used to identify the types and locations of compensatory mitigation projects that will benefit the watershed and offset losses of aquatic resource functions and services caused by activities authorized by [Corps] permits. The watershed approach may involve consideration of landscape scale, historic and potential aquatic resource conditions, past and projected aquatic resource impacts in the watershed, and terrestrial connections between aquatic resources when determining compensatory mitigation requirements for [Corps] permits.[11]

The ultimate goal of a watershed approach is to ". . . maintain and improve the quality and quantity of aquatic resources within watersheds through strategic selection of compensatory mitigation sites."[12] Similarly, the State Water Resources Control Board proposes to require an almost identical watershed approach to compensatory mitigation as identified in its *Draft Procedures for Discharges of Dredged or Fill Materials to Waters of the State* (Draft Procedures) (California State Water Resources Control Board 2016a:28, 2016b).

The information needs identified for a watershed approach under the Compensatory Mitigation Rule and State Water Resources Control Board's Draft Procedures are almost identical. Where a watershed plan is available, it can be the basis of the watershed approach. A *watershed plan* is defined as follows.

> . . . a plan developed by federal, tribal, state, and/or local government agencies or appropriate non-governmental organizations, in consultation with relevant stakeholders, for the specific goal of aquatic resource restoration, establishment, enhancement, and preservation. A watershed plan addresses aquatic resource conditions in the watershed, multiple stakeholder interests, and land uses. Watershed plans may also identify priority sites for aquatic resource restoration and protection. Examples of watershed plans include special area management plans, advance identification programs, and wetland management plans.[13]

Where a watershed plan is not available, a watershed approach to compensatory mitigation may be based on the following elements.

> . . . analysis of information regarding watershed conditions and needs, including potential sites for aquatic resource restoration activities and priorities for aquatic resource restoration and preservation. Such information includes: current trends in habitat loss or conversion; cumulative impacts of past development activities, current development trends, the presence and needs of sensitive species; site conditions that favor or hinder the success of compensatory mitigation projects; and chronic environmental problems such as flooding or poor water quality.[14]

This RCIS is intended to provide information, analysis, and a process that supports a watershed approach to compensatory mitigation. Staff from the Corps, USEPA, and applicable RWQCBs were involved in the process of developing this RCIS in an effort to ensure that it provides accurate and up-to-date information and analysis regarding the watersheds and aquatic resources within the RCIS strategy area.

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[10] 33 CFR 332.3(c)(1)

[11] 33 CFR 332.2

[12] 33 CFR 332.3(c)(1)

[13] 33 CFR 332.2:25, lines 872–878.

[14] 33 CFR 332.3(c)(3):29, lines 1030–1948.

This Santa Clara County RCIS includes information and analysis regarding aquatic resources that can be used for compensatory mitigation under the federal CWA and the Porter-Cologne Act in several ways. Project proponents can use the information in this RCIS (e.g., conservation actions and priorities) to develop and site compensatory mitigation actions in connection with a specific permit or project. Mitigation bankers can use the information to develop and site mitigation banks that generate mitigation credits. Public agencies can use the information to develop and establish in-lieu fee programs that generate mitigation credits. In each of these cases, the approval of the Corps and/or the applicable RWQCB would be required. However, this RCIS could be useful in developing mitigation proposals for their approval.

Mitigation credit agreements that meet the requirements of relevant Corps, USEPA, and RWQCB mitigation regulations and policies could also be used to generate mitigation credits for compensatory mitigation under the CWA and Porter-Cologne Act. MCAs can create mitigation credits that can be used to fulfill "compensatory mitigation requirements established under any state or federal environmental law, as determined by the applicable local state, or federal regulatory agency . . ."[15] California CDFW approval of an MCA does not authorize the creation of mitigation credits under the CWA or Porter-Cologne Act. However, if the Corps or RWQCB determines that an MCA meets relevant federal requirements under the CWA and Porter-Cologne Act, they could allow the MCA to create mitigation credits that can be used under those acts. For example, the Corps and USEPA could determine that the MCA meets the Compensatory Mitigation Rule regulations and policies for in-lieu fee programs and could approve the MCA as an in-lieu fee program-enabling instrument. By fulfilling relevant Corps and USEPA requirements and obtaining their approval, the MCA could then be used to create mitigation credits that could be used to comply with the CWA. Similarly, the RWQCB could determine that such mitigation credits are consistent with Porter-Cologne Act requirements for purposes of a CWA Section 401 certification.

Compliance with the Federal Endangered Species Act

An RCIS can provide information and analysis for identifying conservation actions and habitat enhancements to fulfill compensatory mitigation requirements under federal wildlife protection laws. For example, in December 2016, the USFWS published their final compensatory mitigation policy under the ESA.[16] For compensatory mitigation under the federal ESA, USFWS prefers the following mitigation conditions.

- Compensatory mitigation projects sited within priority conservation areas identified in landscape-scale conservation plans.
- Compensatory mitigation projects implemented in advance of impacts.
- Mitigation mechanisms that consolidate compensatory mitigation on the landscape.

USFWS has also described the following standards for compensatory mitigation.

- Siting compensatory mitigation in locations identified in landscape-scale conservation plans or mitigation strategies in areas that will meet conservation objectives and provide the greatest long-term benefit to the species.
- Providing compensatory in-kind mitigation for the species affected by the proposed action.
- Providing metrics to measure the ecological functions at compensatory mitigation sites that are science-based, quantifiable, consistent, repeatable, and related to the conservation goals for the species.

[15] CFGC 1856(c)

[16] 81 FR 95316–95349.

- Providing benefits beyond those that would have otherwise occurred through routine or required practices or actions.
- Achieving conservation objectives within a reasonable timeframe or for at least the duration of the impacts.
- Securing the compensatory mitigation by durable means, including adequate legal, real estate, and financial protections that ensure its success.
- Providing accountability in case compensatory mitigation fails to meet its conservation objectives.
- Providing for appropriate and effective engagement of local communities and stakeholders.

This Santa Clara County RCIS is intended specifically to provide information, analysis, and a process that supports compensatory mitigation that meets all of these criteria. USFWS has reviewed this Santa Clara County RCIS during the public review period which helped to ensure that that it provides accurate and up-to-date information and analysis regarding species listed under the federal ESA.

This Santa Clara County RCIS includes information and analysis regarding federally listed species that can be used for compensatory mitigation under the federal ESA in a variety of ways. They can be used by project proponents to develop and site mitigation actions in connection with a specific permit or project. They can be used by mitigation bankers to develop and site conservation banks that generate mitigation credits, and they can be used by public agencies to develop and establish in-lieu fee programs that generate mitigation credits. In each of these cases, the approval of USFWS or NMFS would be required. However, this Santa Clara County RCIS could be useful in developing mitigation proposals for their approval.

USFWS or NMFS could also incorporate or refer to an RCIS in regulatory designations and analyses, such as recovery plans, critical habitat designations, habitat conservation plans, and biological opinions. For example, USFWS could determine that the mitigation strategies or actions of an RCIS meet the requirements of Section 7 of the federal ESA and include them in a biological opinion.

MCAs that meet the requirements of relevant USFWS or NMFS mitigation regulations and policies could also be used to generate mitigation credits for compensatory mitigation under the federal ESA.[17] For example, USFWS could determine that the MCA meets regulations and policies for conservation banks and could approve the MCA as a programmatic (umbrella) conservation bank-enabling instrument. Or USFWS or NMFS could determine that the MCA meets its policies for in-lieu fee programs and could approve the MCA as an in-lieu fee program-enabling instrument.

[17] CFGC 1856(c).

References

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Appendix C
Public Outreach

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Public Outreach

Santa Clara County RCIS Conservation Partners

During the Santa Clara County Regional Conservation Investment Strategy (RCIS) development process, the Steering Committee conducted outreach and provided briefings for key environmental, agricultural, and business organizations; local governments, including counties and cities in the RCIS area; and the San Francisco Bay Area regional advance mitigation planning (RAMP) program's Technical Advisory Committee. The Steering Committee also held two conservation partner meetings, with the following goals.

1. Provide conservation partners in the region with information on this RCIS and RAMP planning efforts.
2. Invite partner input regarding draft ecological values, and approaches to identifying conservation priorities, and actions.

Partner Engagement Meeting #1 was held on August 3, 2016 at Santa Clara Valley Open Space Authority offices in San José , California. Partner Engagement Meeting #2 was held on February 14, 2017 through a Webinar.

The following organizations and agencies participated in the Santa Clara County RCIS Partner Engagement Meetings.

- Association of Monterey Bay Area Governments.
- California Department of Fish and Wildlife-Bay Delta (Region 3).
- California Department of Fish and Wildlife-Central (Region 4).
- California Department of Fish and Wildlife-Habitat Conservation Planning Branch.
- California Department of Transportation.
- California Strategic Growth Council.
- Creekside Center for Earth Observations.
- Midpeninsula Regional Open Space District.
- National Marine Fisheries Service (Central Coast).
- National Marine Fisheries Service (South-Central Coast).
- Pajaro River Watershed Flood Prevention Authority.
- Peninsula Open Space Trust.
- Regional Water Quality Control Board-Central Coast.
- Regional Water Quality Control Board-San Francisco.
- San José State University.
- Santa Clara County Parks.

- Santa Clara Valley Habitat Agency.
- Santa Clara Valley Transportation Authority.
- Santa Clara Valley Water District.
- U. S. Army Corps of Engineers.
- U. S. Fish and Wildlife Service (Sacramento).
- U. S. Fish and Wildlife Service (Ventura).

Following is a list of invite and meeting materials provided for each Partner Engagement Meeting. These items are available upon request from the Santa Clara Valley Open Space Authority.

1. Partner Engagement #1 Meeting Materials.
    a. Santa Clara County RCIS and RAMP partner meeting agenda.
    b. Santa Clara County RCIS and RAMP overview.
    c. List of Santa Clara County RCIS and RAMP Steering Committee Members.
    d. Santa Clara County RCIS and RAMP partner invitee list.
    e. Figure of the Bay Area RCIS boundaries.
    f. Figure of the Santa Clara County RCIS area.
    g. Figure of land cover in the Santa Clara County RCIS area.
    h. Table of Santa Clara County RCIS wildlife focal species.
    i. Table of Santa Clara County RCIS plant focal species.
2. Partner Engagement #2 Meeting Materials.
    a. Partner Meeting #2 Webinar.

Public Meeting

A public meeting was held on December 8, 2016 at Santa Clara Valley Open Space Authority (Authority) offices in San José , California. Notice of this meeting was posted in the San José Mercury News and on the Authority's website and was sent directly to representatives of the cities and counties within or adjacent to this RCIS, including the clerks of the board and city councils, as well as subscribers of the agency's Board meeting packet. The public meeting was held as part of a regularly scheduled Board of Directors meeting.

Following are the public meeting notice and handout provided at the public meeting.

Notice of Public Meeting on the Proposed Santa Clara County Regional Conservation Investment Strategy

Interested parties are invited to attend a regular meeting of the Santa Clara Valley Open Space Authority Board of Directors to be held at 6:30 PM on December 8, 2016 at the Open Space Authority's administrative offices, 6980 Santa Teresa Blvd., Ste. 100, San José , CA 95119. The meeting agenda will include an item which allows interested parties to receive preliminary information about a proposed Santa Clara County Regional Conservation Investment Strategy (RCIS) and to provide comments. Regional Conservation Investment Strategies are new, voluntary, landscape-scale conservation planning tools that will identify conservation priorities to guide public and private conservation actions, such as habitat protection or restoration. Guided by state legislation (AB 2087), the Santa Clara Valley Open Space Authority is sponsoring development of an RCIS for Santa Clara County and the northern portion of San Benito County in the Upper Pajaro River region. Following approval of the Santa Clara County RCIS by the California Department of Fish and Wildlife (Department), conservation actions identified in the RCIS could be used to develop mitigation credit agreements with the Department for transportation and other projects. The Santa Clara County RCIS is part of a broader effort to implement regional advance mitigation planning in the Bay Area to facilitate landscape-scale conservation while improving the delivery of transportation projects.

Interested persons may provide oral and written comments at said time and place. Written comments may also be sent to the Open Space Authority, Attn: Santa Clara RCIS, 6980 Santa Teresa Blvd., Ste. 100, San José , CA 95119 or via email: clerk@openspaceauthority.org. Written comments should be provided by December 8, 2016.

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Suite 100
San Jose, CA 95119
408.224.7476 T
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openspaceauthority.org

Santa Clara County Regional Conservation Investment Strategy

A new State law passed in 2016, AB 2087, establishes a conservation planning tool called a Regional Conservation Investment Strategy (RCIS) to promote the conservation of species, habitats, and other natural resources. The Santa Clara County RCIS, which addresses Santa Clara County and northern San Benito County, is one of four pilot RCISs currently being developed in California.

The Santa Clara County RCIS:

- Is a voluntary, non-binding assessment of conservation priorities;
- Is being developed based on existing plans and other information, including the *Santa Clara Valley Greenprint*, the *Valley Habitat Plan*, and the Bay Area's *Conservation Lands Network,* among others;
- Promotes implementation of landscape-scale conservation actions, such as habitat protection, restoration, and enhancement measures including efforts to enhance landscape connectivity for wildlife;
- Coordinates various types of conservation investments, such as:
  - local, state, and federal government conservation projects;
  - private foundation and conservation organization (e.g. land trust) projects;
  - mitigation projects by private entities and public agencies;
- Considers focal species and sensitive habitats, and addresses working lands, proposed infrastructure, and development projects;
- Is designed to be consistent with and complement the Valley Habitat Plan, a regional HCP/NCCP that covers a portion of the RCIS plan area;
- Is being sponsored by the Santa Clara Valley Open Space Authority, which is developing the RCIS in collaboration with partner organizations and agencies and with the assistance of a consultant team, through a planning process providing opportunities for public input; and
- Will be provided for approval by the California Department of Fish and Wildlife, with opportunities for other regulatory agencies to 'sign on' and similarly utilize the RCIS for their work.

Once finalized, the Santa Clara County RCIS can help expedite delivery of public infrastructure projects by facilitating regional advance mitigation planning: a process in which the environmental mitigation for impacts from multiple projects is pooled and conducted in advance, resulting in larger conservation projects that have greater benefits, while expediting delivery of public infrastructure projects such as transportation or water supply projects.

Additional information about the RCIS program can be found at: https://www.wildlife.ca.gov/Conservation/Planning/Regional-Conservation. To provide input or request more information, please contact: Santa Clara Valley Open Space Authority 6980 Santa Teresa Blvd, Suite 100, San José , CA 95119; or RCIS@openspaceauthority.org

Regulatory Agency Outreach

The following regulatory agencies were invited to participate in the development of the Santa Clara County RCIS through agency-specific meetings as well as participation in the Partner Engagement Meetings.

- U.S. Army Corps of Engineers, San Francisco District.
- San Francisco Bay Conservation and Development Commission (BCDC).
- California Department of Fish and Wildlife–Region 3.
- California Department of Fish and Wildlife–Headquarters.
- Environmental Protection Agency–Region 9.
- National Marine Fisheries Service–Central Coast.
- San Francisco Bay Regional Water Quality Control District.
- State Water Resources Control Board.
- U.S. Fish and Wildlife Service–Bay-Delta Region.
- U.S. Fish and Wildlife Service–Pacific Southwest Region.
- U.S. Fish and Wildlife Service–Sacramento Branch.
- U.S. Fish and Wildlife Service-Ventura Fish and Wildlife Office.

RAMP Technical Advisory Committee

The following entities participated in the meetings of the San Francisco Bay Area RAMP Technical Advisory Committee.

- Alameda County Transportation Commission.
- California Department of Fish and Wildlife–Headquarters.
- California Department of Fish and Wildlife–Region 3.
- California Natural Resources Agency.
- Contra Costa Transportation Authority.
- East Contra Costa County Habitat Conservancy.
- Environmental Protection Agency–Region 9.
- Caltrans Headquarters.
- Caltrans, District 4.
- Contra Costa Transportation Authority.
- Metropolitan Transportation Commission.
- National Marine Fisheries Service–Central Coast.

- San Francisco Bay Conservation and Development Commission.
- San Francisco Bay Regional Water Quality Control District.
- Santa Clara Valley Transportation Authority.
- Santa Clara County Habitat Conservancy.
- Solano Transportation Authority.
- U.S. Fish and Wildlife Service.
- ICF.
- Jodi McGraw Consulting.
- AECOM.
- Resources Law Group.

Public Comments and Responses

This appendix includes public comments and responses to those comments provided orally during the RCIS public meeting held by the Santa Clara Valley Open Space Authority (Authority) on December 8, 2016 as part of its Board of Directors meeting and written comments provided during the public comment period.

California Fish and Game Code (FGC) and California Department of Fish and Wildlife's (CDFW) RCIS Program Guidelines (Program Guidelines) (California Department of Fish and Wildlife 2017) requires that the RCIS proponent respond to written comments as follows.

- To written comments submitted during the public meeting(s) and during the public comment period.[1]
- To written comments provided by the cities and counties within the RCIS area.[2]

Oral Comment

Doug Muirhead, resident of Morgan Hill, Santa Clara County. December 8, 2016.

The following comment was provided by Doug Muirhead during the public meeting.

Comment

I'm not speaking for or against the RCIS in part because I first learned of it over the weekend when I read your agenda packet.

The staff report speaks in very general terms about what you're doing. I continue to be interested in some of the hows and whys. A couple of things I would have liked to have seen before getting here tonight:

1. Past actions. Back in April you entered into a grant agreement with The Nature Conservancy to prepare a Regional Conservation Investment Strategy for Santa Clara County. My guess is that has something to do with why you're here tonight.
2. The other thing that interests me more is having some related projects section that would identify inter-relationships and special considerations among multiple projects. The public does not know why you choose to do a Coyote Valley project with the Water District, a different project with south county agricultural preservation in partnership with the County, and now this RCIS.

Also missing is how others are attempting to address these issues. For example, LAFCO staff mentioned attending a November 14 Bay Area Greenprint Strategic Advisory meeting. The Bay Area Greenprint seeks to develop a data-driven toolkit that incorporates information about natural and agricultural values into land use and transportation planning. My guess is that has something to do with what you're attempting to do tonight.

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[1] CFGC 1854(c)(3).
[2] CFGC 1854(c)(5).

Someone in the agency is clearly thinking about how you allocate staff time, priorities, and milestones because the three projects I just mentioned are all within your fiscal year budget and project workplan. The handout you provided mentions your Greenprint, as did the presentation. It's not in the staff report. You don't link back to the ten conservation focus areas, one of which is what you're talking about here tonight.

I'm glad you're doing this. I really wish you'd help us understand how you pick your projects, how they work together, and how your wonderful staff gets spread out to handle these multiple activities, and then give us a hint about some milestones for these multiple projects.

Response

Staff of the Authority briefed their Board of Directors that the Authority would be the local sponsor of the Santa Clara County RCIS and that the Authority had received grant funding through The Nature Conservancy to support staff's and consultants work on the project. The Authority provides updates on the Santa Clara County RCIS on its website[3].

The Authority seeks to take advantage of available funding to protect land in our priority conservation focus areas. The Nature Conservancy provided the Authority such an opportunity with the Santa Clara County RCIS. The Authority held the Santa Clara County RCIS public meeting to provide a venue for the Authority to inform the public about the RCIS and for the public to provide oral or written comments.

Written Comments

Eleven written public comment letters were submitted to the Authority and CDFW during the public review period.

- The Authority received three written comment letters in February 2017 after the second Conservation Partner Meeting held through a Webinar on February 14, 2017.
- The Authority and CDFW received eight written comment letters during the public review period that ran from January 22, 2018 through April 12, 2018.

No written comments were received during or after (i.e., within 60 days) the public meeting held on December 6, 2016. At the public meeting, the Authority provided comment cards and requested that individuals or parties wishing to provide comments shall provide written comments in order for those comments to be included in this RCIS with the RCIS proponent's response.

Written public comments are presented in the following pages, ordered by date the comment letter was received (earliest to latest). Each comment has been assigned a unique number, noted in the right margin. For example, the code "1-3" indicates the third distinct comment (indicated by the "3") in letter number 1. Immediately following the comment letter is a summary of each distinct comment and the Santa Clara County RCIS Steering Committee's response. Table C-1 summarizes the commenting party, comment letter signatory, and date of the comment letter.

[3] https://www.openspaceauthority.org/conservation/current-projects/regional-conservation-investment-strategy.html

Table 0-1. List of Comment Letters

Letter	Agency/Organization/Individual	Comment Letter Signatory	Date
1	California State Transportation Agency (Caltrans) District 5, Environmental Stewardship Branch	Nancy R. Siepel— Mitigation and Wildlife Connectivity Specialist	February 15, 2017
2	Dr. Jerry J. Smith	Jerry J. Smith—Emeritus Professor, San José State University	February 25, 2017
3	Dr. Jerry J. Smith	Jerry J. Smith—Emeritus	February 25, 2017
4	Association of Monterey Bay Area Governments	Maura F. Twomey – Executive Director	March 9, 2018
5	County of San Benito, Board of Supervisors	Anthony Botelho – Chairman Board of Supervisors	March 20, 2018
6	Doug Muirhead, City of Morgan Hill, County of Santa Clara	Doug Muirhead	March 21, 2018
7	The Habitat Institute	Thomas O’Neill	March 22, 2018
8	The Habitat Institute	Thomas O’Neill	March 23, 2018
9	U.S. Fish and Wildlife Service	Bronwyn Hogan	April 11, 2018
10	Caltrans, Division of Environmental Analysis	Amy Bailey – Office Chief, Strategic Biological Planning, Advance Mitigation, Innovation	April 12, 2018
11	The Habitat Institute	Thomas O’Neill	April 30, 2018

Jodi M. McGraw, Ph.D.
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From: Siepel, Nancy R@DOT [mailto:nancy.siepel@dot.ca.gov]
Sent: Wednesday, February 15, 2017 4:51 PM
To: Jodi M. McGraw <jodi@jodimcgrawconsulting.com>
Subject: RE: Santa Clara RCIS documents for partner review

Hi Jodi,

Here are a couple of my comments on the maps and setting conservation priorities etc:

Species maps:
The blue hashed line isn't described in the legend. What does it represent?
For the bird species maps the legend uses green to show breeding and yellow to show other aspects except for Swainson's reversed the colors. Would help to be consistent between the maps for the birds.

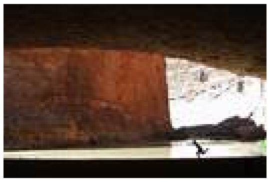
Congdon's FYI:
I'm not familiar with locations for Congdon's in most of the RCIS geographic area. In Monterey County it occurs in highly disturbed areas within the Caltrans right-of-way along Hwy 101 in the Salinas Valley and Hwy 68 between Salinas and Monterey. I suspect it might be more common than the database indicates and there's more habitat in the planning area than the modeling picked up by limiting the type of habitat it can occur in.

Approach to setting conservation priorities:
During the presentation 2 alternative approaches were described. Is the plan to end up with only one of these options or could both be available to the user?
Just thinking that in an ideal world it would be nice to have established priority areas to target. However, the reality is that conservation/mitigation requires willing land owners and there may need to be a way for the user to determine priority areas based on where there are interested land owners.

Nancy

Nancy Siepel
Mitigation and Wildlife Connectivity Specialist
Environmental Stewardship Branch, Caltrans District 5

805-549-3573

 "**Life is succinct: Follow your heart and live your dreams.**

Comments and Responses

1. Caltrans District 5, Environmental Stewardship Branch, February 15, 2017

Summary of Comment 1-1

This comment provided feedback on a draft of the focal species habitat models (Appendix H, *Focal Species Habitat Models*).

Response to Comment 1-1

Thank you for your helpful editorial comments. The blue dashed line in the habitat models identifies the boundaries of the conservation planning units. This was added to the legend. The color coding for the focal bird species was made consistent by changing green to represent breeding habitat and yellow foraging habitat on the Swainson's hawk map of modeled habitat.

Summary of Comment 1-2

This comment notes that Congdon's spikeweed may be more common than occurrence databases indicate, and that the habitat model may underestimate the amount of suitable habitat in the RCIS area.

Response to Comment 1-2

All CNDDB occurrence records of Congdon's spikeweed in the RCIS area are clustered around the southern edge of the baylands north of SR 237 and Interstate 880 (Figure H-10, Appendix H) (California Department of Fish and Wildlife, Natural Diversity Database 2016). Although Congdon's spikeweed may occur elsewhere in the RCIS area (and may be relatively more common), modeled habitat was limited to potentially suitable habitat adjacent to the existing occurrences in the RCIS area, all located north of California SR 237 and west of Interstate 880 (California Department of Fish and Wildlife, California Natural Diversity Database 2016), to avoid greatly overestimating habitat for this species. The conservation strategy includes a conservation action to survey for new occurrences in potentially suitable habitat (Conservation Action CSPW-3). The conservation strategy also calls for enhancement of occupied habitat, including habitat occupied by newly discovered occurrences.

Summary of Comment 1-3

This comment asks about the approach to setting conservation priorities presented in the second Conservation Partner meeting, held by webinar on February 14, 2017. Specifically, the comment notes that two alternative approaches to priority setting were presented and asks whether the plan was to use only one of the options or whether both could be available to the user.

Response to Comment 1-3

The following two approaches to setting conservation priorities were presented during the February 14, 2017 webinar:

- Alternative 1. Prioritizes areas for protection based on species-specific parameters and displays additional conservation value parameters for reference.

- Alternative 2. Presents species-specific parameters, and two additional conservation value parameters, for user to determine priority areas for protection. Does not prioritize areas for user.

Although the approach to setting conservation priorities evolved since the webinar on February 14, 2017, the approach used in the RCIS incorporates aspects of both alternatives. Conservation priorities are identified within the conservation strategies for the focal species and other conservation elements (Chapter 3, *Conservation Strategy*). For some species, conservation actions are prioritized based on a range of criteria such as the presence of known occurrences, critical habitat, and important habitat features (e.g., ponds that provide breeding habitat for California tiger salamander and California red-legged frog) (Chapter 3, Section 3.2.2.1, *Identifying Conservation Priorities*). Conservation priorities are intended to be flexible to accommodate for new information and feasibility of implementing conservation actions (e.g., willing landowners), among other factors.

Comments on Amphibians for the Regional Conservation Investment Strategy

Jerry J. Smith
Emeritus, San Jose State University

California Tiger Salamander

The model indicates a very extensive area of potential habitat associated with all wetland and pond types within grasslands and other habitats. This results in very extensive potential habitat associated with hundreds of ranch ponds in the Mt. Hamilton Range. However, CNDDB locations are concentrated primarily on the western (moister) portion of the range. Within Henry Coe State Park the known locations are concentrated within the southwest portion of the park. However, Joseph Belli did an extensive survey within Henry Coe State Park and found CTS only in that portion of the park. Ponds farther east in the rain shadow of multiple ridges lacked CTS. Similarly, in my 2016 survey within the CDFW Canada de los Osos Reserve (attached; sites have been submitted to CNDDB and GPS locations are in the report) CTS were found in six ponds in the western portion of the reserve. As in Henry Coe SP ponds farther east or associated with oak forest lacked CTS.

These drier habitats farther inland probably lacked conditions suitable to support CTS breeding prior to the construction of ranch ponds (such as more persistent intermittent streams or seeps). These ponds are far enough from original CTS habitat that the salamanders would be unlikely to move that far to colonize. Many of the indicated ranch ponds could potentially support CTS, but transplants would be require to establish those populations.

Foothill Yellow-legged Frog

The model and map indicate very extensive potential habitat even though CNDDB locations are almost exclusively restricted to low gradient ("foothill") portions of upper Llagas Creek, upper Coyote Creek, and upper Alameda Creek tributaries. There are also records for Guadalupe Creek above and below Guadalupe reservoir. That one location below the Guadalupe Reservoir (near a tributary) is the only location downstream of reservoirs with their altered and variable stream flow pattern. Including stream gradients up to 11% and almost all plant communities, including conifer forest does not match my experience, where YLF were mostly associated with lower gradient streams, often intermittent ones, where adjacent forests were sparser and riparian canopy more open. Very dry streams that dry early and without summer stream refugia also appear to lack YLF.

2. Dr. Jerry J. Smith, Emeritus Professor, San José State University, February 25, 2017

Summary of Comment 2-1

The California tiger salamander habitat model indicates an extensive area of potential habitat associated with all wetland and pond types within grasslands and other habitats. Drier habitats in the eastern portion of the RCIS area lack California tiger salamander, and probably lacked conditions suitable to supporting California tiger salamander prior to the construction of ranch ponds.

Response to Comment 2-1

The RCIS acknowledges that the habitat models overestimate the actual extent of suitable habitat (Chapter 2, *Environmental Setting*, Section 2.2.5.2, *Habitat Distribution Models, Model Uses and Limitations*). However, the habitat models are only intended to be used for planning purposes at the scale of the RCIS area. If used to inform conservation or other uses, species' habitat and occurrences should be verified in the field.

The California tiger salamander model includes potential habitat in the eastern portion of the RCIS a to be consistent with the range of the species, as shown in Figure 1 in the *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander* (U.S. Fish and Wildlife Service 2017). The RCIS models considerably more potential habitat in the eastern portion of the RCIS area than is shown in Figure 1 of the recovery plan, however, due to the coarse scale of the RCIS habitat model.

Summary of Comment 2-2

Dr. Smith states that the foothill yellow-legged frog model includes extensive amounts of habitat, even though CNDDB locations are almost exclusively restricted to low gradient portions of upper Llagas Creek, upper Coyote Creek, upper Alameda Creek tributaries, and above and below Guadalupe reservoir. Including stream gradients up to 11% and almost all plant communities, including conifer forest does not match the commenter's experience, where the foothill yellow-legged frogs were mostly associated with lower gradient streams, often intermittent ones, where adjacent forests were sparser and riparian canopy more open.

Response to Comment 2-2

This RCIS's habitat model for foothill yellow-legged frog was revised to remove stream segments regulated by dams (except for Guadalupe Creek). Model parameters were used to be consistent with the Habitat Plan's model, including the land cover types used to model habitat (ICF International 2012). As described above, the RCIS acknowledges that the habitat models overestimate the actual extent of suitable habitat. However, the habitat models are only intended to be used for planning purposes at the scale of the RCIS area.

The RCIS distinguishes breeding and foraging habitat from low-use habitat based on stream slope. The explanation for why the RCIS uses slopes different from the slopes used in the Habitat Plan was revised to provide more information, as follows: "Foothill yellow-legged frog typically uses streams with slopes of lower gradient (e.g. < 6.5%) (Kupferberg 1996, Ibis Environmental Inc. 2003), and the Habitat Plan (ICF International 2012) defines breeding and foraging habitat as streams with 0-4%

slope. Sections of streams with low gradient slopes were identified as potential breeding and foraging habitat. Initially, NHDPlus Version 2 (McKay et al. 2012) data were used to identify streams with gradients of 0-4% to characterize breeding and foraging habitat. Using this range of slope, many stream lengths known to be occupied by foothill yellow-legged frog were not selected as breeding habitat. The range of slope had to be expanded to 0-11% to capture occupied stream lengths. The use of apparently higher-slope streams to identify breeding and foraging habitat is likely an artifact of the slope data (e.g., inaccuracies), rather than a true reflection of the slopes of streams used by foothill-yellow legged frog for breeding and foraging."

Similarly, an explanation was provided for low-use habitat: "The Habitat Plan identifies moderate gradient streams (4-11% slope) as low-use habitat. Because the RCIS slope data appear to overestimate the slopes of streams, the streams identified as low-use by the Habitat Plan were overlaid onto the RCIS stream layer to identify a range of slope in the RCIS slope data that characterizes streams defined as low-use by the Habitat Plan. This range of slope (11-18%) was then applied to streams outside the Habitat Plan area to define low-use streams for the entire RCIS area."

Comments on Steelhead for the Regional Conservation Investment Strategy

Jerry J. Smith,
Emeritus, San Jose State University

The focal species map for steelhead provides very little real information and guidance for the important steelhead habitat and potential targets for mitigation. Streams that have steelhead or the potential for steelhead are universally indicated throughout their length with the same line that indicates that they have steelhead value. Therefore, if a relatively short reach of habitat upstream provides potential spawning and rearing habitat (of varying value), the entire stream downstream is indicated as steelhead habitat, even though the downstream reaches are important only for upstream passage by adults in winter and downstream passage by smolts heading for the ocean (or SF Bay) in late March through May. Fish passage is also important, but is a distinctly different, and seasonal, habitat issue, while spawning/rearing habitat must be available year round (for up to two years) in order to maintain steelhead. During the 2013-2015 drought adult and smolt passage in winter and spring was crippled due to reservoir operations and low water storage in Stevens, Coyote and Upper Penitencia creeks, putting steelhead at risk of extirpation in those streams even though spawning and rearing habitat was present but unused (Leicester and Smith 2016a and 2016b; Smith 2016). In addition, the numerous partial physical barriers to migration indicated on the map give no indication of those (often few) that significantly constrain adult access or smolt emigration.

For the Valley Habitat Conservation Plan, Jae Abel (Santa Clara Valley Water District, SCVWD) and I updated and improved a previous map we developed of fish associations. That map (attached) indicated two levels of potential spawning/rearing habitat for steelhead: a) a "cool steelhead" zone, where in most years conditions of stream flow, water temperature, and feeding potential are sufficient to potentially support steelhead spawning and also rearing by juvenile steelhead; and b) "potential steelhead" (usually farther downstream of the cool steelhead zone) where conditions are more variable among years or marginal in terms of stream flow and/or water temperature for rearing steelhead (the full descriptions of these associations are given with the map and should be used whenever the map the used). Obviously, downstream of these zones, fish passage for adult and smolt steelhead is a separate issue.

The map that we developed for the Valley HCP was not used, because fish were removed from the HCP, and have no take coverage in the HCP. However, those designations, with some updates, are much more useful for a map for the RCIS. Most of the steelhead habitat within the RCIS boundary is downstream of SCVWD reservoirs (and a Pacheco Creek Water District [PCWD] reservoir for Pacheco Creek), and reservoir operations and stream flow releases are a major factor in the amount and quality of that habitat. As such SCVWD and PCWD operations are not candidates for potential mitigations for transportation or other projects addressed by RCIS, especially since those operations presently have no ESA take coverage, and only Uvas Creek has a modified operation strategy in place to improve conditions for steelhead and is subject to an updated MOA/streambed alteration agreement with the California Department of Fish and Wildlife.

Comments on Individual Streams and Potential Mitigations

Stevens Creek

Based upon sampling in 2013-2016, the map designations for the steelhead spawning/rearing potential should be changed. The downstream extent of the potential steelhead habitat indicated on the map would very rarely (extreme wet years) extend to El Camino Real, as indicated on the map. A more appropriate location would be downstream of the "Fremont drop and fish ladder" (to the east and along Highway 85, downstream of Fremont Avenue). In almost all years streambed percolation will prevent summer stream flow from going much farther. In addition, accretive surface flow from ground water emerges from Middlefield Road downstream; this provides potential steelhead habitat, but is not indicated on the present map. In 2013, steelhead spawned in this lower stream reach (due to difficult adult passage to upstream sites) and juvenile steelhead reared in this reach. This is probably a rare situation, if steelhead are able to ascend father upstream, but the steelhead rearing in the reach in 2013 was significant (Leicester and Smith 2014).

Numerous partial migration barriers are indicated for Stevens Creek, but the major barrier during 2013-2015 was at and immediately downstream of Evelyn Avenue, where low stream flows were diverted into a flat concrete bypass channel that blocked adult and smolt migration. That barrier was significant for adult and smolt migration in 2013-2015, the problem has been has been remedied by SCVWD (Fall 2015). The most significant existing potential physical barrier may be the Fremont Drop and fish ladder, because the tall, narrow fish ladder is prone to clogging with debris and because sediment deposition at the top of the ladder can block flow into the ladder. However, SCVWD reservoir release operations, especially in drier years, are usually the major issue for adult winter passage and smolt spring passage. **No easily-identified and implemented mitigations are apparent, except possibly improvements to the Fremont ladder.**

Guadalupe Watershed

For steelhead, conditions for adult and smolt migration in this watershed are usually better than in Stevens or Coyote creeks, because percolation zones with that lack seasonal surface flow are much more restricted. Physical barriers (other than seasonal stream flow) to fish passage have been addressed. Issues exist for fall Chinook salmon, which attempt to migrate and spawn prior to rains in winter, but those are related to reservoir releases that are directed to ESA-listed steelhead; early releases for Chinook would occur during warm periods, when eggs would likely not survive, and would reduce stored water available to support summer steelhead rearing. **No easily-identified and implemented habitat mitigations for steelhead are apparent.**

<u>Coyote Creek</u>

Reservoir operations are a major factor in controlling steelhead access, spawning, and rearing in Coyote Creek. However, two major addressable structural features presently severely impact steelhead in Coyote Creek. A stream crossing with apron and culverts at Singleton Road (slightly upstream of Capitol Expressway) provides a trail crossing (the road is not open to public traffic). This crossing is a severe barrier to steelhead upstream access under a variety of flow conditions. At lower flows adult steelhead have to jump into and swim through long culverts. At higher flows velocity in the culverts or over the submerged road apron and its steeply inclined downstream surface make passage very difficult. The SCVWD and the City of San Jose are attempting to address the issue, but funding for design and modification are an issue. **This is a logical project for mitigation funding for RCIS projects that might impact Coyote Creek.**

The other major issue for Coyote Creek is the impact of the Ogier Ponds upon potential steelhead rearing habitat downstream of the ponds and upon survival of smolts produced upstream of the ponds, when they migrate through ponds filled with abundant predatory largemouth and spotted bass. The ponds were originally off-channel gravel pits, but became on-channel when Coyote Creek shifted through the ponds during a flood year. The relatively cool releases from Anderson Reservoir maintain suitable rearing habitat downstream to the ponds, but these cooler, heavier waters sink in the ponds and are replaced by warmer, lighter, surface water flowing out of the complex of four ponds. The 4 degree C increase in water temperature below the ponds the quality of habitat for steelhead downstream of the ponds (Smith 2016). If the stream were rerouted around the ponds (in its original channel) habitat for rearing steelhead would be potentially suitable downstream to the Metcalf. The rerouting would also eliminate the predation gauntlet that smolts from upstream must presently run through the ponds. The SCVWD is evaluating taking the ponds off-channel, but they do not own the property. Santa Clara County Parks owns the ponds, but have no funds to conduct such a project**. This is a logical project for mitigation funding for RCIS projects that might impact Coyote Creek.**

A third smaller project might improve habitat conditions in Coyote Creek for steelhead. Spawning gravel abundance and quality have declined downstream of Anderson Reservoir. Spawning gravels could be added in the reach nearest the reservoir. Anderson Reservoir rarely spills (this year being a dramatic exception), so gravels would tend to remain in place for an extended period, compared to similar actions below reservoirs that frequently spill and rinse gravels into pools.

Upper Penitencia Creek

The major issue for steelhead Upper Penitencia Creek (a tributary to Coyote Creek) has been adult and smolt passage through the percolating streambed downstream of Alum Rock Park. Off-channel (pond) and streambed percolation operations by SCVWD help maintain stream flow through much of the percolation zone, when imported water is available (unlike in 2014-2016), but steelhead smolts frequently are blocked by a gap between the park and the percolation operations that cuts off smolt migration in early spring (Leicester and Smith 2016a). **There are presently no structural barriers that are significant problems and potential mitigation projects.**

Uvas Creek

On Uvas Creek, a modified MOA/streambed alteration agreement improved reservoir release strategy to improve conditions for steelhead summer rearing and for adult and smolt passage in winter and spring (Casagrande 2010). The major potential structural impediment to adult steelhead passage is the trestle apron at the Southern Pacific tracks at Bolsa Road. A narrow fish ladder can clog, and streambed down-cutting downstream of the apron has resulted in the ladder entrance being perched above the pool surface. Steelhead must make a difficult jump into the turbulent ladder. At higher flows passage can be difficult over the apron and boulders at its downstream base. **The SCVWD plans to modify the apron, but funding is an issue, provide an opportunity for mitigation for other projects that might affect Uvas Creek steelhead.**

Immediately downstream of Uvas Reservoir, a right (west) bank tributary is a very important steelhead spawning site. Unofficially “Dave’s Creek”, the tributary provides good spawning gravels, which are degraded in the Uvas Creek reach in the first several miles downstream of the reservoir (due to gravel recruitment blocked by the reservoir and sedimentation from turbid reservoir releases). The problem at Dave’s Creek is that stream flow in this tiny stream declines rapidly in spring, often trapping and killing many of the steelhead fry produced. It has been proposed to the SCVWD that a small pipeline from the dam could carry a tiny portion of the reservoir release to the stream to augment the stream flow in spring to allow the fry to survive and move to Uvas Creek (total release to Uvas Creek would not be affected, as the augmented flow would still reach Uvas Creek**). Such a project offers the potential as mitigation for impacts to steelhead in Uvas Creek.**

Operation of a dam and fish ladder on Little Arthur Creek, a tributary farther downstream on Uvas Creek, is subject to passage problems from debris clogging**. Modification or removal of this private dam and ladder might provide for steelhead mitigation in the Uvas Creek watershed.**

Llagas Creek

Llagas Creek has limited potential for a significant steelhead run because the extensive percolating reaches on the valley floor are almost always dry in spring during the potential smolt out-migration.

Pacheco Creek

Almost all of the potential steelhead habitat in Pacheco Creek is provided by releases from North Fork Pacheco Reservoir. Studies in 2013 and 2014 produced a strategy for re-operating the reservoir to improve the release pattern from the reservoir to provide year-round stream flow to portions of the stream and to provide for potential smolt outmigration in most years (Micko and Smith 2016). A steelhead run will depend upon reestablishing an adult run from strays from Uvas Creek and on continuing to implement the reoperation strategy**. There are no other likely habitat modifications that would provide for steelhead mitigation in the watershed.**

LITERATURE CITED

Casagrande, J. M. 2010. Distribution, abundance, growth and habitat use of steelhead in Uvas Creek, CA. M.S. Thesis, San Jose State University.

Leicester, M. A. and J. J. Smith. 2014a. Stevens Creek juvenile steelhead distribution and abundance, summer and fall, 2013. California Department of Fish and Wildlife and San Jose State University.

Leicester, M. A., and J. J. Smith. 2016a. Upper Penitencia Creek Fish Resources in 2016. California Department of Fish and Game and San Jose State University.

Leicester, M. A. and J. J. Smith. 2016b. Stevens Creek Environmental Conditions and Fish Resources in 2016. California Department of Fish and Wildlife and San Jose State University.

Micko, J. and J. Smith. 2016c. Pacheco Creek Reservoir Releases and Environmental Conditions on Pacheco Creek in 2016. Micko Consulting and San Jose State University.

Smith, J. J. 2016. Fish Population Sampling In 2015 on Coyote Creek. San Jose State University.

3. Dr. Jerry J. Smith, Emeritus Professor, San José State University, February 25, 2017

Summary of Comment 3-1

Dr. Smith states that the map of steelhead habitat provides very little real information and guidance for important steelhead habitat and potential targets for mitigation. Dr. Smith recommends using a map he and Jae Able of the Santa Clara Valley Water District developed for the Habitat Plan.

Response to Comment 3-1

An updated version of the map recommended by Dr. Smith was added to the RCIS in place of the previous version of the steelhead habitat map. This map was updated based on feedback from Dr. Smith. See Figure H-1, Appendix H, *Focal Species Habitat Models* for the map and Chapter 2, *Environmental Setting*, Section 2.2.5.3, *Focal Species Profiles* for Central California Coast steelhead and South-Central California Coast steelhead for a description of the map.

Summary of Comment 3-2

Dr. Smith provides comments on individual streams and watersheds and potential mitigations. Streams and watersheds addressed include Stevens Creek, Guadalupe Watershed, Coyote Creek, Upper Penitencia Creek, Uvas Creek, Llagas Creek, and Pacheco Creek.

Response to Comment 3-2

Potential mitigations recommended by Dr. Smith were added as conservation priorities for Central California Coast and South-Central California Coast steelhead conservation priorities (Chapter 3, *Conservation Strategy*, Section 3.6.1.2, *Conservation Priorities*).

March 9, 2018

California Department of Fish and Wildlife
Habitat Conservation Planning Branch
P.O. Box 944209
Sacramento, CA 94244-2090
ATTENTION: Santa Clara County RCIS Comments

Subject: AMBAG Comments on the Santa Clara County RCIS

To Whom It May Concern:

Thank you for the opportunity to review the Draft Santa Clara County Regional Conservation Investment Strategy (SCCRCIS). The following comments are offered for your consideration.

General Comments

AMBAG applauds the Santa Clara Valley Open Space Authority for the development of the SCCRCIS. AMBAG supports regional advance mitigation planning efforts. AMBAG also supports regional conservation investments for mitigation to be implemented in close proximity of a transportation project's impacts.

AMBAG's 2040 MTP/SCS

AMBAG developed the 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) for the Monterey Bay Area region which includes San Benito County. A discussion of MTC's Plan Bay Area is included in Chapter 2: Environmental Setting. Please add the following language to Section 2.1.2 or create a new section 2.1.3 of the SCCRCIS to reflect AMBAG's MTP/SCS.

> AMBAG's 2040 MTP/SCS outlines the region's plan for integrating the transportation network within an overall land use pattern that responds to projected growth, housing needs, changing demographics, and transportation demands. The overall SCS land use development pattern complements the proposed transportation network which emphasizes multimodal system enhancements, system preservation and improved access to high quality transit.
>
> The 2040 MTP/SCS is built on a set of integrated policies, strategies and investments to maintain and improve the transportation system to meet the diverse needs of the region through 2040. Solutions to the AMBAG region's transportation needs require a comprehensive planning effort that coordinates land use patterns and transportation investments with the objective of developing an integrated, multimodal transportation system.
>
> The Monterey Bay Area is projected to grow more slowly than the state and nation. In 2015, there were 755,403 people in the Monterey Bay Area spread over an area of 5,157 square miles. In 2040, the population is expected to reach 883,300. Additionally, there were 262,660 housing units in the region in 2015. The region is expected to add over 42,000 more housing units by 2040 and more than 57,000 new jobs.

P.O. Box 2453 Seaside, CA 93955-2453 [ph] 831.883.3750 [fax] 831.883.3755 http://www.ambag.org info@ambag.org

A strategic expansion of the transportation system is needed to provide the region with the mobility it needs. The 2040 MTP/SCS targets this expansion around mutually supportive bus transit, rail, key roadway and active transportation projects. These transportation systems must be improved and expanded to improve the accessibility and connectivity needed to become a truly viable alternative for the region as a whole.

Transportation

In Section 2.2.2.1, *Transportation Planning*, please add U.S. 101/SR 25 Interchange as an additional highway project.

Additionally, the San Benito County Local Transportation Authority is the transit operator in San Benito County, not the transportation planning agency. San Benito County Council of Governments (SBtCOG) is the transportation planning agency for San Benito County. Please update this section to include a description of SBtCOG responsibilities and transportation planning projects.

Thank you for the opportunity to review and comment on the SCCRCIS. If you have any questions, please contact Heather Adamson, Planning Director, at hadamson@ambag.org or at (831) 264-5086.

Sincerely,

Maura F. Twomey
Executive Director

4. Association of Monterey Bay Area Governments, March 9, 2018

Summary of Comment 4-1

The Association of Monterey Bay Area Governments (AMBAG) applauds the Santa Clara Valley Open Space Authority for the development of the Santa Clara County RCIS.

Response to Comment 4-1

Thank you for AMBAG's support for the Santa Clara County RCIS.

Summary of Comment 4-2

AMBAG requested that a statement provided in the comment letter on AMBAG's 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) be added to Chapter 2, *Environmental Setting*.

Response to Comment 4-2

The description of the 2040 MTP/SCS provided by AMBAG in the comment letter was added to Chapter 2, Section 2.1.3.2, *Transportation*.

Summary of Comment 4-3

AMBAG requested that the U.S. 101/SR 25 Interchange project be listed as an additional highway project in Section 2.1.3.2. The comment also provides additional corrections to transportation-related sections.

Response to Comment 4-3

The U.S. 101/SR 25 Interchange project was added to the list of highway projects in Section 2.1.3.2. San Benito County is no longer in the RCIS area, so corrections to San Benito County transportation agencies no longer apply.

5

COUNTY OF SAN BENITO
BOARD OF SUPERVISORS

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Mark Medina	Anthony Botelho	Robert Rivas	Jerry Muenzer	Jaime De La Cruz
District 1	District 2	District 3	District 4	District 5

March 20, 2018

California Department of Fish and Wildlife
Habitat Conservation Planning Branch
P.O. Box 944209
Sacramento, CA 94244-2090
ATTENTION: Santa Clara County RCIS Comments

Re: Draft RCIS- Comment Letter

To Whom It May Concern:

The Board of Supervisors of San Benito County hereby respectfully submits the following comments for your consideration on the draft Santa Clara County RCIS. The overarching concerns raised below relate to preserving areas for future growth in San Benito County, while recognizing the goals of RCIS. The draft RCIS needs to ensure that San Benito County, by virtue of its lower land costs, does not become used for mitigating development occurring in other jurisdictions, when rightfully such mitigation should occur near the site of development. The comments are submitted as follows: 1

- Add provisions indicating that mitigation lands should be selected in close proximity to the projects which they mitigate.
- The County should have approval authority as to when mitigation lands can be used in San Benito County. 2
- The County should have approval authority as to the maximum number of acres that may be put into mitigation during any one calendar year. 3
- There should be some mechanism for insuring long-term fiscal neutrality to San Benito County when lands being placed in permanent mitigation in a manner which results in a lower assessed value. The County recognizes that this is a more difficult issue to solve, given the nature of the RCIS document; however, this issue should be considered along 4

with the merits of capping the number of acres placed into mitigation each year in each individual jurisdiction without that jurisdiction's approval.

Unless each of the foregoing items is fully addressed, the Board has deep reservations regarding the inclusion of any land within San Benito County in the Santa Clara RCIS. Identification of mitigation lands, and subsequent placement of a conservation easement on those lands, is a major land use decision that must involve review and consent by the Board. The County is concerned this new environmental constraint could potentially be used by agency staff or advocacy groups to try to litigate against, delay or block, or impose more onerous permit requirements, on any lands within San Benito County. We also believe there was insufficient consultation with the 5
County about including any County lands within the RCIS planning area boundaries, and regarding the draft RCIS.

We believe the RCIS should not be approved as proposed; however, we would be willing to work together to assure that the next draft RCIS addresses our concerns, and could thereafter consider supporting the RCIS.

Since ly,

Anthony Botel o, Chairman

By mail and by email to: rcis@wildlife.ca.gov, RCIS@openspaceauthority.org

5. County of San Benito, Board of Supervisors, March 20, 2018

Summary of Comment 5-1

The overarching concern raised by the County of San Benito Board of Supervisors (Board) is that implementation of the RCIS could affect land use (including future growth) in San Benito County by facilitating the use of San Benito County lands to provide mitigation for projects in other jurisdictions, such as Santa Clara County. More specifically, the Board emphasizes that mitigation lands should be selected in close proximity to the projects which they mitigate.

Response to Comment 5-1

The Santa Clara Valley Open Space Authority (Authority) and the Santa Clara County RCIS Steering Committee (Steering Committee) respectfully acknowledge the concerns of the Board of Supervisors of San Benito County, as described in the Board's Public Draft RCIS Comment Letter, March 20, 2018.

The Authority elected to remove San Benito County from the RCIS area on May 1, 2019 at the request of the Board in a letter submitted to the Authority and CDFW on April 16, 2019 requesting that San Benito County be removed from the RCIS area.

As summarized in Table 1-2, Section 1.4, *Public Outreach and Involvement*, the Authority met multiple times with members of the Board, San Benito County Planning, San Benito County Executive's Office, San Benito County Counsel, and the San Benito County Council of Governments to address the County of San Benito, Board of Supervisors' concerns. Despite these efforts, the Authority and CDFW could not alleviate the Board's concerns.

Regardless of whether San Benito County is in the Santa Clara County RCIS area, and based on longstanding precedent, permitting agencies are likely to require compensatory mitigation to be located at biologically appropriate sites which are often near where project impacts occur to ensure such impacts are effectively mitigated. Projects are usually required to mitigate within the same county, watershed, or ecological region, though biologically superior mitigation farther away is sometimes preferred to inferior mitigation that is closer to the impact area. Having flexibility in where to site mitigation gives project proponents access to a mitigation marketplace that can speed up project delivery. To limit projects to mitigation opportunities only within their own county could slow down the project approval process due to limited supply and result in biologically inferior mitigation that is of lower conservation value.

The RCIS is a non-regulatory, voluntary, non-binding conservation strategy. The RCIS can be used to guide voluntary conservation investments (e.g., habitat protection and habitat enhancement actions voluntarily implemented by private landowners, local government agencies and non-profit organizations) and to fulfill, in whole or in part, compensatory mitigation requirements established under any state or federal environmental law, as determined by the applicable local, state, or federal regulatory agency," including the California Environmental Quality Act (CEQA), and Lake or Streambed Alteration requirements of the CFGC and other state and federal environmental laws.[4]

[4] CFGC 1856(c)(1-3)

The Santa Clara County RCIS is intended to benefit private landowners, as well as infrastructure agencies and the development industry, by enabling the creation of credits through *mitigation credit agreements* (MCA). An MCA is an agreement between CDFW and one or more persons or entities that identifies the types of conservation actions (e.g., protecting land through an agricultural or conservation easement) or habitat enhancement actions (e.g., growing economically viable crops managed in ways that also provide important habitat for sensitive species) that would be implemented under the agreement. The person or entity creating credits can use those credits as compensatory mitigation, if needed, or sell or transfer those credits to a person or entity in need of compensatory mitigation credits.

Summary of Comment 5-2

The Board comments that it should have approval authority as to when mitigation lands may be used within San Benito County.

Response to Comment 5-2

As noted above, the Authority elected to remove land within San Benito County for this RCIS. This decision does not influence whether the Board should have approval as to when mitigation lands may be used within San Benito County: the RCIS cannot dictate what any land use or permitting authority requires for mitigation. Also, the RCIS cannot designate land use approval authority, including the approval of San Benito County lands for use as mitigation, to any land use agency or jurisdiction. As such, the RCIS would not change existing land use policies and regulations.

As stated in the Santa Clara County RCIS, Chapter 1, *Introduction*, Section 1.1, *Background*, "[a]doption of this RCIS by CDFW is consistent with CFGC 1850(e) and 1852(c)(7). By authorizing CDFW to approve RCISs, it is not the intent of the California State Legislature to regulate the use of land, establish land use designations, or to affect, limit, or restrict the land use authority of any public agency. Nothing in the Santa Clara County RCIS is intended to, nor shall it be interpreted to conflict with state law or local ordinances. Therefore, actions carried out as a result of this RCIS will be in compliance with all applicable state and local requirements." It is the choice of private landowners to voluntarily put their land into conservation easement or use their land for mitigation purposes.

Summary of Comment 5-3

The Board comments that the San Benito County should have approval authority as to the maximum number of acres that may be put into mitigation during any one calendar year.

Response to Comment 5-3

As noted above, the Authority elected to remove land within San Benito County for this RCIS.

Removing San Benito County from the RCIS area does not affect whether San Benito County has approval authority over the use of San Benito County land for mitigation and the maximum number of acres that may be put into mitigation. Please see response to comment 5-2 regarding the use of an RCIS to regulate land use, establish land use designations, or affect, limit, or restrict the land use authority of any public agency. Because this RCIS (or any RCIS) cannot regulate the use of land, establish land use designations, or affect, limit, or restrict the land use authority of any public agency, it cannot provide approval authority as to the maximum number of acres that may be put into mitigation during any one calendar year.

Summary of Comment 5-4

The Board comments that there should be some mechanism to insure long-term fiscal neutrality to San Benito County. While recognizing that this is a more difficult issue to resolve, the Board comments that this issue should be considered along with the merits of capping the number of acres placed into mitigation each year in each individual jurisdiction without that jurisdiction's approval.

Response to Comment 5-4

Please see response to comment 5-2 regarding the use of an RCIS to regulate land use, establish land use designations, or affect, limit, or restrict the land use authority of any public agency. Because this RCIS (or any RCIS) cannot regulate the use of land, establish land use designations, or affect, limit, or restrict the land use authority of any public agency, it cannot provide a mechanism for insuring long-term fiscal neutrality to San Benito County when lands being placed in permanent mitigation results in a lower assessed value.

Summary of Comment 5-5

The Board comments that unless the items mentioned in the letter are fully addressed, the Board has deep reservations regarding the inclusion of any land within San Benito County in the Santa Clara County RCIS. The Board also believes there was insufficient consultation with San Benito County about including any County lands within the RCIS area and drafting the RCIS.

Response to Comment 5-5

The Authority and the Santa Clara County RCIS Steering Committee respectfully acknowledge the Board's reservations regarding the inclusion of land within San Benito County in the Santa Clara County RCIS area, as well as the Board's concern that there was insufficient consultation with the County about including San Benito County lands within the RCIS area.

As described above in response to comment 5-1, the Authority elected to remove San Benito County from the RCIS area on May 1, 2019 at the request of the Board in a letter submitted to the Authority and CDFW on April 16, 2019 requesting that San Benito County be removed from the RCIS area.

The RCIS identifies opportunities for voluntary conservation of agricultural and other natural resources while assisting development and infrastructure project delivery. The Santa Clara County RCIS is not intended to be an environmental constraint, as the RCIS is intended to inform voluntary conservation investments and areas that can provide compensatory mitigation for impacts to species and natural resources.

Representatives of the RCIS Steering Committee met with Brent Barnes, Director, San Benito County Natural Resource Agency, and Mary Gilbert, San Benito Council of Governments, on October 4, 2016 to discuss the RCIS. Authority staff also reached out to the Board of Supervisors in spring 2018 before submission of the Final Santa Clara County RCIS was submitted.

The Authority and the Santa Clara County RCIS Steering Committee appreciates the Board's willingness to work together to address the Board's concerns. As summarized in Table 1-2 in Chapter 1, *Introduction*, Section 1.4, *Public Outreach and Involvement*, the Authority meet multiple times with members of the Board, San Benito County Planning, San Benito County Executive's Office, San Benito County Counsel, and the San Benito County Council of Governments to address the County of San Benito, Board of Supervisors' concerns. Despite these efforts, the Authority and CDFW could not alleviate the Board's concerns addressed in the Board's comment letter.

Subject: Comments on December 2017 Public Draft of Santa Clara County Regional Conservation Investment Strategy
From: "D. Muirhead" <doug.muirhead@stanfordalumni.org>
To: rcis@wildlife.ca.gov
Cc: RCIS@openspaceauthority.org
Date: Wednesday, March 21, 2018 9:53:12 PM GMT 07:00

Comments submitted by Doug Muirhead,
City of Morgan Hill, County of Santa Clara, on the December 2017 Public Draft of the Santa Clara County Regional Conservation Investment Strategy CDFW: rcis@wildlife.ca.gov
Authority: RCIS@openspaceauthority.org
+ + + + + + + +

[Comment #1]
[Text] 1.4 Public Outreach and Involvement CFGC 1854(c)(3)(A) requires that the public agency preparing an RCIS ... hold a public meeting to allow interested persons and entities to receive information ... and to have adequate opportunity to provide written and oral comments. ... Consistent with this requirement, a public meeting was held on December 8, 2016 at Santa Clara Valley Open Space Authority offices in San Jose, California. ... Interested persons were invited to provide oral and written comments to the Authority. The public meeting was held as part of a regularly scheduled Board of Directors meeting. CFGC 1854(c)(3)(B) requires that in a draft RCIS submitted to CDFW for approval, the public agency shall include responses to written public comments submitted during the public comment period. Appendix C Public Outreach Responses to Public Comments This is a placeholder for public comments that will be received during the public review period. No written comments were received during or after (i.e., within 60 days) the public meeting held on December 8, 2016. [Comment] I attended the public meeting on December 8 and provided oral comments. No warning was given that oral comments would be treated differently than written comments, i.e. not recorded and responded to. Having made oral comments, I did not repeat them in writing. + + + + + + + +

[Comment #2]
[Text] 3.2.1 Conservation Goals and Objectives The Program Guidelines recommend that conservation objectives be achievable within the 10 year lifespan of the initial approval of the RCIS. The conservation objectives in this Santa Clara County RCIS, however, do not have a deadline because of the uncertainty in the pace of implementation. Conservation objectives that have no deadline also minimize the revisions necessary when the RCIS is amended or extended. [Comment] Lack of any deadline prevents determination of progress and removes any sense of urgency. The second reason to "minimize revisions" is just lazy. + + + + + + + +

[Comment #3]
[Text] 3.6.1 Central California Coast and South Central California Coast Steelhead, 3.6.1.2 Conservation Priorities [Comment] I would prefer a much stronger linkage to work being done by the Santa Clara Valley Water District. See Asset Management Program Update 3/27/2018: Summary of Creeks with Completed Level of Service (LOS), Maintenance Guidelines (MG), and Asset Management Plans (AMP). See Stevens Creek Fish Passage Analysis Project, also on SCVWD Board agenda for 3/27/2018. See Fisheries and Aquatic Habitat Collaborative Effort (FAHCE, 2003), which deals with steelhead and salmon in the Guadalupe River, Coyote Creek and Stevens Creek watersheds. + + + + + + + +

[Comment #4]
[Text] 3.6.2 California Tiger Salamander Conservation Action CTS 7. Incorporate measures in management and monitoring plans to ensure ranaviruses, chytrid fungus, or other pathogens are not introduced to California tiger salamander habitat. Measures include ensuring that pathogen

hosts (i.e., hybrid salamanders, fish species) are not introduced, and protocols for sterilization of field equipment (U.S. Fish and Wildlife Service 2017). [Comment] In a presentation to OSA by Santa Clara County Parks Deputy Director Rocha, a key vector for transmitting invasive species are firefighting crews.

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[Comment #5]
[Text] 3.6.5 Tricolored Blackbird
Conservation Action TCBL 10. Incentivize (e.g., through agricultural easements or by purchasing crops) private landowners to manage agricultural land to provide suitable foraging habitat.
[Comment] I have never heard of the option of purchasing crops. Is this to compensate for otherwise uneconomic crops? Or to make profitable a crop that lacks access to markets? Or simply to supply a crop that has other beneficial uses in the area?

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[Comment #6]
[Text] 3.6.7 Swainson's Hawk
Conservation Action SWHA 4. Cease any use of rodenticides on protected lands, except where needed to retain structural integrity of infrastructure (e.g., earthen dams).
[Comment] How will you respond to policy changes by regulatory agencies? For example, U.S. Army Corps of Engineers proposed policy on VegetationFree Zone on Levees and Floodwalls.

\+ + + + + + + +

[Comment #7]
[Text] 3.6.7 Swainson's Hawk
There are ample opportunities for the species to expand its nesting range within the RCIS area, particularly if crop types are planted that provide suitable foraging habitat.
[Text] 3.9 Monitoring and Adaptive Management Framework Monitoring and adaptive management plans will only be required for conservation actions or habitat enhancement actions that are implemented under MCAs.
[Comment] Do you plan any monitoring or warning triggers for conversion from row/grass crops to orchards? Perhaps based on well permits or information from Farm Bureaus or Agricultural Commissioners? + +

\+ + + + + +

[Comment #8]
[Text] 2.3.5.3 Focal Species Profiles
The following species profiles summarize the regulatory status, distribution in the RCIS area, and habitat requirements for the focal species. [Comment] I found the Life History and Ecological Requirements to be more readable than similar Species Profiles in the Habitat Conservation Plan. I recommended them to the Habitat Agency, and will recommend them to County Parks. Too many agencies talk about protecting species without helping the non professional understand what that entails. + + + + + + +

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[Comment #9]
[Text] Appendix B Regulatory Processes
[Comment] I don't know if the high level overview of regulatory agencies from this RCIS or the one from the Santa Clara Valley Habitat Plan, August 2012, 1.3 Regulatory Setting, is preferred for the non professional. Perhaps a combination of the two.
I do really like the section on
Water Quality Objectives for Use in Designing and Implementing Projects

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with Impacts on Creeks or Wetlands
Table B-1. Watershed Hydrology Goals for Stream and Wetland System
           Functions
Table B-2. Stream Dynamic Equilibrium Goals for Stream and Wetland
           System Functions
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Table B-3. Stream and Wetland System Habitat Integrity Goals for Stream and Wetland System Functions

6. Doug Muirhead, City of Morgan Hill, County of Santa Clara, March 21, 2018

Summary of Comment 6-1

This comment states that at the public meeting held December 8, 2016, no warning was given that oral comments would not be recorded or addressed. Mr. Muirhead states that he made oral comments but did not repeat them in writing.

Response to Comment 6-1

Mr. Muirhead's oral comment and a response to his comment from the Santa Clara County RCIS Steering Committee is include in the Oral Comment Section in this Appendix.

An announcement was made at the beginning of the Santa Clara County RCIS session of the public meeting that responses will be provided to written comments only, and that comments could be written on the comment card provided by the Santa Clara Valley Open Space Authority (Authority) next to the door. It was also stated that written comments should be sent to the Authority by December 16, 2016.

Summary of Comment 6-2

Lack of a deadline to achieve conservation objectives prevents determination of progress and removes any sense of urgency. The second reason to "minimize revisions" is just lazy.

Response to Comment 6-2

The Steering Committee acknowledges the value of having time-bound objectives; however, the Steering Committee elected to have quantitative objectives that reflect a desired state of conservation in the RCIS area, rather than what could be achieved within 10 years. Progress can still be assessed by comparison with baseline conditions (e.g., the amount of protected riparian habitat in 2029 compared to 2019, and the amount habitat that needs to be protected to achieve the objective). The statement that "(c)onservation objectives that have no deadline also minimize the revisions necessary when the RCIS is amended or extended" was deleted.

Summary of Comment 6-3

The comment states a preference for a much stronger linkage to work being done by the Santa Clara Valley Water District and references relevant projects and efforts.

Response to Comment 6-3

The following statement was added to the Central California Coast and South-Central California Coast Steelhead conservation priorities (Chapter 3, *Conservation Strategy*, Section 3.6.1.2, *Conservation Priorities*) to emphasize the importance of the Santa Clara Valley Water District's role in improving habitat for steelhead: "Work with Caltrans, California Department of Fish and Wildlife, National Marine Fisheries Service, Santa Clara Valley Water District, and other interested parties to implement habitat improvement projects and remove or modify barriers to fish passage. Recent and ongoing work by the Santa Clara Valley Water District and other entities should be used to identify priority sites for habitat improvement actions such as gravel augmentation and placement of large woody debris (LWD) (Balance Hydrologics 2018) and removal or modification of barriers to fish passage (e.g. Domenichelli & Associates Civil Engineering 2017)."

This passage references the Study of Santa Clara Steelhead Streams to Identify Priority Locations for Gravel Augmentation and Large Woody Debris Placement, prepared for the Santa Clara Valley Water District (Balance Hydrologics 2018) and the Stevens Creek Steelhead Passage Improvement Project Feasibility Report, funded in part by a grant from the Santa Clara Valley Water District (Domenichelli & Associates Civil Engineering 2017).The RCIS's Central California Coast and South-Central California Coast Steelhead conservation strategy is also informed by the South-Central California Coast Steelhead Recovery Plan (National Marine Fisheries Service 2013) and Final Coastal Multispecies Recovery Plan (National Marine Fisheries Service 2016), which incorporates work done by (and for) the Santa Clara Valley Water District and the Fisheries and Aquatic Habitat Collaborative Effort (for the Coastal Multispecies Plan).

Summary of Comment 6-4

The comment states that in a presentation to the Authority, Santa Clara County Parks Deputy Director Rocha identified firefighting crews as a key vector for transmitting invasive species.

Response to Comment 6-4

Comment noted. CTS-8 (formerly CTS-7), which recommends that measures are incorporated in management and monitoring plans to ensure ranaviruses, chytrid fungus, or other pathogens are not introduced to California tiger salamander habitat would apply to firefighting crews.

Summary of Comment 6-5

The comment asks about the purpose for purchasing crops to provide suitable foraging habitat for tricolored blackbird.

Response to Comment 6-5

Tricolored blackbird in the San Joaquin Valley frequently nest in grain crops grown for silage. In many cases, harvest has caused reproductive failure for the entire colony due to destruction of eggs and nestlings. Paying farmers to delay harvest until after young have fledged is a strategy used to protect colony reproductive success (California Department of Fish and Wildlife 2018).

TRBL-9 was deleted because tricolored blackbird does not nest in silage crops in the RCIS area (UC Davis 2017) and silage crops are not commonly grown in the RCIS area (Santa Clara County 2017).

Summary of Comment 6-6

Conservation Action SWHA-4 recommends ceasing use of rodenticides on protected lands except where needed to retain structural integrity of infrastructure. The comment asks how we will respond to policy changes by regulatory agencies.

Response to Comment 6-6

The Santa Clara County RCIS is a voluntary, non-binding conservation strategy, so there the RCIS cannot restrict the use of rodenticides on protected lands. It is assumed that this and all other conservation actions will only be implemented as allowed by laws and regulations.

Summary of Comment 6-7

The comment asks if monitoring or warning triggers for conversion from row/grass crops to orchard are planned.

Response to Comment 6-7

The monitoring and adaptive management strategy is primarily intended to provide an overview of monitoring and adaptive management and describes the framework that can be used to inform the monitoring and adaptive management plans used in an MCA in the RCIS area. As such, the RCIS does not include a plan to monitor conversion of row/grass crops to orchards.

Summary of Comment 6-8

The comment states that the *Life History* and *Ecological Requirements* sections in the focal species profiles (Chapter 2, *Environmental Setting*, Section 2.2.5.3) are more readable than similar species profiles in the Santa Clara Valley HCP/NCCP and recommends them to the Santa Clara Valley Habitat Agency.

Response to Comment 6-8

Thank you for your feedback on the focal species profiles.

Summary of Comment 6-9

The commenter likes the section on *Water Quality Objectives for Use in Designing and Implementing Projects with Impacts on Creeks or Wetlands* in Appendix B, *Regulatory Processes*.

Response to Comment 6-9

Thank you for your feedback on this section in Appendix B.

Celebrate our 25th Anniversary with us!

Please print only if necessary.

From: Thomas O'Neill <habitat@thehabitatinstitute.org>
Sent: Thursday, March 22, 2018 10:57 AM
To: rcis@wildlife.ca.gov; RCIS@openspaceauthority.org
Subject: Santa Clara County draft Regional Conservation Investment Strategies (RCIS)

Dear Reader: Regarding the Santa Clara County RCIS, we have a couple of comments. First, no mitigation method that meets the intent of Assembly Bill 2087 is listed or explained how a consistent metrics is determined for use in advance mitigation; legislation specific intent is listed as "to promote science-based conservation to guide compensatory mitigation for impacts to natural resources, including impacts to threatened and endangered species, other sensitive species, natural communities, ecological processes, and connectivity." Next, under the compensatory mitigation section there is no mitigation approach cited that would be used to adequately evaluate these habitats. The Santa Clara RCIS mainly offers a discussion on the need to use watersheds for an evaluation and they cite the Corps & EPA regulations. But there is no discussion of their prior mitigation MOA that states for wetlands the Corps will strive to achieve a goal of no overall net loss of values and functions. A number of Corps projects are using the Institute's CHAP to evaluate values and functions. Lastly, inclusion of other species does not seem to be adequately addressed. The methodology should include all potential species as well as identifying focal or species of interest. These later species would need to be broken out and discussed in terms of baseline conditions and based on alternative scenarios for habitat enhancements any incremental gains for these species. [also see comment about Habitat Quality definition].

At issue is the following section within AB 2087, 1854 (e) "the Dept. shall require the use of consistent metrics that incorporate both area and quality of habitat and other natural resources … this statement looks to create a mitigation metric(s) that is a habitat unit(s).. The whole purpose is to address mitigation that is in step with a regional conservation strategy. The Santa Clara RCIS does a reasonable approach though the regional scale, which is slightly larger than a Santa Clara County is small compared to how we would read the AB 2087 language. This part also seems confused in the guidelines (see below).

CDFW Guidelines would benefit from addressing several definitions that are not clear or scientifically current and are need of updating. They are region, habitat, and ecosystem functions.

Region - The purpose of AB 2087 is to develop goals and objectives at a regional scale(4) and the guidelines are confusing on this subject. For instance, AB 2087 defines "Regional level" (see e.g. Figures 3 & 4) as relevant ecologically defined units such as ecoregions. Though the first RCIS submitted is Santa Clara County and the area it encompasses is slightly bigger than its county, which is a political subdivision. The guidelines do identify the USDA Ecoregional Section or sub-ecoregions, which is fine but then goes to include USGS HUCs (defined on p 3-3 HUC-4 or HUC-8 units; on p 4-5 HUC 10 or HUC 12). Now if the USGS HUCs are to be included then the equivalent would only go as high as the HUC – 6 units; HUC-8, HUC-10, and HUC-12 are not appropriate for a regional context. These later HUC levels are more appropriate to define a site and its landscape context.

Habitat - Habitat basic definition is OK, but the qualifier at the end of the definition is inappropriate in that ***Habitat IS NOT synonymous with vegetation communities***. This is a misunderstanding and use of the term. Additionally, the California Wildlife Habitat Relationship habitat types should be cited as the example.

Habitat Quality [in the Santa Clara definitions Appendix A, p. A-5) – this definition is built around a single species concept and needs revision. We live in a multi-species world driven by single species; multiples species need to be included. The definition of habitat quality is basically on an ordinal scale of either high or low. Habitat quality is better defined on a continual scale otherwise how does one show incremental increases do to habitat enhancements? Our CHAP approach defines it on a continual scale that can also be included into an economic assessment.

Ecosystem Functions – Definition gives examples that are to narrow should also include how organisms influence their environment by aerating soil, creating caveats, and distributing seeds.

Should define in guidelines:

Baseline Condition - this is because it is an important comparison for determining incremental gains.

Thank you for the opportunity to comment.

Very Best,

Thomas O'Neill
The Habitat Institute
Corvallis, OR 541-753-2199
Capitola, CA 831-212-2402
www.habitatinstitute.org

7. The Habitat Institute, March 22, 2018

Summary of Comment 7-1

The comment states that "no mitigation method that meets the intent of Assembly Bill 2087 is listed or explained how a consistent metric is determined for use in advance mitigation…"

Response to Comment 7-1

The RCIS is intended to *guide* voluntary conservation investments and compensatory mitigation for impacts to ecological resources[5], rather than to provide a "mitigation method." The Santa Clara County RCIS identifies conservation actions, habitat enhancement actions, and conservation priorities that can be implemented to "fulfill compensatory mitigation requirements established under any state or federal environmental law, as determined by the applicable local, state, or federal regulatory agency" (Assembly Bill 2087, Legislative Counsel's Digest). Chapter 4, *Implementation*, Section 4.4.2, *Mitigation Credit Agreements* provides an overview of how mitigation credits can be created through an MCA in the RCIS area.

CDFW may require the use of consistent metrics in MCAs to measure, through monitoring efforts, the net change resulting from the implementation of conservation actions and habitat enhancement actions for the focal species and other conservation elements with mitigation credits.

The RCIS proponent (i.e., the Santa Clara Valley Open Space Authority [Authority]) will evaluate the effectiveness of this RCIS's conservation actions, habitat enhancement actions, and progress towards achieving this RCIS's goals and objectives at least once every 10 years in a report submitted to CDFW at the end of the 10-year approval term. Alternatively, the contents of this progress report will be included in the updated Santa Clara County RCIS submitted to CDFW for renewal after the 10-year approval period has ended. As described in Section 4.2.2.1, *RCIS Progress Report*, the progress report or updated RCIS will summarize the following.

- The net change in the amount of protected habitat in the RCIS area. The net change in area should be provided in acres, though for certain ecological features, net change may be provided in other relevant metrics (as specified in the MCA), such as length and width of a restored riparian woodland.
- A summary of the net change in quality of the target focal species' habitat and other conservation element(s) addressed by conservation or habitat enhancement actions on the MCA sponsor's mitigation sites in the RCIS area, using the metrics identified in the MCA(s).

Summary of Comment 7-2

The comment states that "under the compensatory mitigation section there is no mitigation approach cited that would be used to adequately evaluate these habitats." The comment also explains that there is no discussion about how the U.S. Army Corps of Engineers will strive to achieve the goal of no net loss of values and functions for wetlands.

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[5] CFGC 1850(a).

Response to Comment 7-2

The comment is assumed to be referring to the *Compensatory Mitigation Approach* section in Appendix B, *Regulatory Processes*. As described in the introduction to Appendix B, the purpose of the appendix is to provide a brief overview of the permitting agencies and key regulations that may require mitigation that can be informed by this RCIS. It is not the intent of this appendix or the RCIS to present a method for evaluating wetlands, habitats, natural communities, or other conservation elements. If the RCIS is used to guide compensatory mitigation to offset loss of wetlands, it is assumed that the responsible regulatory agencies will determine the appropriate method to evaluate wetlands.

Summary of Comment 7-3

This comment provides a quote that states that the legislation's specific intent is "to promote science-based conservation to guide compensatory mitigation for impacts to natural resources, including impacts to threatened and endangered species, other sensitive species, natural communities, ecological processes, and connectivity."

The comment also states that the inclusion of other sensitive species does not seem to be adequately addressed, and that the RCIS should include all potential species as well as focal species.

Response to Comment 7-3

The exact quote of Assembly Bill 2087 provided in the comment letter could not be found in Assembly Bill 2087. The comment appears to reference the following section from AB 2087.

> 1850. (a) The Legislature finds and declares that it would be beneficial to identify species and habitat conservation initiatives at a regional scale, including actions needed to address the impacts of climate change and other wildlife stressors, in order to guide voluntary investments in conservation, and compensatory mitigation for impacts to ecological resources, including impacts to threatened and endangered species, other sensitive species, natural communities, ecological processes, and wildlife corridors.

It is assumed that the intent of the legislature is to allow RCISs to address sensitive species that aren't necessarily state or federally listed as threatened or endangered, rather than address "all potential species as well as identifying focal or species of interest," as stated in the comment.

The RCIS includes as focal species three wildlife species and six plant species that aren't state or federally listed (Tables 2-6 and 2-7). The RCIS also addresses three non-focal wildlife species and one non-focal plant species that aren't state or federally listed (Chapter 2, *Environmental Setting*, Section 2.2.6, *Non-focal Species* and Appendix F, *Non-focal Species Summaries*).

Summary of Comment 7-4

This comment states that the purpose of (presumably) Assembly Bill 2087 is to "address mitigation that is in step with a regional conservation strategy."

Response to Comment 7-4

See Response to Comment 7-1, which explains how metrics may be used to assess the net change in the amount of protected habitat in the RCIS area and the net change in quality of a focal species' habitat and other conservation element(s) using metrics identified in the relevant MCA.

Summary of Comment 7-5

This comment states that the Program Guidelines would benefit from addressing definitions for "region," "habitat," "habitat quality," and "ecosystem function" that are not clear or scientifically current and in need of updating. The comment also recommends that the Program Guidelines should define "baseline condition."

Response to Comment 7-5

The RCIS uses the terms and definitions provided in the June 2017 Program Guidelines (California Department of Fish and Wildlife 2017). CDFW is responsible for the terms and definitions in the Program Guidelines, including the definitions of habitat, habitat quality, and ecosystem function.

From:	Thomas O"Neill
To:	Joelle Garretson; rcis@wildlife.ca.gov
Subject:	Santa Clara County draft Regional Conservation Investment Strategies (RCIS)
Date:	Friday, March 23, 2018 10:57:57 AM
Attachments:	image001.png

Hello Joelle & CDFW Staff: as part of our comments yesterday I would like to include the following statement that the CHAP method uses a systematic approach to develop consistent mitigation metrics as called for in AB 2087. In addition, Santa Clara Water District in conjunction with the Corps of Engineers and US Fish and Wildlife Service has used the Institute's CHAP method to determine baseline conditions for Penitencia Creek that lies within Santa Clara County. So, we would recommend that the Santa Clara County RCIS consider using the CHAP approach to address their habitat evaluations and mitigation needs.

Very Best,,

Thomas O'Neill
The Habitat Institute
Corvallis, OR 541-753-2199
Capitola, CA 831-212-2402
www.habitatinstitute.org

Joelle Garretson
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8. The Habitat Institute, March 23, 2018

Summary of Comment 8-1

This comment adds to The Habitat Institute's comments from the previous day that the Habitat Institute's Combined Habitat Assessment Protocols (CHAP) method uses a systematic approach to develop consistent mitigation metrics as called for in Assembly Bill 2087. The comment recommends that the RCIS consider using the CHAP approach to address habitat evaluations and mitigation needs.

Response to Comment 8-1

Thank you for your recommendation that the Santa Clara County RCIS consider using the CHAP approach to address habitat evaluations and mitigation needs. The RCIS uses existing information and data to assess habitat at the scale of the RCIS area (e.g., land cover data for natural communities [Chapter 2, Section 2.2.4, *Natural Communities and Land Cover*] and habitat distribution models for focal species [Chapter 2, Section 2.2.5.2, *Habitat Distribution Models*]). As described on The Habitat Institute's CHAP website,[6] the CHAP method involves field inventories. Conducting field inventories to inform the RCIS is beyond the scope of this RCIS. Individuals or organizations evaluating sites for conservation investments or creating MCAs, however, may consider using the CHAP method for site-specific assessments. If the CHAP method is used to assess MCA sites, the RCIS recommends consulting with CDFW to determine if the CHAP method is suitable for the MCA.

[6] https://www.habitatinstitute.org/scientific-method/chap/

Date: April 11, 2018

Subject: U. S. Fish and Wildlife Service (Service) comments on the Draft Santa Clara County Regional Conservation Investment Strategy (RCIS)

Regional Contact: Bronwyn Hogan Bronwyn_hogan@fws.gov 916-287-1446

Overall comments:

The RCIS fills information gaps and has the potential to be a very useful tool in developing mitigation plans, conservation or mitigation banks, in-lieu fee programs, or permittee-responsible mitigation projects. The document makes some assumptions concerning its interchangeability with existing standards and practices with regard to compensatory mitigation under the Endangered Species Act (ESA); especially conservation and mitigation banking and in-lieu fee programs. However, the information that has been presented is not consistent with current standards and practices developed by the Service (see 81 FR 95316, Dec. 27, 2016 and *Interim Guidance on Implementing the Final Endangered Species Act Compensatory Mitigation Policy*, Jan. 17, 2017), nor is it consistent with current statewide practices developed under the Memorandum of Understanding Concerning Mitigation and Conservation Banking and In-lieu Fee Programs in the State of California (2011), between several federal and state agencies including the Service and the California Department of Fish and Wildlife and its parent agency, the California Natural Resources Agency. This ongoing collaborative process has resulted in the bank enabling instrument and conservation easement templates used by all of the signatory agencies in the State of California. We recognize that RCIS-specific Mitigation Credit Agreement guidance has not yet been published, but we anticipate that it will reflect the practices mentioned above and would strongly encourage this RCIS to make the MCA process outlined in the document consistent with those practices.

Specific comments:

There are a number of comments that reflect information that was not incorporated in the draft RCIS. A list of references and citations used in the comments in included at the end of this document. The comments pertaining to mitigation in the table are intended to address the gaps between what is presented in the RCIS and current standards and practices used by the Service in evaluating sites proposed as mitigation for unavoidable impacts to species listed under the ESA. In addition, after the table there is a comment about nitrogen deposition that could be applied in a number of places in the document, so was not included with a specific location. Please let us know if you need more information regarding that (or any other) comment.

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
Table 1-4	Existing Recovery and Other Conservation Plans	Should also reference the *Recovery Plan for Upland Species of the San Joaquin Valley, California* which covers the San Joaquin kit fox and include measures from that recovery plan in the conservation strategy for the San Joaquin kit fox in the Santa Clara RCIS (https://ecos.fws.gov/docs/recovery_plan/980930a.pdf, U.S. Fish and Wildlife Service (USFWS) 1998). Updated information on threats to and recovery priorities for the San Joaquin kit fox is available in the five-year review for the San Joaquin kit fox (https://ecos.fws.gov/docs/five_year_review/doc3222.pdf, USFWS 2010).
p. 2-11	Conservation and Mitigation Banks	The Pleasanton Ridge Conservation Bank is currently suspended and thus cannot provide any credits for the California red-legged frog. The Sparling Ranch Conservation Bank offers credits for ***both*** California tiger salamander and California red-legged frog (not just California tiger salamander as stated in the RCIS document).

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
p. 2-77	San Joaquin kit fox habitat model, "All areas within 656 feet of highways were excluded from the model as habitat."	Is the exclusion of all areas within 656 feet of highways as suitable San Joaquin kit fox habitat specifically for the purpose of determining areas suitable for preservation/mitigation, or will the exclusion of these areas also mean that projects disturbing habitat within 656 feet of highways will not be required to mitigate for effects to San Joaquin kit fox? If the former, USFWS agrees with prioritizing mitigation lands away from highways. If the latter, that means that the Santa Clara RCIS anticipates that almost none of the highway improvement projects will ever have to mitigate for San Joaquin kit fox even though highways are one of the primary threats to San Joaquin kit fox dispersal. This would exclude from mitigation requirements highway improvements/widening along the Highway 152 corridor in southeastern Santa Clara County where most San Joaquin kit fox in the Santa Clara RCIS are most likely to disperse (especially given that highways are typically built on valley bottoms and the lowest slope gradients where San Joaquin kit fox are most likely to disperse instead of the steeper slopes and ridges further away from highways). This is not consistent with the Santa Clara Valley Habitat Plan (SCVHP) modeled habitat and mitigation requirements for San Joaquin kit fox (ICF International 2012). In the City of Bakersfield, Kern County, San Joaquin kit foxes occur in highly urbanized environments including near highways; therefore, areas within SCVHP modeled San Joaquin kit fox habitat near highways should similarly have to mitigate. Construction activities within 656 feet of highways would also push the edge effects further out into more suitable San Joaquin kit fox habitat thereby degrading kit fox habitat further away from the highway.
p. 2-113	Section 2.7.3.1 Non-Native Species and Disease: Effects on Focal Species and Habitats	Should mention here how non-native red foxes compete with and displace San Joaquin kit foxes (Lewis *et al*. 1993, USFWS 2010).

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
	Figure 2-5 Santa Clara RCIS Protected Areas	The protected areas map should be updated to include the Sparling Ranch Conservation Bank in southeastern Santa Clara/northeastern San Benito counties, the SCVHP's reserves (e.g., Coyote Ridge Open Space Preserve, Pacheco Creek Preserve), and other mitigation lands (e.g., mitigation lands for or managed by the Santa Clara Valley Water District, Santa Clara Valley Transportation Authority, Kirby Landfill, Land Trust of Santa Clara Valley, and the low-effect habitat conservation plans mentioned in the Santa Clara RCIS document, etc.).
	Figure 2-6 Mitigation and Conservation Bank Service Areas with Available Credits Overlapping the RCIS Area.	The Pleasanton Ridge Conservation Bank has been suspended, and therefore, should not be included as a conservation bank having credits available.

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p. 3-19	California Tiger Salamander, Conservation Action CTS-1 Acquire Breeding and Upland Habitat	The Santa Clara RCIS occurs within the Bay Area recovery unit for the California tiger salamander (note: the Bay Area recovery unit also includes areas outside of the Santa Clara RCIS including central and southern Alameda County, western Stanislaus County, western Merced County, and the majority of San Benito County) (USFWS 2017). The downlisting criteria for the California tiger salamander in the *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (Ambystoma californiense)* (CTS Recovery Plan) (USFWS 2017) include the preservation and management of preserves a minimum size of 3,398 acres containing at least four breeding ponds with no evidence of hybrid genes for at least 26 years (approximately two Central California tiger salamander lifespans), and no known hybrids within dispersal distance (1.3 miles) of the preserves. The Bay Area recovery unit contains six management units which overlap with the Santa Clara RCIS. The recommended number of preserves within each management unit is: North Diablo Range (5), Northeast Diablo Range (5), Northwest Diablo Range (5), East Santa Cruz Mountains (4), Southwest Diablo Range (5), and Southeast Diablo Range (5). Thus the CTS Recovery Plan recommends the protection of a total of 29 preserves (minimum size of 3,398 acres with at least four breeding ponds) for a total of 98,542 acres within the Bay Area recovery unit. Therefore, the Santa Clara RCIS should be consistent with the CTS Recovery Plan by targeting the protection of preserves (minimum size of 3,398 acres containing at least four breeding ponds) distributed among the six management units within the Santa Clara RCIS as recommended in the CTS Recovery Plan in areas that are not dominated by hybrid or non-native tiger salamanders (USFWS 2017).
p. 3-20	California Tiger Salamander, Objective 2-5 Managing Hybrids	Should reference the California Tiger Salamander Science Advisory Committee's April 12, 2017, "White Paper on Hybridization and Recovery" (California Tiger Salamander Science Advisory 2017).

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
p. 3-20	California Tiger Salamander, Conservation Action CTS-10. “Plant native emergent vegetation around the perimeter of ponds and wetlands.”	Planting too much native emergent vegetation within and around the perimeter of ponds may reduce the suitability of the pond for California tiger salamander breeding and dispersal unless the pond is appropriately grazed. Need to reword so that the action will not result in too much native emergent veg.
p. 3-20	California Tiger Salamander, Conservation Action CTS-14: “Manage targeted ponds to have short ponding durations. Short ponding durations (e.g., approximately 3 months) favor reproductive success for native California tiger salamanders, whereas perennial ponds favor hybrid salamanders and other nonnative predators.”	Should recognize that reducing the hydroperiods of ponds that could also potentially support breeding California red-legged frogs (e.g., ponds that stay wet through August) could adversely affect California red-legged frogs and thus may require conservation measures and additional mitigation for effects to breeding California red-legged frogs. Managing ponds to dry out in September – October would discourage bullfrogs, fish, and non-native tiger salamanders while still allowing successful California red-legged frog breeding. Rework Conservation Action to reflect this.

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
p. 3-21 and 3-25	Laguna Seca and Coyote Valley	The Santa Clara RCIS includes the preservation of Laguna Seca and Coyote Valley as a conservation priority for the California tiger salamander (p. 3-21) and California red-legged frog (p. 3-25). While USFWS agrees with the important benefits of the preservation of Laguna Seca and Coyote Valley as an important dispersal corridor for mammals and other sensitive wildlife species between the Diablo Range and the Santa Cruz Mountains (and the importance of the preservation of the adjacent Tulare Hill to the Bay checkerspot butterfly and rare serpentine plant species), USFWS believes that Laguna Seca should not be considered a priority for mitigation for effects to the California tiger salamander and California red-legged frog. Although known occurrences and critical habitat for the California tiger salamander are located in the foothills to the east and west of Laguna Seca at Calero County Park (to the west) and the Coyote Ridge Open Space Preserve (to the east), California tiger salamanders have not been observed on the valley floor near Laguna Seca in a long time. California red-legged frogs are known to occur in the foothills to the east of Laguna Seca at Calero County Park (in low numbers) and in critical habitat at the Coyote Ridge Open Space Preserve (to the east); however, California red-legged frogs have not been observed on the valley floor near Laguna Seca in a long time. Laguna Seca and Coyote Valley are also unlikely to be a significant dispersal corridor for the California tiger salamander and California red-legged frog between the Diablo Range and the Santa Cruz Mountains because of many significant barriers to their dispersal (e.g., highways, roads, predators, developed areas, and other unsuitable habitat). Although suitable breeding habitat for California tiger salamanders and California red-legged frogs could potentially be created at Laguna Seca, the ability of the breeding habitat to contribute to the recovery of these listed amphibians is likely to be low due to a high number of invasive species (e.g., bullfrogs) and other predators in the area, the lack of a sufficient amount of high quality contiguous upland refugia habitat, and the many threats to any California tiger salamanders and California red-legged frogs dispersing to and from Laguna Seca (e.g., road mortalities); therefore, Laguna Seca could become a population sink for these listed amphibians. Henry W. Coe State Park: Is Henry W. Coe State Park counted in the acres of "protected habitat" for California red-legged frog and California tiger salamander? Although most areas within Henry W. Coe State Park are "protected" from development, the stock ponds essential to California red-legged frog and California tiger salamander breeding are not protected in that

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
p. 3-21 and 3-25 (cont'd)	Laguna Seca and Coyote Valley (cont'd)	mortalities); therefore, Laguna Seca could become a population sink for these listed amphibians. Henry W. Coe State Park: Is Henry W. Coe State Park counted in the acres of "protected habitat" for California red-legged frog and California tiger salamander? Although most areas within Henry W. Coe State Park are "protected" from development, the stock ponds essential to California red-legged frog and California tiger salamander breeding are not protected in that the California Department of Parks and Recreation is not taking measures to ensure that these stock ponds will continue to function in perpetuity. Many of these stock ponds are in danger of failing, and USFWS is not aware at this time of any plans to ensure these stock ponds do not fail based on California Department of Parks and Recreation's mission for preserving more "natural habitat" instead of stock ponds that support breeding California red-legged frogs and California tiger salamanders. Grazing also is prohibited at Henry W. Coe State Park which reduces the suitability of the uplands for California tiger salamanders refugia and dispersal. The Santa Clara RCIS recommends the preservation and management of southern Henry W. Coe State Park, which contains breeding ponds in critical habitat for the California tiger salamander (p. 3-21); therefore, the Santa Clara RCIS should encourage the California Department of Parks and Recreation to allow grazing at Henry W. Coe State Park for the benefit of the California tiger salamander and the implementation of a plan to protect and manage all of the stock ponds that support breeding California tiger salamanders and California red-legged frogs that are in danger of failing.

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
p.3-24	California Red-legged Frog, Conservation Action CLRF-6: "Remove exotic species such as bullfrogs, mosquitofish, other nonnative predatory fish, and nonnative turtles from breeding ponds and stream segments."	Managing ponds to dry out in September – October would discourage bullfrogs, fish, and non-native tiger salamanders while still allowing California red-legged frog breeding. Add wording that says that pond management strategy would discourage exotics.

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
p. 3-35	San Joaquin Kit Fox Conservation Goals and Objectives	Should include the control of non-native red foxes as a conservation priority since they are one of the primary competitors of the San Joaquin kit fox and displace the San Joaquin kit fox from their dens. Red foxes are known to occur in San Joaquin kit fox habitat in western Merced County and have displaced San Joaquin kit foxes from the Camp Roberts area in Monterey and San Luis Obispo counties (USFWS 2010). As early as 1993, red fox appeared to be displacing San Joaquin kit fox in the northwestern part of the kit fox range (Lewis *et al*. 1993 cited in USFWS 2010). According to the five-year review for the San Joaquin kit fox, "Since listing, kit fox have been increasingly threatened by introduced red fox, which have expanded their range southward from the San Francisco Bay Area. High coyote densities also threaten kit fox where they apparently exclude them from what appears to be otherwise suitable open and protected lands" (p. 70, USFWS 2010). Red foxes particularly have a competitive advantage over San Joaquin kit fox in the wetter areas of the Santa Clara RCIS where permanent water sources are available compared to the more arid San Joaquin Valley. With climate change it is possible that more arid and warmer conditions could increase habitat suitability within some portions of the Santa Clara RCIS for the San Joaquin kit fox giving them a slight competitive advantage over red foxes in areas that lack permanent water sources. The conservation strategy and mitigation opportunities for the San Joaquin kit fox should be more flexible to allow some conservation actions for the San Joaquin kit fox to be directed to higher priority recovery areas outside of the Santa Clara RCIS identified in Figures 1A-C in the five-year review for the San Joaquin kit fox (USFWS 2010) including core populations in the Ciervo-Panoche area of eastern San Benito County and satellite populations and linkage areas in western Merced and Stanislaus counties. The five-year review recommends, "Focus land acquisitions on the establishment of large blocks of land (at least 10,000 acres in size) on the San Joaquin Valley floor and western fringes. Such large parcels are critical to supporting sustainable populations of kit fox for long-term conservation, and should be linked with protected broad dispersal corridors. These acquisitions are most likely to aid kit fox recovery if they build on existing protected lands to achieve larger expanses of protected land, if acquired lands possess the vegetative structure and native prey base that are associated with thriving kit fox populations, and if acquired lands are not isolated from extant populations of either the kit fox or its prey species. Large holdings of native habitat are also expected to be less suitable for coyotes and red fox that are responsible for high levels of kit fox mortality" (pp. 71-72,

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
p. 3-35	San Joaquin Kit Fox Conservation Goals and Objectives	dispersal corridors. These acquisitions are most likely to aid kit fox recovery if they build on existing protected lands to achieve larger expanses of protected land, if acquired lands possess the vegetative structure and native prey base that are associated with thriving kit fox populations, and if acquired lands are not isolated from extant populations of either the kit fox or its prey species. Large holdings of native habitat are also expected to be less suitable for coyotes and red fox that are responsible for high levels of kit fox mortality" (pp. 71-72, USFWS 2010).
p. 3-47	Loma Prieta Hoita Conservation Strategy, Conservation Action LPH-4 "Maintain and enhance the hydrological systems (e.g., streams, springs, ponds) which support or have the potential to support Mount Hamilton thistle in the RCIS area"	Should this say Loma Prieta hoita instead of Mount Hamilton thistle?
p. 3-57	Serpentine Soils Conservation Goals and Objectives	Should work with the SCVHP to implement a nitrogen deposition fee program (that compliments the SCVHP's nitrogen deposition fee program for SCVHP-covered projects) that encourages projects throughout the Santa Clara RCIS area to mitigate for the effects of increased nitrogen deposition on serpentine habitats (e.g., increase in vehicle traffic, power plants, etc.) by funding grazing and invasive plant species control on SCVHP and Santa Clara RCIS preserves with serpentine habitats.
p. 3-67	Approved Recovery Plans	Should include the *Recovery Plan for Upland Species of the San Joaquin Valley, California* which covers the San Joaquin kit fox (USFWS 1998)
Section 3.9.2.2	Management and Monitoring Planning Phase	This section discusses the requirements for site specific management planning, but does not include analysis of funding required to implement the plan. This funding analysis is required by the Service for conservation banks and permittee responsible mitigation.

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Section 3.9.2.3, pg. 3-78 – 3-79	"Long-term monitoring is implemented after the baseline inventory phase is complete and any near-term restoration or enhancement actions have been largely completed."	The "interim management period" is missing; during this period the baseline conditions are determined, any ecological performance monitoring is conducted, and the long-term funding gains interest and earnings without being expended. Monitoring is more intensive and frequent during this period than it is under long-term management, and there may be different or additional management actions required that are not required during the long-term. The long-term management period does not begin until all ecological performance standards are met and the long-term funding has been fully funded for at least 3 years. If ecological performance standards have not been met, and remedial action is required, then the long-term management period would not start until remedial action is completed, along with any additional monitoring.
Section 3.9.2.2, pg. 3-79	"The long-term monitoring phase includes…..Monitor species response to any enhancement, restoration or habitat creation described in the MCA…..Monitor restoration sites for success; remediate sites if initial success criteria are not being met…"	See comment above.
Section 3.9.4.1, pg. 3-80	"Routine monitoring (also known as easement monitoring) tracks the status of (sic) mitigation site and documents that the requirements of the conservation easement or other management agreements, including the MCA, are being met. Routine monitoring verifies that the MCA holder and landowner (if these are different parties) are carrying out the terms of the MCA and the easement.	The type of easement is not identified, but we are assuming that "conservation easement" is what is meant here. The Service does not consider "routine monitoring" to be the same as conservation easement monitoring. Conservation easement monitoring is limited to the terms of the conservation easement, which is intended to protect the conservation values of the site. The conservation easement holder is a third party, and is not the mitigation sponsor, nor the property owner. Other types of monitoring on the site could be performance monitoring, biological monitoring, etc.

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Section 3.9.4.2, pg. 3-80	"Specific detail regarding what needs to be included in the monitoring plan for a mitigation credit agreement can be found in the Program Guidelines for MCAs (California Department of Fish and Wildlife 2017)."	We could not locate this document, so we could not evaluate whether or not this requirement is consistent with Service policy, standards, or practices.
Section 3.9.4.2, pg. 3-81	"Monitoring the function and health of certain habitat types can allow for conclusions about several species at one time, without surveying for each species. This includes how species respond to restoration or enhancement actions on mitigation lands."	This is a very general statement that should not be applied unilaterally. The use of a surrogate to draw conclusions about a target species, whether the surrogate is habitat or another more common species, should be evaluated on a case by case basis.
Section 4.3, pg. 4-5	An MCA identifies the type and number of credits a person or entity proposes to create…as well as the terms and conditions under which those credits may be used…Typically, credits are used to meet compensatory mitigation obligations for impacts on aquatic resources or special-status species…MCAs must be prepared according to the requirements of CFGC 1856."	In general, any compensatory mitigation project proposed to compensate for unavoidable adverse impacts to species listed under the Endangered Species Act (ESA), would need to be consistent with the Service's policies, standards, and practices. Any mitigation project that would result in "credits" that could be used to offset the impacts of multiple projects, is considered a conservation bank, and would need to follow current conservation banking standards and practices.
Section 4.3, pg. 4-5	"The MCA applicant can set aside or purchase lands, when doing so is most cost effective, knowing those lands will provide useful mitigation values in the future."	It is not recommended that anyone wishing to establish a mitigation site purchase property before that property has been vetted through the appropriate regulatory agencies due diligence process. The Service has the discretion to reject a site that fails to meet its standard of sustainability and durability.

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Section 4.3, pg. 4-5	"An MCA gives CDFW and other resources agencies some assurance that proposed mitigation fits within a larger conservation framework (the RCIS) and that investments in resource protection, restoration, and enhancement collectively contribute to meeting regional conservation goals and objectives."	The Service would need to evaluate the MCA to determine if it is consistent with existing policies, standards, and practices.
Section 4.3, pg. 4-6	"An MCA can also be used to meet the requirements of federal environmental laws and regulations with the approval of applicable federal regulatory agencies."	An MCA that describes mitigation credits would need to use the existing bank enabling instrument (BEI) template or duplicate the information required in the BEI template to comply with Service requirements.
Section 4.3.1, pg. 4-6	"MCAs identify the types and amounts of mitigation credits that will be created through implementation of conservation actions and habitat enhancement actions, and provide a schedule for their release based on relevant milestones in project implementation (e.g., land protection, restoration goal achievement)."	The existing and recently updated BEI template already achieves this. It was developed by eight federal and state agencies along with input from interested stakeholders, for use in the State of California. Using the existing BEI template as an MCA may lead to expedited approvals from multiple agencies.

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Section 4.3.1, pg. 4-6	"Typically, mitigation credits will be established for the following types of conservation actions and habitat enhancement actions. Permanent acquisition of land development rights (purchase in fee title, purchase, and/or placement of a conservation easement, establishment of a deed restriction)."	In general, a conservation easement is the only one of these things that is consistent with Service policy, standards, and practices, for mitigation that is to provide a permanent offset for unavoidable impacts to federally listed species. The list does not include funding perpetual management of a site; what is the source of this funding, and is that not a requirement?
Appendix B, pg. B-12	"For example, USFWS could determine that the MCA meets regulations and polices for conservation banks and could approve the MCA as a programmatic (umbrella) conservation bank enabling instrument."	If the existing BEI template were used in place of an MCA, the Service could determine that it meets policies for conservation banks.

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		Santa Clara Valley Dudleya: Santa Clara Valley dudleya is a federally listed endangered plant species that is endemic to the Santa Clara RCIS area; all known occurrences are in Santa Clara County. The Santa Clara Valley dudleya is not State-listed. The Santa Clara RCIS states in Appendix E, p. E-41 that there are 55 occurrences of the Santa Clara Valley dudleya. However, according to the SCVHP (ICF International 2012) and the five-year review for the Santa Clara Valley dudleya (USFWS 2013), there were 209 known occurrences of Santa Clara Valley dudleya when the SCVHP was issued in 2013; 207 of those occurrences are within the permit area for the SCVHP. The SCVHP allows impacts to between 11 and 14 occurrences of Santa Clara Valley dudleya depending on the number of new occurrences found (ICF International 2012). The SCVHP is required to preserve between 55 and 67 occurrences of Santa Clara Valley dudleya depending on the number of new occurrences found. According to the SCVHP: Regardless of the level of impact, the Implementing Entity will acquire (through acquisition or conservation easement) lands that support 55 extant occurrences of Santa Clara Valley dudleya throughout its entire range in the permit area (LAND-P2). In accordance with the Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area (U.S. Fish and Wildlife Service 1998c), occurrences will be distributed throughout the range of the species (north, central, and south). The Implementing Entity will stratify protection and acquire sites in the study area on both sides of Coyote Valley to ensure geographic diversity in protected occurrences. The majority of the known occurrences will be acquired, enhanced through improved management, and monitored along Coyote Ridge in Coyote-4, 5, and 6. The number of occurrences in parentheses after each location name will also be acquired: Santa Teresa Hills and Tulare Hill (4), west of Calero County Park (2), and north of Morgan Hill (1). Incorporation of portions of Santa Teresa, Calero, Anderson Lake and Almaden Quicksilver County parks into the Reserve System (Table 5-5) will protect 11 of the 55 occurrences and provide opportunities for improved management and monitoring. This will bring total protection of this species to 57 occurrences in Type 1 open space (p. 5-184 in ICF International 2012).

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Appendix E (cont’d)	Evaluation of Species for Inclusion as Focal Species: Santa Clara Valley dudleya (cont’d)	(Table 5-5) will protect 11 of the 55 occurrences and provide opportunities for improved management and monitoring. This will bring total protection of this species to 57 occurrences in Type 1 open space (p. 5-184 in ICF International 2012). The SCVHP has already achieved its required conservation goal for the number of Santa Clara Valley dudleya occurrences it is required to preserve (67) through the preservation of 99 occurrences (occurrences defined as occupied rock outcrops) within the 1,800-acre Coyote Ridge Open Space Preserve on the eastern side of the Santa Clara Valley. However, as stated previously the SCVHP is required to protect occurrences of Santa Clara Valley dudleya on both sides of Coyote Valley to ensure geographic diversity in protected occurrences. There are an additional 11 known occurrences of Santa Clara Valley dudleya are on Santa Clara County Parks land within the SCVHP area that are likely to be preserved in the future when Santa Clara County Parks lands are enrolled in the SCVHP reserve system (ICF International 2012). Therefore, the SCVHP is likely to preserve a total of at least at 110 occurrences (53 percent of all known occurrences) of the Santa Clara Valley dudleya rangewide. The SCVHP will also likely protect additional occurrences of the Santa Clara Valley dudleya in order to meet the criteria for preservation of serpentine habitats and other co-occurring SCVHP covered serpentine species (e.g., bay checkerspot butterfly and rare serpentine plant species). However, many occurrences of Santa Clara Valley dudleya within the Santa Clara RCIS may remain unprotected. Federally listed plant species have limited protections under the Endangered Species Act if there is no Federal agency involved (i.e., a Federal nexus through Federal funding, a Federal permit, or Federal land). Since the Santa Clara Valley dudleya is restricted to serpentine rock outcrops, it is unlikely that a Federal nexus would be triggered with the U.S. Army Corps of Engineers for a 404 permit under the Clean Water Act that would address adverse effects to the Santa Clara Valley dudleya. The Santa Clara Valley dudleya also does not occur on any Federal lands. Therefore, the only Federal nexus that could be triggered that would cover the Santa Clara Valley dudleya is if a project were to adversely affect any co-occurring federally listed animal species (e.g., Bay checkerspot butterfly, California tiger salamander, or California red-legged frog) resulting in the need for a project to get an

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
Appendix E	Evaluation of Species for Inclusion as Focal Species: Santa Clara Valley dudleya (cont'd)	adverse effects to the Santa Clara Valley dudleya. The Santa Clara Valley dudleya also does not occur on any Federal lands. Therefore, the only Federal nexus that could be triggered that would cover the Santa Clara Valley dudleya is if a project were to adversely affect any co-occurring federally listed animal species (e.g., Bay checkerspot butterfly, California tiger salamander, or California red-legged frog) resulting in the need for a project to get an incidental take permit from USFWS under Section 10 of the Endangered Species Act (i.e., a habitat conservation plan such as the SCVHP). Therefore, the Santa Clara Valley dudleya has no protections under the Endangered Species Act from projects that would not result in "take" of a federally listed animal. The Santa Clara Valley dudleya is not State-listed, and therefore has no protections under the California Endangered Species Act. Therefore, any Santa Clara Valley dudleya plants that are not protected within the SCVHP's reserve system have limited protections. The Santa Clara Valley dudleya is endemic to the Santa Clara RCIS area (all known occurrences are restricted to the Santa Clara RCIS area). Therefore, the Santa Clara RCIS could play a significant role in the protection of this federally listed endangered plant species in areas that are not protected within the SCVHP's reserve system. Therefore, if the Santa Clara Valley dudleya is not included as a focal species, the Santa Clara RCIS should target the acquisition of serpentine habitats for Santa Clara RCIS focal plant species in areas that also support Santa Clara Valley dudleya while not directly competing with the SCVHP for preservation of serpentine habitats.

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
Appendix E (cont'd)	Evaluation of Species for Inclusion as Focal Species: Bay checkerspot Butterfly	The Bay checkerspot butterfly is a federally listed threatened species (USFWS recommended uplisting to endangered in the last five year review (USFWS 2009)) with all known extant occurrences located within the SCVHP permit area in Santa Clara County except for two populations recently reintroduced to Edgewood Park and San Bruno Mountain in San Mateo County. Therefore, the portions of the Santa Clara RCIS area that overlap with the SCVHP permit area are critical to the recovery of the Bay checkerspot butterfly. The vast majority of projects that would directly impact Bay checkerspot butterfly habitat within the Santa Clara RCIS would be covered by and mitigate through the SCVHP (or the Pacific Gas and Electric Company (PG&E) Bay Area Operations and Maintenance Habitat Conservation Plan for PG&E projects). One major exception is the High Speed Rail Project which will be covered under a Section 7 consultation with USFWS. However, there are many projects within the Santa Clara RCIS area that are not covered by the SCVHP that will indirectly impact Bay checkerspot butterfly habitat through nitrogen deposition from vehicle exhaust, power plants, etc. (see the discussion of nitrogen deposition below and the need for projects within the Santa Clara RCIS area not covered by the SCVHP to mitigate by funding a nitrogen deposition fee to assist the SCVHP in management of invasive plant species in Bay checkerspot butterfly habitat). The SCVHP authorizes the permanent loss of 300 acres (3 percent) and the temporary disturbance of 54 acres (1 percent) of the 8,621 acres of modeled primary habitat for the Bay checkerspot butterfly within the SCVHP permit area (ICF International 2012). The PG&E Bay Area Operations and Maintenance Habitat Conservation Plan authorizes the disturbance of 66 acres of Bay checkerspot butterfly habitat within Santa Clara County and San Mateo County while requiring the preservation/restoration of 74 acres of Bay checkerspot butterfly in Santa Clara County or San Mateo County (ICF 2017). The SCVHP is required to preserve 6,721 acres (78 percent) of the Bay checkerspot butterfly habitat within the SCVHP permit area within its reserve system (of which 5,890 acres (68 percent) must be in Type 1 Open Space). The Santa Clara RCIS has conservation goals of 90 percent for rare serpentine focal plant species and serpentine habitats compared to only 78 percent for the Bay checkerspot butterfly in the SCVHP. If the Bay checkerspot butterfly were included as a focal species in the Santa Clara RCIS with a 90 percent conservation goal (consistent with other rare serpentine species), this would result in the

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
Appendix E (cont'd)	Bay checkerspot butterfly (cont'd)	The Santa Clara RCIS has conservation goals of 90 percent for rare serpentine focal plant species and serpentine habitats compared to only 78 percent for the Bay checkerspot butterfly in the SCVHP. If the Bay checkerspot butterfly were included as a focal species in the Santa Clara RCIS with a 90 percent conservation goal (consistent with other rare serpentine species), this would result in the protection of an additional 1,038 acres of Bay checkerspot butterfly habitat above the requirements of the SCVHP. However, there would be the potential for direct competition with the SCVHP for limited amounts of available Bay checkerspot butterfly mitigation lands if the Bay checkerspot butterfly were included as a focal species under the Santa Clara RCIS. In lieu of including the Bay checkerspot butterfly as a focal species, USFWS recommends that the Santa Clara RCIS should work cooperatively with the SCVHP and target the acquisition of serpentine grassland habitat for Santa Clara RCIS focal plant species in areas that also support the Bay checkerspot butterfly. The Santa Clara RCIS, however, should not directly compete with the SCVHP for mitigation lands that SCVHP needs for meeting the SCVHP's Bay checkerspot butterfly and serpentine grassland habitat acquisition requirements. The Santa Clara RCIS could offer to jointly purchase with the SCVHP lands containing Bay checkerspot butterfly and serpentine grassland habitat while carving out parcels specifically for the SCVHP to meet both program's mitigation needs.
Appendix E (cont'd)	Other Rare Plants not Included in Santa Clara RCIS	The San Joaquin spearscale, Hoover's button celery, and prostrate navarretia are alkaline grassland/wetland plant species that occur in the Soap Lake area but are not included as focal species in the Santa Clara RCIS. According to the Santa Clara Valley Water District, there are mitigation needs for impacts to these rare plant species, and/or these plant species would benefit from inclusion as focal species under the Santa Clara RCIS.

Location in Document	Subject, Title or Statement	Information Gaps/Comments/Suggested Edits
Appendix G	Table G-2 Habitat Distribution Model Comparison: Wildlife	Why does the habitat model for foothill yellow legged frog breeding and foraging habitat in the RCIS differ from that in the SCVHP? For example, the SCVHP considers suitable foothill yellow legged frog habitat as "low gradient streams (0 to 4% slope) or rivers not regulated by a dam," but the RCIS considers all streams with a 0-11% slope and does not consider whether they are regulated by dams. USFWS believes that consistent with the SCVHP that areas regulated by dams should not be considered as suitable mitigation for the foothill yellow-legged frog; therefore, conservation for the foothill yellow-legged frog should target streams that are not regulated by dams.

Nitrogen Deposition: SCVHP covered projects mitigate for the effects of nitrogen deposition from vehicle exhaust, etc. on rare serpentine grassland species (e.g., Bay checkerspot butterfly and rare serpentine endemic plant species) by paying a nitrogen deposition fee which funds the management of invasive plant species (e.g., grazing) within serpentine grasslands within the SCVHP reserve system. However, nitrogen deposition also comes from projects not covered by the SCVHP both inside and outside the SCVHP permit area. The nitrogen deposition funds the SCVHP receives from SCVHP-covered projects are not sufficient to minimize the effects of nitrogen deposition from Santa Clara RCIS projects not covered by the SCVHP. Therefore, any Santa Clara RCIS projects that would contribute to increased nitrogen deposition should similarly mitigate by funding the management of invasive plant species (e.g., grazing) within serpentine grasslands for rare serpentine endemic species on SCVHP reserve lands as well as other lands with rare serpentine endemic species in the Santa Clara RCIS. This could be achieved by Santa Clara RCIS projects that result in increased nitrogen deposition paying the nitrogen deposition fee to the SCVHP.

The Santa Clara Valley Habitat Agency provided the following comments to the City of Mountain View on nitrogen deposition impacts from the North Bayshore Precise Plan and the need for development projects outside of the SCVHP permit area to mitigate for the effects of nitrogen deposition on the Bay checkerspot butterfly and rare serpentine plant species in the Santa Clara Valley (E. Sullivan, Santa Clara Valley Habitat Agency, *in litt*. 2014):

> The Santa Clara Valley Habitat Agency (Habitat Agency) agrees with the statement that the Santa Clara Valley Habitat Plan (Plan) funding strategy provides for the full and successful implementation of the Plan related to sensitive serpentine habitat and the Bay checkerspot butterfly and does not rely on contributions from cities outside of the Plan area, but the argument is a non sequitur relative to the City's responsibilities as a CEQA Lead Agency. While the Plan both mitigates for impacts from covered activities within the Plan area over the Plan term and also provides additional conservation to meet the NCCP standard of recovery. It is incorrect, however, to make the leap that the Plan strategy alone is sufficient to completely restore local serpentine communities or to offset any conceivable future nitrogen deposition impacts.
>
> Although the Plan provides a recovery strategy for serpentine habitats and the plant and animal species that depend on them, the strategy is not entirely self-contained. The primary reason for this is that the Plan is necessarily limited to mitigating for impacts from Plan-covered activities, while the impacts come from projects distributed over a much broader area and over a much greater period. Studies reveal that a significant portion of N-deposition affecting covered species within the Plan area can be traced to sources outside the Plan area. The amount that various sources contribute to deposition was assessed with different modeling approaches. The most complete of these methods was the use of the Particle Precursor Tagging Methodologies (PPTM) tagging approach in Community Multi-scale Air Quality Model (CMAQ). In the base year, the CMAQ PPTM simulation attributes 30% of the total nitrogen deposition to mobile sources within the study area. Another 16% of the nitrogen deposition comes from stationary sources in the study area.

Therefore, only 46% of nitrogen deposition on the habitat areas comes from existing development and vehicle traffic generated locally within the study area. The areas of Santa Clara County not covered by the Plan contribute 17% of the nitrogen deposition while 11% of the deposition comes from other Bay Area counties. The CMAQ simulation indicates that the remaining 26% of the N-deposition comes from anthropogenic emissions in the remainder of the modeling domain (i.e., most of the remainder of California other than Bay Area counties and a portion of Nevada), initial and boundary concentrations (i.e., effects from outside of the modeling domain), and biogenic emissions within the Bay Area counties" (Habitat Plan, p. 4-71).

A complete conservation strategy would rely upon project specific mitigation contributions from cities outside the Plan area as those projects do create additional impacts which are not covered by the Plan conservation strategy. This is because additional nitrogen deposition, over and above that covered by the Plan, will likewise result in even more invasive weed encroachment on serpentine habitats. In other words, the Plan assumes a set amount of weed encroachment based on Plan covered activities and provides mitigation and recovery for that, but there will always be additional weed encroachment impacts to be mitigated as long as there are nitrogen emitting sources outside of those covered by the Plan. Those impacts should be considered, analyzed and mitigated as part of the CEQA review from any Lead Agency proposing a project that results in increased nitrogen emissions.

Therefore, the Santa Clara RCIS should include a strategy for projects not covered by the SCVHP to mitigate for the effects of nitrogen deposition on the Bay checkerspot butterfly and rare serpentine plant species by paying a nitrogen deposition fee that funds the management of invasive plant species (e.g., grazing) within serpentine habitats on SCVHP and Santa Clara RCIS reserve lands that contain Bay checkerspot butterflies and rare serpentine plant species.

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Sullivan, Edmund. 2014. Comment letter from Executive Officer, Santa Clara Valley Habitat Agency, Morgan Hill, California to Martin Alkire, Principal Planner, Planning Division, City of Mountain View, Mountain View, California, dated October 21, 2014. Subject: Nitrogen Deposition Impacts from North Bayshore Precise Plan.

9. U.S. Fish and Wildlife Service, April 11, 2018

Summary of Comment 9-1

The U.S. Fish and Wildlife Service (Service) comments that this RCIS makes assumptions that CDFW's RCIS Program and the use of this RCIS to enable MCAs is interchangeable with existing standards and practices with regard to compensatory mitigation under the Federal Endangered Species Act (ESA). The Service states that the information in this RCIS is not consistent with current standards and practices developed by the Service; nor is it consistent with current statewide practices developed under the Memorandum of Understanding Concerning Mitigation and Conservation Banking and In-lieu Fee Programs in the State of California.

Response to Comment 9-1

The Santa Clara County RCIS was developed to be consistent with the June 2017 Program Guidelines (California Department of Fish and Game 2017). The Program Guidelines includes required elements in an RCIS to enable credits to be created through an MCA to fulfill compensatory mitigation requirements established under any state or federal environmental law, as determined by the applicable local, state, or federal regulatory agency, including under the California Endangered Species Act, CDFW's Lake and Streambed Alteration program, or the California Environmental Quality Act.[7]

It is important to the Santa Clara County RCIS Steering Committee that credits created through an MCA can be used to provide compensatory mitigation for Federal ESA compliance, as well as for other state and federal environmental laws and regulations. The Steering Committee anticipates that the forthcoming MCA Guidelines and templates will facilitate compatibility with Service requirements, policies, standards, and practices.

Summary of Comment 9-2

This comment provides an overview of the comments provided by the Service. The Service states that comments pertaining to mitigation in the table are intended to address the gaps between what is presented in the RCIS and current standards and practices used by the Service

Response to Comment 9-2

Please see below for responses to specific comments. Responses to comments pertaining to mitigation address how this RCIS provides flexibility to use this RCIS to inform compensatory mitigation under the Federal ESA.

Summary of Comment 9-3

This comment recommends referencing the Recovery Plan for Upland Species of the San Joaquin Valley, California which covers the San Joaquin kit fox.

[7] CFGC 1856(c)(1-3)

Response to Comment 9-3

The Recovery Plan for Upland Species of the San Joaquin Valley, California was added to Table 1-4. Section 3.8.2.7, *Recovery Plan for Upland Species of the San Joaquin Valley, California*, describes how this RCIS is generally consistent with the Recovery Plan. A conservation priority was revised based on information in the five-year review for the San Joaquin kit fox and a citation of the five-year review was added (Section 3.6.8.2, *Conservation Priorities*, for San Joaquin kit fox).

Summary of Comment 9-4

This comment clarifies the status of the Pleasanton Ridge Conservation Bank and the Sparling Ranch Conservation Bank.

Response to Comment 9-4

The following was added to the description of the Pleasanton Ridge Conservation Bank, as recommended by comment 9-4: "The bank is currently suspended as of August 8, 2018 and cannot provide credits." The description of the Sparling Ranch Conservation Bank in Section 2.2.1.3, *Conservation and Mitigation Banks* was revised to state that the Bank offers credits for California tiger salamander and California red-legged frog.

Summary of Comment 9-5

This comment questions the exclusion of all areas within 656 feet of highways from the San Joaquin kit fox habitat model. The Service states that the model is not consistent with the San Joaquin kit fox model used by the habitat plan.

Response to Comment 9-5

The exclusion of areas within 656 feet of highways was intended to represent the low likelihood of use of areas close to highways. This exclusion area was removed from the San Joaquin kit fox model in response to this comment, however, to reflect the potential occurrence of San Joaquin kit fox in these areas and to be consistent with the San Joaquin kit fox model used by the Santa Clara Valley Habitat Plan. The RCIS does not intend to identify areas where a project should (or shouldn't) be responsible for providing mitigation for impacts to San Joaquin kit fox, or any other focal species or conservation element.

Summary of Comment 9-6

This comment recommends mentioning in Section 2.4.4.3, *Non-native Species and Disease*, *Effects on Focal Species and Habitats*, how non-native red foxes compete with and displace San Joaquin kit foxes.

Response to Comment 9-6

The following was added to Section 2.4.4.3, *Effects on Focal Species and Habitats*: “Non-native red foxes compete with and displace San Joaquin kit foxes (Lewis et al. 1993, U.S. Fish and Wildlife Service 2010b).”

Summary of Comment 9-7

This comment recommends updating Figure 2-5 to include Sparling Ranch Conservation Bank and other mitigation lands.

Response to Comment 9-7

The protected areas map was updated to include the Sparling Ranch Conservation Bank and the Santa Clara Valley Habitat Plan's reserves. The mitigation lands identified in comment 9-7 were included in Figure 2-5 if they were included in the California Protected Areas Database (California Protected Areas Database 2016) or the California Conservation Easement Database (California Conservation Easement Database 2015).

Summary of Comment 9-8

This comment states that the Pleasanton Ridge Conservation Bank has been suspended, and therefore, should not be included as a conservation bank having credits available.

Response to Comment 9-8

The Pleasanton Ridge Conservation Bank was removed from Figure 2-6 and Section 2.2.1.3, *Conservation and Mitigation Banks*.

Summary of Comment 9-9

This comment recommends revising the conservation objective for protection of California tiger salamander habitat to be consistent with the Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*) (U.S. Fish and Wildlife Service 2017).

Response to Comment 9-9

Objective 2-1 (Section 3.6.2.1, *Conservation Goals and Objectives*) and the first conservation priority listed in Section 3.6.2.2, *Conservation Priorities*, were revised to incorporate the Recovery Plan's preserve targets for the management units overlapping the RCIS area.

Summary of Comment 9-10

This comment recommends referencing the California Tiger Salamander Science Advisory Committee's April 12, 2017, "White Paper on Hybridization and Recovery" (California Tiger Salamander Science Advisory 2017).

Response to Comment 9-10

Guidance provided by the "White Paper on Hybridization and Recovery" (California Tiger Salamander Science Advisory 2017) on managing hybrid tiger salamanders was incorporated into Conservation Action CTS-13, and the white paper was cited in Chapter 5, *References*.

Summary of Comment 9-11

This comment recommends rewording California tiger salamander Conservation Action CTS-10 so that the action will not result in too much native emergent vegetation.

Response to Comment 9-11

Conservation Action CTS-10 was reworded to emphasize that ponds should be managed to prevent overgrowth of vegetation, as follows: "Plant native emergent vegetation around the perimeter of ponds and wetlands that have little to no vegetation to provide aquatic cover and substrate for attaching eggs. Ponds should be grazed or otherwise managed, however, to ensure vegetation is not too dense to avoid reducing habitat quality for California tiger salamander (U.S. Fish and Wildlife 2017)."

Summary of Comment 9-12

This comment notes that reducing the hydroperiods of ponds that could also potentially support breeding California red-legged frogs (e.g., ponds that stay wet through August) could adversely affect California red-legged frogs. The Service recommends revising the conservation action so that ponds dry out in September – October.

Response to Comment 9-12

Conservation Action CTS-13 (formerly CTS-14), Section 3.6.2.1, *Conservation Goals and Objectives* for California tiger salamander was revised to recommend dry out from September - October so as to not affect breeding California red-legged Frog.

Summary of Comment 9-13

The Service believes that Laguna Seca should not be consisted a priority for mitigation for effects to the California tiger salamander and California red-legged frog.

The Service asks whether "Henry W. Coe State Park counted in the acres of "protected habitat" for California red-legged frog and California tiger salamander."

The Service recommends that this RCIS should encourage the California Department of Parks and Recreation to allow grazing at Henry W. Coe State Park for the benefit of the California tiger salamander and the implementation of a plan to protect and manage all of the stock ponds that support breeding California tiger salamanders and California red-legged frogs that are in danger of failing.

Response to Comment 9-13

The Authority believes habitats within Laguna Seca can be restored to high quality habitat for California tiger salamander and California red-legged frog and elected to retain Laguna Seca as a conservation priority for these two species (Section 3.6.2.2 and Section 3.6.4.2, respectively). Furthermore, successful restoration at Laguna Seca could lead to future conservation actions implemented through a mitigation credit agreement.

In November 2018, the Authority, in partnership with the Peninsula Open Space Trust, was awarded a CDFW Natural Community Conservation Plan Local Assistance Grant to fund the *Coyote Valley Reptile and Amphibian Linkage Study*. This study is evaluating, in part, the feasibility of restoring this area to support habitat for a variety of listed and non-listed amphibians and reptiles, including California red-legged frog, California tiger salamander, and western pond turtle. Information from this study will be used to inform management actions to improve habitat for these species, including reducing populations of invasive species, to allow for expansions of California red-legged frog, California tiger salamander, and western pond turtle into the Coyote Valley.

Henry W. Coe State Park is included as protected habitat for California red-legged frog and California tiger salamander.

The California tiger salamander conservation priority to enhance and restore protected breeding habitat in Henry W. Coe State Park was revised to emphasize that upland habitat would benefit from grazing and stock ponds would benefit from management actions to enhance breeding habitat (Section 3.6.2.2). A similar conservation priority was added for California red-legged frog (Section 3.6.4.2).

Summary of Comment 9-14

The Service requests that Conservation Action CRLF-6 be reworded to state that managing ponds to dry out in September – October would discourage nonnative species while still allowing California red-legged frog to breed.

Response to Comment 9-14

The following was added to Conservation Action CRLF-6 (Section 3.6.4.1, *Conservation Goals and Objectives*): "Pond management strategies such as having seasonal dry periods by the end of September - October would remove and discourage non-native predators."

Summary of Comment 9-15

This comment recommends the inclusion of a conservation priority to control non-native red foxes.

This comment recommends more flexible conservation actions to allow some San Joaquin kit fox conservation actions to be implemented in higher priority recovery areas outside of the Santa Clara County RCIS area.

Response to Comment 9-15

A conservation action (SJKF-8) was added to assess the status of nonnative red fox, and control populations of red fox, as necessary.

The Steering Committee acknowledges the importance of implementing conservation investments and mitigation actions in higher-priority recovery areas for San Joaquin kit fox. This RCIS, however, is focused on guiding conservation investments and mitigation actions within the RCIS area of Santa Clara County, rather than outside the RCIS area. Conservation investments and mitigation actions for San Joaquin kit fox outside the RCIS area should be guided by other conservation strategies specific to regions outside the RCIS area, including the Recovery Plan for Upland Species of the San Joaquin Valley, California (U.S. Fish and Wildlife Service 1998), and the five-year review (U.S. Fish and Wildlife Service 2010).

Summary of Comment 9-16

This comment identifies a typo/error in Conservation Action LPH-4.

Response to Comment 9-16

The error was corrected.

Summary of Comment 9-17

This comment recommends that the RCIS includes a conservation action to work with the Santa Clara Valley Habitat Agency to implement a nitrogen deposition fee program (that compliments the Habitat Plan's nitrogen deposition fee program for Habitat Plan-covered projects) that encourages projects throughout the Santa Clara County RCIS area to mitigate for the effects of increased nitrogen deposition on serpentine habitats.

Response to Comment 9-17

A conservation action to work with the Santa Clara Valley Habitat Agency to implement a nitrogen deposition mitigation fee program was not added to the RCIS. The Steering Committee believes that including a conservation action to work with the Santa Clara Valley Habitat Agency to implement a nitrogen deposition fee program to complement the Habitat Plan's nitrogen deposition fee program is beyond the scope of this RCIS.

Summary of Comment 9-18

This comment recommends including the Recovery Plan for Upland Species of the San Joaquin Valley, California which covers the San Joaquin kit fox (U.S. Fish and Wildlife Service 1998).

Response to Comment 9-18

The Recovery Plan for Upland Species of the San Joaquin Valley, California (U.S. Fish and Wildlife Service 1998) was added to Section 3.8.2, *Approved Recovery Plans*.

Summary of Comment 9-19

This comment states that Section 3.9.2.2, *Management and Monitoring Phase*, discusses the requirements for site specific management planning, but does not include analysis of funding required to implement the plan which is required by the Service for conservation banks and permittee responsible mitigation.

Response to Comment 9-19

Section 3.9, *Monitoring and Adaptive Management Framework*, is intended to provide an overview of monitoring and adaptive management, which can be used to inform the monitoring and adaptive management plans used in an MCA. The Steering Committee anticipates that the forthcoming MCA Guidelines will discuss funding requirements to include in an MCA, including funding to implement the monitoring and adaptive management plan. The following sentence was added to Section 3.9 to emphasize that the required components of a monitoring and adaptive management plan will be included in CDFW's forthcoming MCA Guidelines: "Requirements and processes for creating an MCA, including an adaptive management and monitoring plan, will be provided in CDFW's MCA Guidelines, which are expected to be released in the winter of 2019/2020." The Steering Committee anticipates that the forthcoming MCA Guidelines will facilitate compatibility with USFWS requirements for conservation banks.

Summary of Comment 9-20

The Service comments that the "interim management period is missing and summarizes elements of the interim management period. The Service also explains when the long-term management period begins.

Response to Comment 9-20

In Section 3.9.1, *Periods of Monitoring and Adaptive Management*, the phases of monitoring and adaptive management were replaced with two monitoring periods: the interim management period and the long-term management period. The description of the interim management period in this comment was adapted for use in Section 3.9.1.1, *Interim Management Period*.

Summary of Comment 9-21

The Service states "see comment above" in reference to Section 2.9.2.2 and Comment 9-20.

Response to Comment 9-21

See response to Comment 9-20. The long-term management now follows the interim management period.

Summary of Comment 9-22

This comment addresses routine monitoring described in Section 3.9.4.1 of the Public Draft and states that routine monitoring is not the same as conservation easement monitoring.

Response to Comment 9-22

The term "routine monitoring" was removed from the RCIS.

Section 3.9.3.1 was revised to address conservation easement and long-term durability instrument monitoring. The section describing effectiveness monitoring (Section 3.9.3.2) was retained to be consistent with this type of monitoring included in the Santa Clara Valley Habitat Plan (ICF International 2012).

Summary of Comment 9-23

In reference to Section 3.9.4.2 in the Public Draft, the Service states that they are not able to locate the Program Guidelines for MCAs.

Response to Comment 9-23

The Program Guidelines for MCAs will be available at:https://www.wildlife.ca.gov/conservation/planning/regional-conservation.

The February 2018 RCIS Program Guidelines was the guideline current during the Santa Clara County RCIS public review period. It did not include substantive information in Section 5, Mitigation Credit Agreements. The following sentences were added to the introduction of Section 3.9, *Monitoring and Adaptive Management Framework*, to emphasize that the required components of a monitoring and adaptive management plan will be included in CDFW's forthcoming MCA Guidelines: "Requirements and processes for creating an MCA, including an adaptive management and monitoring plan, will be provided in CDFW's MCA Guidelines, which are expected to be released in the winter of 2019/2020."

Summary of Comment 9-24

The Service states that the use of surrogates (e.g., habitat quality) to draw conclusions about several species at one time should not be applied unilaterally.

Response to Comment 9-24

Reference to the use of surrogates (e.g., habitat quality) to draw conclusions about several species at one time was removed from the RCIS.

Summary of Comment 9-25

The Service states that a compensatory mitigation project proposed to compensate for unavoidable adverse impacts to species listed under the Endangered Species Act (ESA) would need to be consistent with the Service's policies, standards, and practices. Any mitigation projects that would result in "credits" would need to follow current conservation banking standards and practices.

Response to Comment 9-25

The use of credits created through an MCA to provide compensatory mitigation for Federal ESA compliance is important to the Steering Committee. The Steering Committee hopes that the forthcoming MCA Guidelines will facilitate compatibility with Service requirements for conservation banks.

Summary of Comment 9-26

The Service states that it's not recommended that anyone wishing to establish a mitigation site purchase property before that property has been vetted through the appropriate regulatory agencies and due diligence process.

Response to Comment 9-26

The following was added after the quoted text in Comment 9-26 from Section 4.4.2, *Mitigation Credit Agreements*: "It is recommended, however, that a mitigation site is vetted through the appropriate regulatory agencies before the site is purchased."

Summary of Comment 9-27

The Service states that it would need to evaluate an MCA to determine if it is consistent with the Service's existing policies, standards, and practices.

Response to Comment 9-27

The Steering Committee understands that the Service would need to evaluate an MCA to determine if it is consistent with existing policies, standards, and practices.

Summary of Comment 9-28

The Service states that an MCA describing mitigation credits would need to use the existing bank enabling instrument (BEI) template or duplicate the information required in the BEI template to comply with Service requirements.

Response to Comment 9-28

The Steering Committee understands that an MCA that describes mitigation credits would likely need to use the existing BEI template or duplicate the information required in the BEI template to comply with Service requirements. The Steering Committee hopes that the forthcoming MCA Guidelines and templates will facilitate compatibility with Service requirements, policies, standards, and practices.

Summary of Comment 9-29

The Service explains that the existing BEI template already does what an MCA will do for identifying the types and amounts of credits that will be created and a release schedule for those credits. Using the existing BEI template as an MCA may lead to expedited approvals from multiple agencies.

Response to Comment 9-29

The intent of this statement is to briefly describe what an MCA does, to provide context for how the RCIS could be used to create credits that can be used "to compensate for take or other adverse impacts of activities authorized pursuant to the California Endangered Species Act, to reduce adverse impacts to fish or wildlife resources, or both, from activities authorized pursuant to a lake or streambed alteration agreement to less than substantial, or to mitigate significant effects on the environment pursuant to the California Environmental Quality Act" (Assembly Bill No. 2087, Legislative Counsel's Digest, February 17, 2016).

The Steering Committee hopes that the forthcoming MCA Guidelines and templates will facilitate compatibility with Service requirements, policies, standards, and practices, as well as lead to expedited approvals from multiple agencies.

Summary of Comment 9-30

The Service states that generally, a conservation easement is the only one of these things (i.e., purchase in fee title, purchase, and/or placement of a conservation easement, establishment of a deed restriction) that is consistent with Service policy, standards, and practices, for mitigation that is to provide a permanent offset for unavoidable impacts to federally listed species.

The Service also asks if an MCA is to include funding to perpetually manage a mitigation site.

Response to Comment 9-30

The bullet point quoted by the Service in Comment 9-30 was revised in Section 4.4.2.1, *Developing Mitigation Credit Agreements*, to state the following: "Acquisition of land development rights to *permanently protect* that land." The RCIS Program Guideline's definition of permanent protection was added as a footnote to "permanently protect." As defined by the Program Guidelines (California Department of Fish and Wildlife 2018), permanent protection means: "(1) recording a conservation easement and (2) providing secure, perpetual funding for management of the land, monitoring, legal enforcement, and defense."

Summary of Comment 9-31

The Service states that it could determine an MCA meets its policies for conservation banks if the existing BEI template is used in place of an MCA.

Response to Comment 9-31

The Steering Committee understands that an MCA that describes mitigation credits would likely need to use the existing bank enabling instrument (BEI) template or duplicate the information required in the BEI template to comply with Service requirements. The Steering Committee hopes that the forthcoming MCA Guidelines and templates will facilitate compatibility with Service requirements, policies, standards, and practices, as well as lead to expedited approvals from multiple agencies.

Summary of Comment 9-32

The Service describes the status of Santa Clara Valley dudleya in the RCIS area and points out that the number of occurrences of this species identified in Table E-2d in Appendix E, *Evaluation of Species for Inclusion as Focal Species*, is incorrect.

The Service also describes how Santa Clara Valley dudleya is covered by the Habitat Plan (ICF International 2012), and states that many occurrences of this species within the Santa Clara RCIS area could remain unprotected after the Habitat Plan meets its protection requirements for Santa Clara Valley dudleya. The Service recommends that if Santa Clara Valley dudleya is not included in this RCIS as a focal species, then the RCIS should target acquisition of serpentine habitats to protect this species, while not competing with the Santa Clara Valley Habitat Agency for preservation of serpentine habitats.

The Service explains that portions of the RCIS area that overlap with the Habitat Plan's plan area are critical to the recovery of Bay checkerspot butterfly. Most projects that would directly impact this species would be covered by the Habitat Plan or the Pacific Gas and Electric Company Bay Area Operations and Maintenance Habitat Conservation Plan (ICF 2017).

The Service recommends that "the Santa Clara RCIS should work cooperatively with the SCVHP and target the acquisition of serpentine grassland habitat for Santa Clara RCIS focal plant species in areas that also support the Bay checkerspot butterfly."

Response to Comment 9-32

The number of Santa Clara Valley dudleya in Appendix E was revised to 209.

The Santa Clara Valley RCIS includes a conservation strategy for serpentine habitats that complements the Habitat Plan's conservation strategy for serpentine habitats and the covered species that use serpentine habitats, including Santa Clara Valley dudleya and Bay checkerspot butterfly. The Steering Committee anticipates that Santa Clara Valley dudleya, Bay checkerspot butterfly, and other special status species that rely on serpentine habitats would benefit substantially if this RCIS's conservation goals and objectives for serpentine soils are achieved (Section 3.7.3, *Serpentine Soils*). -

Section 3.5, *Relationship between this RCIS and the Santa Clara Valley Habitat Plan*, explains how this RCIS is consistent and compatible with the Habitat Plan. Section 3.5 recommends protecting occurrences of species covered by the Habitat Plan, and in close coordination with the Habitat Agency "if protecting the occurrence(s) does not affect the Santa Clara Valley Habitat Agency's ability to achieve the goals and objectives of the Habitat Plan." Note however, that the Santa Clara RCIS does not offer to jointly purchase with the Habitat Agency lands containing Bay checkerspot butterfly and serpentine grassland because the RCIS is a non-binding, voluntary strategy, with no entity responsible for protecting land through the RCIS.

Summary of Comment 9-33

The Service states that according to the Santa Clara Valley Water District, there may be mitigation needs for impacts to San Joaquin spearscale, Hoover’s button celery, and prostrate navarretia. The Service states that these plants would benefit from inclusion as focal species.

Response to Comment 9-33

Although San Joaquin spearscale, Hoover's button celery, and prostrate navarretia are not included as focal species in this RCIS, these species would benefit from implementation of the conservation strategy for unique land cover types (Section 3.7.4, *Unique Land Cover Types*). Hoover's button celery is addressed in this RCIS as a non-focal species (Hoover's button celery was not included as a non-focal species in the Public Draft Santa Clara County RCIS but was added to the Final Santa Clara County RCIS as a non-focal species) (Appendix F, *Non-focal Species Summaries*). Credits can be created through an MCA for conservation actions and habitat enhancement actions that benefit non-focal species such as Hoover's button celery (Section 2.2.6, *Non-focal Species*).

Summary of Comment 9-34

The Service asks why the habitat model for foothill yellow-legged frog differs from the Habitat Plan’s model. The Service also indicates that areas regulated by dams should not be considered as suitable mitigation for the foothill yellow-legged frog.

Response to Comment 9-34

This RCIS's habitat model for foothill yellow-legged frog was revised to remove stream segments regulated by dams, to be consistent with the Habitat Plan's model.

The RCIS distinguishes breeding and foraging habitat from low-use habitat based on stream slope. The explanation for why the RCIS uses slopes different from the slopes used in the Habitat Plan was revised to provide more information, as follows: "Foothill yellow-legged frog typically uses streams with slopes of lower gradient (e.g. < 6.5%) (Kupferberg 1996, Ibis Environmental Inc. 2003), and the Habitat Plan (ICF International 2012) defines breeding and foraging habitat as streams with 0-4% slope. Sections of streams with low gradient slopes were identified as potential breeding and foraging habitat. Initially, NHDPlus Version 2 (McKay et al. 2012) data were used to identify streams with gradients of 0-4% to characterize breeding and foraging habitat. Using this range of slope, many stream lengths known to be occupied by foothill yellow-legged frog were not selected as breeding habitat. The range of slope had to be expanded to 0-11% to capture occupied stream lengths. The use of apparently higher-slope streams to identify breeding and foraging habitat is likely an artifact of the slope data (e.g., inaccuracies), rather than a true reflection of the slopes of streams used by foothill-yellow legged frog for breeding and foraging."

Similarly, an explanation was provided for low-use habitat: "The Habitat Plan identifies moderate gradient streams (4-11% slope) as low-use habitat. Because the RCIS slope data appear to overestimate the slopes of streams, the streams identified as low-use by the Habitat Plan were overlaid onto the RCIS stream layer to identify a range of slope in the RCIS slope data that characterizes streams defined as low-use by the Habitat Plan. This range of slope (11-18%) was then applied to streams outside the Habitat Plan area to define low-use streams for the entire RCIS area."

Finally, a 165-foot buffer around the streams was used to model upland areas that could be used for winter refugia.

Summary of Comment 9-35

The Service recommends that this RCIS include a strategy for projects not covered by the Habitat Plan to mitigate for the effects of nitrogen deposition on the Bay checkerspot butterfly and rare serpentine plant species by paying a nitrogen deposition fee.

Response to Comment 9-35

A conservation action to implement a nitrogen deposition mitigation fee program was not added to the RCIS. The Steering Committee believes that including a conservation action to work with the Santa Clara Valley Habitat Agency to implement a nitrogen deposition fee program to complement the Habitat Plan's nitrogen deposition fee program is beyond the scope of this RCIS. If a local government or regulatory agency develops a nitrogen deposition mitigation fee, however, credits could be created through an MCA for conservation actions and habitat enhancement actions that offset impacts of nitrogen deposition.

The comment states that "any Santa Clara RCIS projects that would contribute to increased nitrogen deposition should similarly mitigate by funding management of invasive species (e.g., grazing) within serpentine grasslands…" Note that because the Santa Clara County RCIS is a non-binding, voluntary conservation strategy it does not have the authority to permit or cover projects that would contribute to increased nitrogen deposition. Similarly, the Santa Clara County RCIS does not have the authority to implement a nitrogen deposition fee or require any type of mitigation.

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Making Conservation a California Way of Life.

April 12, 2018

California Department of Fish and Wildlife
Habitat Conservation Planning Branch
P.O. Box 944209
Sacramento, CA 94244 - 2090
ATTENTION: Santa Clara County RCIS Comments

California Department of Fish and Wildlife:

We appreciate the opportunity to comment on the Santa Clara County Draft Regional Conservation Investment Strategies (RCIS) document. Caltrans is providing the comments below strictly as part of the public review process for the Santa Clara RCIS. These comments do not constitute a request for approval of the Santa Clara RCIS pursuant to Streets and Highways Code Section 800.6 (j). Our comments are as follows:

General Comment:

The emphasis of the RCIS document is primarily on focal species, and the MCAs would be primarily for satisfying requirements of the California Endangered Species Act. Although there is scattered language that generally states that other mitigation under other authorities can be pursued through the RCIS, there is no indication of how that can occur or that the other regulatory agencies are on board with the concept. In practice, the scope of the RCIS is primarily for CESA, which limits the overall utility of the document for Caltrans.

Specific Comments:

1.3.2 RCIS Area, pg. 1-8, 2nd paragraph, 3rd sentence. "The Steering Committee selected the strategy area because it includes most of VTA's U.S. 101 Widening Project and all of the State Route 152 Trade Corridor Project within Santa Clara and San Benito counties." Question/comment: Since VTA's U.S. 101 Widening Project environmental document/NES includes 05-SBt-101-PM 4.9/7.5 in San Benito County. Does the RCIS boundary include the entire project limits? If not why? Outside the watershed boundary? It's not clear from the mapping. Also see comments under 2.5.1.2. Critical Linkages, below.

2.1.1.2 Land Use Designations, pp. 2-2 – 2-4. In conjunction with comments on 3.3.2 and 3.3.3 below, the potential for land use conflict between the RCIS and existing land use is not studied. If the conservation targets are met, then the Agriculture/Resource Extraction sector could be significantly impacted.

2.3.1.3 RCIS Conservation & Mitigation Banks, pg. 2-11. Comment: Sparling Ranch pg 2-11. This bank now has credits for CRLF. The document needs to be updated.

2.3.5.1 Focal Species Selection Process, pp. 2-46 – 2-50. Comment: There are more species identified in Appendix E as having met the criteria for being a focal species than are listed in Section 2.3, and later examined under Chapter 3. Some of these species, such as Bay Checkerspot Butterfly, are species for which Caltrans may need to have compensatory mitigation. It is not clear in the document why these qualifying species were not included, nor what that means in terms of the ability to create MCAs for them.

2.3.5.1 Focal Species Selection Process, pg. 2-48, last paragraph. "The screening criteria and evaluation process for each species evaluated for potential inclusion in this Santa Clara County RCIS as a focal species are presented in Appendix D, *Letters of Support.*" Editorial Comment: this information is actually in Appendix E, *Evaluation of Species for Inclusion as Focal Species.*

2.5.1.2 Critical Linkages: Bay Area and Beyond Habitat Connectivity pg. 2-93. The "triangle area where Santa Cruz, Santa Clara and San Benito counties intersect at Hwy 101 and lower reaches of the Pajaro River is an important area for keeping connections between southeastern Santa Cruz County and the Gabilan Range in San Benito County." Question: Is this area included in the RCIS boundary? If not should it be included to capture areas that will need to be addressed to maintain connectivity further north/east? Or is it not within the established watershed boundary?

3.3.2 Land Cover Gap Analysis and 3.3.3 Focal Species Gap Analysis. Comment: It is not clear how the conservation targets for the habitat type and focal species' habitats were determined scientifically. The percentages to be preserved are not justified by science within this document. The application of these percentages can be problematic. For example, for California Red Legged Frog and California Tiger Salamander, the conservation goal for upland habitat is 75%, and the maps for the modeled habitat for these species in Appendix H depicts the upland habitat as being almost the entirety of unincorporated Santa Clara County. Although it is not clearly presented, what is being proposed is that 75% of unincorporated Santa Clara County be put under protection. As noted in the comment for Section 2.1.1.2 above, these areas are designated as Agricultural/Resource Extraction land use, and the RCIS therefore promotes a policy that could have significant land use conflict. The methodology presented here is problematic for a number of reasons, including being somewhat unrealistic and infeasible, as well as not having the rationale transparently presented. As noted above, the potential for conflict is high and needs to be clearly presented for public review and comment

3.7.1.2 Conservation Priorities, pg. 3-54 – 3-55. Bulleted list under the header, Major projects include, but are not limited to, the following. The list of projects are primarily targeted to Caltrans. In many cases, a specific engineered structure is called for. The lists should be edited so that it specifies the need for improvements at these locations, but remove the specific activities to be performed. Caltrans, as the lead agency for these activities, is responsible for studying the sites and making a determination as to what is feasible and safe at these locations. This document can identify the problems, but it cannot predetermine the solutions in Caltrans' jurisdictions. Other considerations such as land use adjacent to the highway and habitat suitability factor into solutions. Conservation priorities should be identified that address connectivity on a broader scale that encompass the needs for maintaining connectivity.

4.3 Mitigation Credit Agreements. General comments: The text here does not provide any additional clarification or direction beyond what is in the regulations and guidance, and it is not clear then what is specifically being proposed relative to this RCIS. In particular, it appears that the MCAs would be for the focal species only, although there is scattered language throughout the document that suggests that MCAs could be done for non-focal species or other resources regulated by other resource agencies. Also, there seems to be a fundamental disconnect between the specific actions identified under Sections 3.6 and 3.7 (e.g., "Conservation Action CCC-3") and the statements under 4.3 referring vaguely to "conservation actions and habitat enhancement actions". It would be useful to have a matrix showing all of the possible MCAs under this RCIS, referenced to the specific Conservation Actions identified under 3.6 and 3.7. This should address focal species, non-focal species, and other conservation elements that can have MCAs created for them. Also, the document suggests that the RCIS is comprehensive enough to have MCAs for resources other than focal species, or other than those strictly regulated by CDFW. It would be useful to have these possibilities outlined as well, and to get the feedback on them from the other regulatory agencies. Without their written buy-in to having resources under their jurisdictions mitigated through MCAs, then such scenarios are just speculation, and likely represent false promises, and should not be included. Caltrans would prefer to have the various permutations of MCAs that could address mitigation for impacts that fall under multiple overlapping state and federal agency jurisdictions identified in this document, and to have written concurrence from those agencies that such an approach would be feasible, with whatever additional conditions would need to be appended to the MCA, as part of the RCIS review, comment and response documentation.

Thank you for the opportunity to comment. If you have questions regarding these comments, please contact me at (916) 651-8166 or Stuart Kirkham at (916) 653-8417.

Sincerely,

Amy L. Bailey

Amy Bailey
Office Chief, Strategic Biological Planning, Advance Mitigation, Innovation

10. Caltrans, Division of Environmental Analysis, April 12, 2018

Responses to Caltrans' comments, and corresponding revisions to the RCIS, as described for each comment below, are informed by a discussion held on May 23, 2018 between Amy Bailey of Caltrans, Andrea Mackenzie of the Santa Clara Valley Open Space Authority, Elizabeth O'Donoghue, of The Nature Conservancy, Jodi McGraw, of Jodi McGraw Consulting, and Aaron Gabbe, of ICF.

Summary of Comment 10-1

This "general comment" notes that the RCIS is primarily focused on focal species, and there is no indication of how mitigation under other authorities can be pursued through the RCIS.

Response to Comment 10-1

It is important to the Steering Committee that credits created through mitigation credit agreements (MCAs) can be used to satisfy compensatory mitigation needs for natural resource agencies other than CDFW. The Steering Committee added the following text to Chapter 1, page 1-2 from the Legislative Counsel's Digest for AB2087, February 17, 2016 to emphasize the utility of the RCIS to facilitate the creation of credits through MCAs to satisfy other mitigation needs: "Credits created through an MCA can be used to "fulfill compensatory mitigation requirements established under any state or federal environmental law, as determined by the applicable local, state, or federal regulatory agency, including compensatory mitigation requirements to compensate for take or other adverse impacts of activities authorized pursuant to the California Endangered Species Act, to reduce adverse impacts to fish or wildlife resources, or both, from activities authorized pursuant to a lake or streambed alteration agreement to less than substantial, or to mitigate significant effects on the environment pursuant to the California Environmental Quality Act."

CDFW is working with other agencies to determine how MCAs can be used to satisfy compensatory mitigation. Because the MCA Guidelines have not been released, it beyond the scope of the Santa Clara County RCIS to describe how credits can be created through MCAs to address the mitigation needs of other agencies.

Summary of Comment 10-2

Caltrans asks whether the RCIS area includes all Santa Clara Valley Transportation Authority's U.S. 101 Widening Project 05-SBt-101-PM 4.9/7.5, and if not- why?

Response to Comment 10-2

The Santa Clara County RCIS area includes most of the U.S. 101 Improvement Project between Monterey Road and the Santa Clara County – San Benito County border. It extends to approximately 3/4 of a mile north of the 101/129 intersection and does not include the entirety of 05-SBt-101-PM 4.9/7.5. The project boundary in this area was placed at the HUC-10 watershed boundary, and the approximately 3/4 of a mile not within the RCIS boundary is south of the watershed boundary. Note however, that credits created through an MCA could be used to compensate for take or offset impacts from this project occurring within the RCIS area, with approval from the permitting agencies.

Summary of Comment 10-3

Caltrans comments that if the conservation targets are met, then the agriculture/resource extraction sector could be significantly impacted.

Response to Comment 10-3

The Steering Committee elected to develop a conservation strategy that reflects the conservation needs of the region by adopting the general approach used by the Conservation Lands Network (Bay Area Open Space Council 2011) to set conservation targets. In the RCIS area, conservation is intended to be compatible with ongoing agriculture and resource extraction, and it is not intended to replace or preclude agricultural/resource extraction land. The Steering Committee added a paragraph in Section 3.3.2, *Land Cover Gap Analysis*, explaining that the conservation targets can be achieved through protection in fee title and conservation and agriculture easements. The paragraph emphasizes the importance of protecting agricultural and rangeland uses, and that private landowners can ensure that these land uses are protected while providing habitat for native species. For example, a large portion of the Diablo Range is rangelands. Grazing is an important land management tool for controlling invasive vegetation and for managing aquatic and upland habitat for focal species that rely on rangelands for habitat, such as California red-legged frog and California tiger salamander.

Summary of Comment 10-4

This comment states that the bank has credits for California red-legged frog, and that this information on the Sparling Ranch should be updated.

Response to Comment 10-4

This information was updated in Section 2.2.1.3, *Conservation and Mitigation Banks*.

Summary of Comment 10-5

This questions states that it is not clear why certain species in Appendix E, *Evaluation of Species for Inclusion as Focal Species* that met criteria for being a focal species were not included in the RCIS as focal species.

Response to Comment 10-5

A brief explanation for why a species was not included as a focal species is provided under Step 3 in the column titled "Rationale for Exclusion from Focal Species List" in Appendix E. In some cases, such as that for the Bay checkerspot butterfly, the species is covered by the Santa Clara Valley Habitat Plan, and within the RCIS area it occurs entirely within the Habitat Plan's permit area. Including Bay checkerspot butterfly as a focal species in this RCIS would not provide considerable, additional conservation and mitigation benefit beyond what it receives from the Habitat Plan. The Steering Committee clarified this rationale in Table E-1c in Appendix E. The Steering Committee also added an explanation in the introduction to Appendix E for how to follow the tables, as tables E-1 and E-2 are split into four parts and are confusing to read.

Species not included in the RCIS as focal species, but that occur in the RCIS area, are addressed in Appendix F, *Non-focal Species Summaries*. More information was added to the introduction of Appendix F to explain the utility of the appendix and how the tables in the appendix were developed. Credits can be created under an MCA for species addressed in Appendix F. Please see Appendix F, and Chapter 2, *Environmental Setting*, Section 2.2.6, *Non-focal Species*, for more details on why credits can be created for these species, and how they are addressed in the Santa Clara County RCIS.

Summary of Comment 10-6

This comment points out an editorial error.

Response to Comment 10-6

The error was corrected.

Summary of Comment 10-7

This question asks whether an area at the intersection of Santa Cruz, Santa Clara, and San Benito counties at Highway 101 is in the RCIS area.

Response to Comment 10-7

The triangle area in the immediate vicinity of where Santa Cruz, Santa Clara, and San Benito Counties intersect at Hwy 101 in Santa Clara County is within the RCIS area. San Benito County is no longer in the RCIS area. The western boundary of the RCIS area on the Pajaro River is approximately 1-mile west of where the river runs under Hwy 101, along the border of San Benito and Santa Cruz Counties (see Figure 2-8). The conservation strategy for habitat connectivity and landscape linkages (Section 3.7.1, *Habitat Connectivity and Landscape Linkage*) addresses the need to maintain and enhance connectivity within and between landscapes within this critical linkage design (Santa Cruz Mountains-Gabilan Range; Figure 2-22b). Objective 17-1 (Section 3.7.1.1, *Conservation Goals and Objectives*) was revised to clarify that conservation actions should protect landscape linkages within and beyond the RCIS area.

Summary of Comment 10-8

This comment states that it is not clear how the conservation targets for land cover type and focal species' habitats were determined scientifically. This comment also indicates that the large habitat protection goals would create land use conflicts if they are achieved.

Response to Comment 10-8

The Steering Committee added to Section 3.3.2, *Land Cover Gap Analysis* an explanation for why the RCIS used high protection goals similar to those used in the CLN. As described above in response to comment 10-3, the Santa Clara County RCIS Steering Committee elected to align the RCIS's methods for setting conservation targets and quantitative conservation objectives with the Conservation Lands Network's (CLN) methods for setting goals to provide consistent, overlapping conservation planning across the San Francisco Bay Area. The CLN creates a science-based vision to conserve the San Francisco Bay Area's landscapes and biodiversity and provides a good model for conservation planning in the RCIS area.

As described above in response to the comment 10-3, the RCIS is intended to be compatible with agricultural/resource extraction land uses. The Steering Committee added a paragraph in Section

3.3.2, explaining that the conservation targets can be achieved through agriculture easements that protect agricultural land uses and compatible habitat values.

Summary of Comment 10-9

This comment states that specific activities needed to perform the projects in the bulleted list in Section 3.7.1.2, *Conservation Priorities* should be removed, and provides recommended revisions.

Response to Comment 10-9

As discussed with Amy Bailey of Caltrans on May 23, 2018, the Steering Committee revised the conservation priorities for habitat connectivity and landscape linkage in Section 3.7.1.2, to address connectivity on a broader scale by deleting specific activities (e.g., engineered solutions to improve habitat connectivity across a barrier such as a highway) that could be implemented to enhance movement across barriers. Specific activities were deleted so as to not limit the type of solution used to improve habitat connectivity. A broader conservation priority was added to protect habitats within critical linkage designs to expand and connect existing protected areas at the scale of landscapes.

Summary of Comment 10-10

This comment states that the RCIS “does not provide any additional clarification or direction beyond what is in the regulations and guidance, and it is not clear then what is specifically being proposed relative to this RCIS.” The comment states that it would be useful to have a matrix showing all of the possible MCAs under this RCIS, referenced to specific conservation actions. The comment also states that Caltrans would prefer to have written concurrence from other regulatory agencies that credits created through MCAs could be used as mitigation to address their regulatory needs.

Response to Comment 10-10

The Santa Clara County RCIS identifies suites of conservation actions and habitat enhancement actions that if implemented, would contribute towards achieving the RCIS's conservation goals and objectives. The RCIS recommends that the conservation actions and habitat enhancement actions be implemented as voluntary conservation investments or to create credits for focal species, non-focal species, and other conservation elements. The Steering Committee expects that any of the conservation actions and habitat enhancement actions could be implemented to create credits through an MCA if implementation of those actions contributes towards achieving one or many of this RCIS's conservation goals and objectives.

The conservation actions and habitat enhancement actions described for each focal species and other conservation element can be implemented to create credits under an MCA, to contribute towards achieving a corresponding goal and objective for a focal species or other conservation element. In many cases, implementing one conservation action could contribute towards achieving multiple objectives. For example, implementing Conservation Action ULCT-4 by restoring riparian woodland could contribute to achieving Objective 20-1 to protect, enhance and restore unique land cover types, as well as Objective 1-2 to enhance and restore habitat for steelhead. As such, credits could be created under an MCA for riparian woodland and steelhead. Identifying the myriad ways the conservation actions and habitat enhancement actions could be implemented to create credits under an MCA is beyond the scope of this RCIS.

As described for Comment 10-1, it is important to the Steering Committee that credits created through MCAs can be used to satisfy compensatory mitigation needs for agencies other than CDFW. CDFW is working with other agencies to determine how credits created through MCAs can be used to satisfy compensatory mitigation. There have also been discussions through the Bay Area Regional Advance Mitigation Program amongst representatives of other natural resource regulatory agencies about how the RCIS and MCAs could be used to provide advance mitigation for their permitting needs.

Because the MCA Guidelines have not been released, it is beyond the scope of the Santa Clara County RCIS to describe how credits can be created through MCAs to address the mitigation needs of other agencies. The Steering Committee hopes, however, that the creation of credit through an MCA by implementing conservation actions and habitat enhancement actions described in this RCIS can be used to satisfy compensatory mitigation needs of other resource agencies. As described above, identifying the myriad ways the conservation actions and habitat enhancement actions could be implemented to create credits under an MCA is beyond the scope of this RCIS.

11

From: **Thomas O'Neill** <habitat@thehabitatinstitute.org>
Date: Mon, Apr 30, 2018 at 9:54 AM
Subject: Regional Conservation Investment Strategy - Corps Endorsement of CHAP
To: Joelle Garretson <jgarretson@openspaceauthority.org>, Matt Freeman <mfreeman@openspaceauthority.org>

Hi Joelle and Matt: I just wanted to follow up with you in regards to using CHAP (Combined Habitat Assessment Protocols) to meet your mitigation assessment needs for your application under the Regional Conservation Investment Strategy. Specifically, we just received this endorsement from the Corps of Engineers regarding CHAP (the approach we use; on page 2) from their Albuquerque District for a project we worked on Rio Grande and Tributaries. It involved two Native American Pueblos at an initial cost estimate of $62 million for restoration. We are also anticipating another Approval from the Corps of Engineers for the Prado Basin project (near Chino Hills, CA) within the next couple of months. If you have any questions about this approach, please let me know. 1

Best,

Thomas O'Neill

The Habitat Institute

Corvallis, OR 541-753-2199

Capitola, CA 831-212-2402

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ESPAÑOLA VALLEY, RIO GRANDE AND TRIBUTARIES, NEW MEXICO

INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT

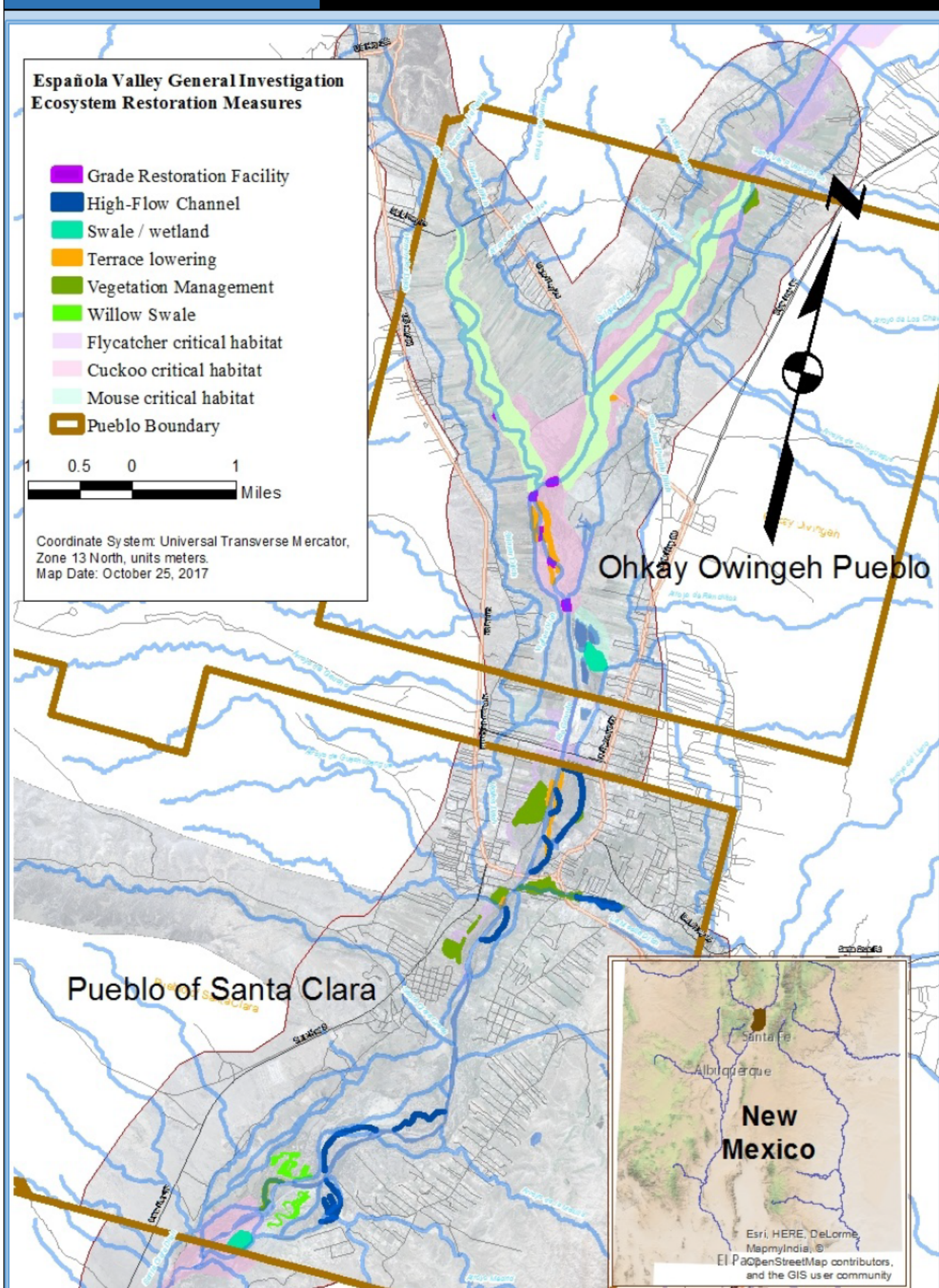
CULTURALLY IMPORTANT VALUES OF THE PROJECT

The Rio Grande and the Rio Chama have been affected by severe channel degradation resulting in the loss of bosque riparian habitat. The health of the bosque and the rivers are fundamentally intertwined with significant cultural practices. For the people of **Ohkay Owingeh** and **Santa Clara Pueblos**, the Rio Grande and the bosque is a place of deep cultural importance. Along with the Rio Grande and its tributaries, the bosque is an integral part of the cultural landscape for social identity, and transmission of historical knowledge and practice. People define themselves in relation to the landscape, and the landscape is an interface where the past gives meaning and context to the present. Loss of the bosque is more than simply the loss of plants and animals; it presents a real threat to customs, beliefs, and practices essential to the cultural identity and continuity of the pueblos.

PROJECT COST

[redacted]	[redacted]			[redacted]
Ecosystem Restoration, Design, Construction	$54,371,000	$2,247,500	$2,059,500	$58,678,000
Recreation	$141,000	$0	$141,000	$282,000
LERRDs	$0	$1,440,000	$1,600,000	$3,040,000
Total Project First Costs	$54,512,000	$3,687,500	$3,800,500	$62,000,000
Average Annual Habitat Units				**19,781 units**

ECOSYSTEM RESTORATION PLAN FORMULATION



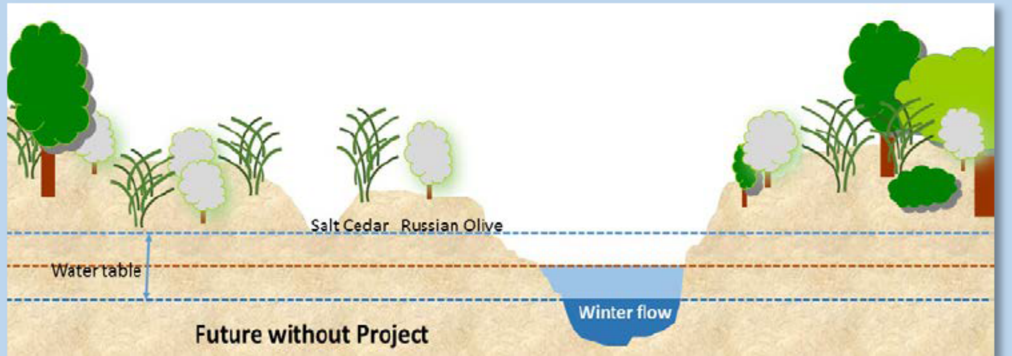
[redacted]

The project will improve scarce and critical wildlife habitat on a local, regional, and international scale. About 70 percent of bird species in the arid Southwest are riparian-dependent during some part of their life cycles. The riparian habitat along the Rio Grande Flyway is a critical corridor between Wild and Scenic River areas, multiple state and national wildlife refuges, with links to Central and South America to North America. The project will improve habitat for the Endangered Species Act; Bald Eagle Protection Act; Migratory Bird Treaty Act and Conservation Act; North American Waterfowl Management Plan; Floodplain Management (EO 11988); and Wetlands Protection (EO 11990) and Conservation Act (1989).
The project will restore critical functions that provide for the health of the floodplain and the bosque.

[redacted]	[redacted]
80.2	**Grade restoration facilities** protect Rio Grande from channel incision.
643.5	**GRFs reduce habitat loss** from channel incision.
57.4	**Terrace lowering** brings the floodplain elevation closer to the river surface.
21.2	**High-flow channels** convey water into the riparian zone.
47.5	**Willow swales** connect riparian vegetation to the groundwater.
17.0	**Wetlands** connect aquatic vegetation to the groundwater.
[redacted]	
91.0	**Invasive species removal** reduces competition with native plants.. **Planting native riparian plants** accelerates **re-vegetation.**
[redacted]	
	All measures produce a mosaic of riparian habitat patches. Diverse riparian vegetation types contribute to species habitat.
958 19,78 [redacted]	[redacted]

ESPAÑOLA VALLEY, RIO GRANDE AND TRIBUTARIES, NEW MEXICO

FUTURE WITHOUT PROJECT (NO ACTION)



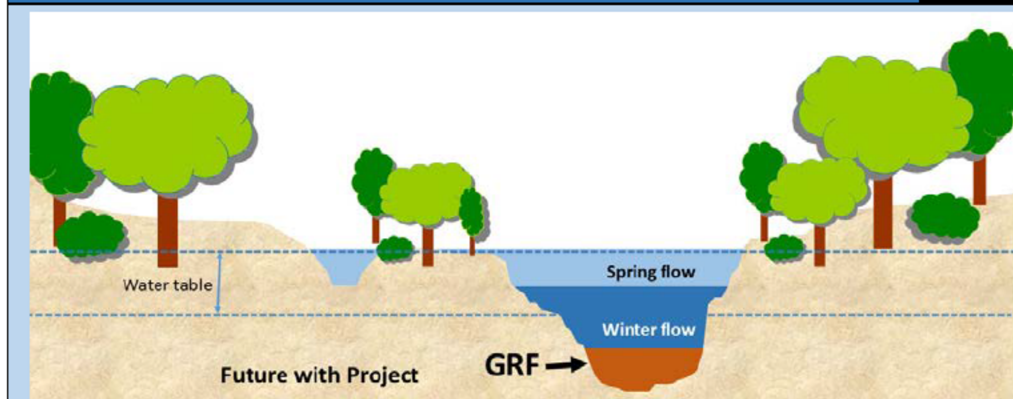
Without the project, there will be continued isolation of riparian vegetation in the study area from fluvial geomorphic processes.

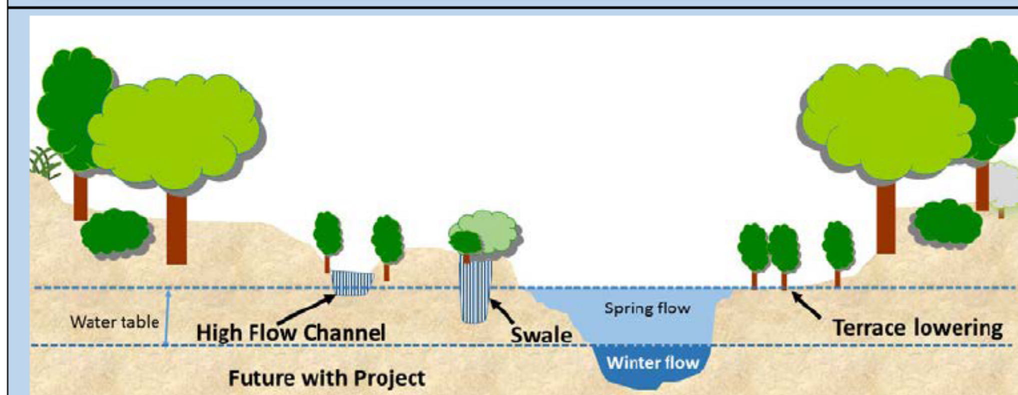
This will eventually result in loss of native plants and their ecological functions, with increasing dominance by non-native plant species including salt cedar, Russian olive, Siberian elm, and tree of heaven.

The loss of riparian habitat will reduce the capacity of the bosque ecosystem to support 276 wildlife species, including the endangered Southwestern Willow flycatcher, the New Mexico meadow jumping mouse, and the threatened the Western Yellow-billed Cuckoo.

Loss of bosque habitat will also diminish cultural and ceremonial practices.

PROJECT BENEFITS





RECONNECT THE RIO GRANDE AND ITS TRIBUTARIES TO THEIR FLOODPLAINS

The **grade restoration facilities** stabilize the channel bed through and upstream of the incised channel with constructed riffles.	**Grade restoration facilities** protect the Rio Chama and Rio Grande from channel incision and raise the bed elevation.
The **terrace lowering** measures produce greater floodplain connectivity and inundation during spring runoff by lowering floodplain surface elevations.	**Terrace lowering** increases inundation by lowering the floodplain elevation adjacent to the river.
High-flow channels transport flow from the river into the interior riparian areas during spring runoff.	Suitable topography for **high-flow channels** supports higher value habitat.
The **willow swales** and **wetlands** lower the ground elevation to increase groundwater connectivity to support thick stands of willows and cottonwoods.	**Willow swales** and **wetlands** produce patches of willow and cottonwood habitat with groundwater connectivity.

INCREASE THE AMOUNT AND QUALITY OF BOSQUE HABITAT

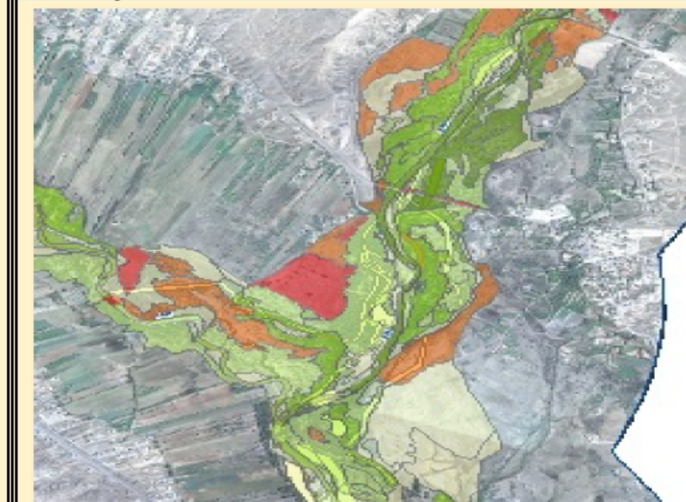
Vegetation management by **removal of invasive plants** with planting of native species increase the structural complexity and quality of the bosque habitat.	**Vegetation management** is a highly effective measure where groundwater / river connectivity is suitable.
Vegetation management by **planting of native plants** on the floodplain connectivity measures increases the structural complexity and quality of the bosque habitat patches.	**Re-establishing native plant species** following excavation of floodplain connectivity measures accelerates development of the desirable vegetation.

INCREASE BOSQUE HABITAT DIVERSIT

The **floodplain connectivity** and **vegetation management** measures are distributed across the project area.	The broad distribution of ecosystem measures produces a diverse mosaic of quality riparian habitat patches.

Combined Habitat Assessment Protocols

The Combined Habitat Assessment Protocols (CHAP) use a GIS habitat-based approach for ecosystem assessment.



Key Ecological Functions (KEF)

The KEF values represent the wildlife diversity with the number of interactions between vertebrate species, their habitat, and functions based on the Biota Information System of New Mexico and the Interactive Biodiversity Information System databases.

Key Environmental Correlates (KEC)

The KEC values from the field inventory data for each polygon measure habitat complexity. The correlates represent habitat elements (physical and biological) that are thought to most influence a species distribution, abundance, fitness, and viability.

Habitat Units

Habitat values calculated from the KEFs and KECs provide an estimate of observed habitat value (complexity) and how wildlife utilize the area (diversity).
Habitat units are generated by multiplying the polygon values by the baseline acreages for analysis.

11. The Habitat Institute, April 30, 2018

Summary of Comment 11-1

This comment follows up Comment 8 in regard to using the CHAP method to meet mitigation needs under the RCIS. This comment states that the Habitat Institute received an endorsement from the U.S. Army Corps of Engineers for CHAP.

Response to Comment 11-1

Please see response to Comment 8-1 for use of the CHAP method with this RCIS.

References

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Appendix D

Letters of Support

SANTA CLARA VALLEY
HABITAT AGENCY

December 13, 2017

Ron Unger
Landscape Conservation Planning Program Manager
California Department of Fish and Wildlife
1416 9th Street, 12th Floor
Sacramento, CA 95814

RE: Santa Clara County Regional Conservation Investment Strategy Consistency with the Valley Habitat Plan

Dear Mr. Unger:

I am writing to provide the Santa Clara Valley Habitat Agency's (Habitat Agency) support for the draft Santa Clara County Regional Conservation Investment Strategy (SCCRCIS) submitted to your agency by the Santa Clara Valley Open Space Authority (OSA). The Habitat Agency implements the Santa Clara Valley Habitat Plan (Habitat Plan), an approved Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP; ICF 2012). We participated in the development of the SCCRCIS over the past 22 months as a member of the steering committee and reviewed the draft SCCRCIS and determined that it is consistent with and complements the Habitat Plan. The draft SCCRCIS includes provisions ensuring that the RCIS's goals, objectives, and actions will not preclude the Habitat Plan from achieving its goals, objectives, and actions or the Habitat Plan's conservation strategy. We believe the SCCRCIS will support collaborative conservation efforts that will help the Habitat Agency achieve the Habitat Plan's biological goals and objectives.

<u>Habitat Agency and Habitat Plan (HCP/NCCP)</u>

The Santa Clara Valley Habitat Agency is a joint exercise of powers entity (JPA) created by the County of Santa Clara and the cities of San Jose, Morgan Hill, and Gilroy, under Government Code Section 6500 *et seq.* The Habitat Agency was formed to implement the Habitat Plan, which is a 50-year regional plan to protect endangered species and natural resources while allowing for future development in Santa Clara County. The Habitat Plan was adopted in 2013 by the JPA entities as well as the Santa Clara Valley Water District and the Santa Clara Valley Transportation Authority. The adopting entities and Habitat Agency are Co-Permittees to the Section 10 and Natural Community Conservation Planning Act permits issued by the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife in 2013. The Habitat Plan covers 18 wildlife and plant species, including many species endemic to the serpentine communities in the South Bay Area region, and activities implemented by the Co-Permittees within the permit area. Participation in the Habitat Plan by the Co-Permittees is required and is not voluntary.

Santa Clara County Regional Conservation Investment Strategy

The SCCRIS is a regional conservation strategy created under AB 2087, to inform science-based nonbinding and voluntary conservation actions and habitat enhancement actions that advance the conservation of focal species, natural communities, and other conservation elements at a regional scale. The RCIS was developed as part of the California Department of Fish and Wildlife's (CDFW's) Regional Conservation Investment Strategies Program, established by AB 2087 and signed into law on September 22, 2016 by Governor Brown. AB 2087 established the RCIS Program to create a new, voluntary conservation planning tool to promote the conservation of species, habitats, and other natural resources and enable advance mitigation for public infrastructure projects. The SCCRCIS provides a non-regulatory assessment and analysis of conservation needs in a region, including habitat connectivity and climate resilience. The SCCRCIS is intended to provide scientific information for the consideration of public agencies, are voluntary, and do not create, modify, or impose regulatory requirements or standards, regulate the use of land, establish land-use designations, or affect the land-use authority of or exercise of discretion by any public agency. The preparation and use of SCCRCIS's is voluntary.

Once approved, entities can use SCCRCIS approved to guide voluntary investment in conservation actions, including habitat protection, restoration, and enhancement. The program enables project proponents to enter into Mitigation Credit Agreements (MCAs) with CDFW so that the conservation actions can generate mitigation credits that can be used to offset the impacts of public infrastructure, development, and other projects. Such MCAs can help ensure mitigation contributes to broader regional conservation goals identified in an SCCRCIS, reduce the transaction costs of mitigation, decrease the time required to obtain mitigation approval, and provide assurances to project proponents that advance mitigation investments will be counted and credited for future development permits.

SCCRCIS relationship to the Habitat Plan

The SCCRCIS conservation strategy, including focal species, goals, objectives, and conservation actions were designed to be consistent with, and complementary to, the Habitat Plan. To achieve this goal, the Habitat Agency participated on the SCCRCIS Steering Committee, was active in crafting the AB2087 legislation, and will sign a memorandum of understanding with OSA to jointly implement the SCCRIS and Habitat Plan. The SCCRCIS area includes most of the Habitat Plan's permit area, as well as, the remaining area in Santa Clara County, and a portion of northern San Benito County in the Upper Pajaro River Watershed.

Steering Committee. The steering committee was convened by the OSA to guide development of the RCIS. It includes OSA, the Habitat Agency, The Nature Conservancy, the State Coastal Conservancy, and the Valley Transportation Authority. Through monthly meetings of the Steering Committee, which occurred since the inception of the planning process in March 2016, the Habitat Agency communicated its interests as well as concerns about the SCCRCIS, including how it might influence its ability to fulfill permit requirements. The Habitat Agency's issues were integrated into draft documents, which were reviewed ensure that SCCRCIS will support collaborative conservation efforts and complement the achievement of Habitat Plan biological goals and objectives. Section 3.5 of the SCCRCIS, which was developed with the Habitat Agency, details how the SCCRCIS complements and does not conflict with the Habitat Plan.

AB2087. Several provisions in AB2087 (Section 1856j) which govern CDFW approval of MCAs are designed to ensure that implementation of RCISs does not negatively impact any approved HCP/NCCP in the region, including the Habitat Plan. This includes:

- MCAs require advance written approval of the implementing entity of a HCP/NCCP
- Credits created through MCAs can only be used for covered activities under a HCP/NCCP in accordance with the requirements of the HCP/NCCP
- Individuals and entities eligible for coverage as participating special entities under a HCP/NCCP may use MCA mitigation credits only if the implementing entity declines to extend coverage to the covered activities proposed by the eligible individual or entity

Joint Implementation. OSA and the Habitat Agency will be expanding their collaborative Habitat Plan implementation to the SCCRCIS. OSA purchased and manages the Habitat Agency's first property, Coyote Ridge, which was enrolled into the Reserve System via a Conservation Easement. We work together on regional conservation priorities, such as the preservation and restoration of Coyote Valley, which serves as an important wildlife linkage. This relationship is being codified in an MOU that lays out the roles and responsibilities for collaborative implementation of the Habitat Plan and SCCRIS. For example, the Habitat Agency is set up for managing mitigation projects, could create MCAs that can be used to generate credits for non-covered activities and/or non-covered species. This would expand the cost-effectiveness of work to meet the existing mitigation and recovery requirements of the Habitat Plan's conservation strategy while supporting the SCCRCIS.

We look forward to continuing to participate as members of the Steering Committee to refine the SCCRCIS based on feedback from the Department as well as the public.

I hope you will not hesitate to contact me if you have any questions.

Sincerely,

Edmund Sullivan
Executive Officer

Reference

ICF International 2012. Final Santa Clara Valley Habitat Plan. Prepared for the County of Santa Clara, City of San Jose, City of Morgan Hill, City of Gilroy, Santa Clara Valley Water District, and Santa Clara Valley Transportation Authority. August. Available: http://scvhabitatagency.org/178/Santa-Clara-Valley-Habitat-Plan.

Coastal
Conservancy

July 7, 2017

Charlton H. Bonham
Director
California Department of Fish and Wildlife
1416 Ninth Street
Sacramento, CA 95814

Subject: Santa Clara County Regional Conservation Investment Strategy

Dear Mr. Bonham:

In accordance with Cal. Fish and Game Code Section 1852(a), we are writing to request that the California Department of Fish and Wildlife (CDFW) approve the Santa Clara County Regional Conservation Investment Strategy (RCIS). The 934,028-acre RCIS area comprises all of Santa Clara County, plus portions of three watersheds in northern San Benito County. This area is of statewide importance for conservation, as it supports numerous rare and endangered species, including serpentine endemics found nowhere else in the world; contains important wetland, riparian, and oak woodland habitat, including that located in the Upper Pajaro River floodplain; and features critical areas for wildlife connectivity, including a landscape linkage connecting the Santa Cruz and Diablo mountain ranges across Coyote Valley.

The RCIS would facilitate current efforts to safeguard these and other conservation values by contributing to smart growth principles, including informed planning for conservation, urbanization, and public infrastructure that are important to the California State Coastal Conservancy (Coastal Conservancy) and the numerous local, state, and federal conservation agencies and organizations working in the region. This RCIS will help target acquisition, restoration, or enhancement where it will have the largest benefit for focal species and other conservation elements.

The RCIS area encompasses almost all of the permit area of the Santa Clara Valley Habitat Plan (Habitat Plan)—a regional Habitat Conservation Plan and Natural Community Conservation Plan approved in 2013 by the U.S. Fish and Wildlife Service and CDFW. This RCIS was developed in coordination with the Valley Habitat Agency, the entity implementing the Habitat Plan, and was designed to complement the Habitat Plan, both within and beyond the Habitat Plan's permit area, by building on its conservation goals, objectives, and reserve design in order to "fill in the gaps" that are not addressed by the Habitat

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Oakland, California 94612-1401
510·286·1015 Fax: 510·286·0470

Plan, both in geography and in resources. As such, this RCIS was prepared consistent with Section 1852(c)(11), that states that for an RCIS to be approved by CDFW, an RCIS shall include "provisions ensuring that the strategy is consistent with and complements any administrative draft natural community conservation plan, approved natural community conservation plan, or federal habitat conservation plan that overlaps with the RCIS area."

By using a science-based approach to identify areas of high conservation value in the region, this RCIS will also aid the development of public infrastructure projects by helping agencies avoid and minimize their project impacts and then identify priority conservation actions for compensatory mitigation, including as part of advance mitigation programs. It is expected that a number of transportation projects will be designed and proposed for construction in the next three to 10 years in the RCIS area. Some of these projects will not have their compensatory mitigation needs met by the Habitat Plan because the activities are not in the permit area or otherwise covered by the Habitat Plan's permits. The RCIS was developed in consideration of these and other transportation projects as part of a collaborative effort with the Metropolitan Transportation Commission (MTC), Caltrans, and The Nature Conservancy to establish a regional advance mitigation planning (RAMP) program in the San Francisco Bay Area.

The RCIS will also inform the mitigation needs of other projects occurring in the RCIS area, including ongoing development in the 13 cities covered by this Santa Clara County RCIS (outside the Habitat Plan's plan area), installation or replacement of large-scale utilities, and water supply and flood infrastructure projects.

The Coastal Conservancy appreciates CDFW's efforts to review and approve this conservation strategy. If you have any questions, please contact Laura Cholodenko at (510) 286-0752.

Sincerely,

Matt Gerhart
Bay Area Program Manager

Cc: Kevin Hunting, Chief Deputy Director, CDFW
Rick Macedo, Habitat Conservation Planning Branch Chief, CDFW
Ronald Unger, Landscape Conservation Planning Program Manager, CDFW

OPEN SPACE AUTHORITY
SANTA CLARA VALLEY

June 5, 2018

Santa Clara Valley Habitat Agency
Attention: Edmund Sullivan
535 Alkire Avenue
Morgan Hill, CA 95037

RE: Memorandum of Understanding

Dear Mr. Sullivan:

Please find enclosed a fully executed Memorandum of Understanding dated June 1, 2018 for your records.

We look forward to working with you. Please do not hesitate to contact us if you have any questions.

Sincerely,

Justina Tien
Accounting and Financial Analyst

RECEIVED
JUN 07 2018

33 Las Colinas Lane
San Jose, CA 95119
408.224.7476 T
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openspaceauthority.org

MEMORANDUM OF UNDERSTANDING

BETWEEN THE SANTA CLARA VALLEY OPEN SPACE AUTHORITY

AND THE SANTA CLARA VALLEY HABITAT AGENCY

This Memorandum of Understanding (MOU), for reference dated June 1, 2018, is between the Santa Clara Valley Open Space Authority ("OSA"), a special district, and the Santa Clara Valley Habitat Agency ("Habitat Agency"), a joint powers entity, both formed under California state law and hereinafter collectively referred to as the "Parties" and individually as a "Party."

WHEREAS, the OSA covers the cities of Campbell, Milpitas, San José and Santa Clara and unincorporated Santa Clara County outside of the jurisdiction of the Midpeninsula Regional Open Space District, , and is funded through a parcel tax and benefit assessment; and

WHEREAS, the purpose of OSA is to preserve key portions of the natural environment with the goal of preservation of undeveloped land in its natural state; and

WHEREAS, the Santa Clara Valley Habitat Agency ("Habitat Agency") formed by the Cities of Gilroy, Morgan Hill, San José and the County of Santa Clara, is funded by fees imposed upon development; and

WHEREAS, the Habitat Agency is responsible for implementation of the Santa Clara Valley Habitat Plan ("Habitat Plan"), a 50-year comprehensive regional conservation plan, qualified as both a Habitat Conservation Plan and a Natural Community Conservation Plan, to protect endangered species and natural resources, yet allowing for development; and

WHEREAS, the Habitat Plan requires the Habitat Agency to acquire at least 33,2015 acres of land in fee title or conservation easement by 2058; and

WHEREAS, the Habitat Plan acquisition area is almost the same as and occurs entirely within OSA jurisdiction area; and

WHEREAS, to meet the obligations of its state and federal endangered species permits, the Habitat Agency by 2053 must restore at least 10.4 miles of streams, 20 acres of ponds, and 70 acres of riparian woodland, and wetlands, and by 2058 must work with conservation land management organizations such as OSA and Santa Clara County Parks to incorporate 13,291 acres of existing open space into the Habitat Plan Reserve System ('Reserve System"), which must be permanently protected; and

WHEREAS, on September 9, 2010, the OSA Board of Directors unanimously adopted a set of Principles of Participation ("Principles") regarding the Habitat Plan, which was included as an exhibit to a 2013 Memorandum of Understanding between the Agency, OSA and other governmental entities involved with the Habitat Plan; and

WHEREAS, the Principles include a statement of the willingness of OSA to cooperate with and partner with the Habitat Agency to help implement the Habitat Plan successfully; and

WHEREAS, OSA's participation in the Habitat Plan presents a beneficial opportunity for OSA to receive long-term funding for land management; and

WHEREAS, OSA and the Habitat Agency worked together in 2015 to protect Coyote Ridge in the Diablo Range of Santa Clara County, with OSA acquiring the land and the Habitat Agency holding a conservation easement; and

WHEREAS, the Parties will mutually benefit from collaboration around conservation of sensitive lands and both entities see value in fostering a collaborative approach to their endeavors given the substantial overlap in their areas of jurisdiction and purposes and because land acquisition and habitat restoration are most effective and successful when done in partnership; and

WHEREAS, in 2016 the State passed AB 2087, establishing a voluntary conservation planning tool called the Regional Conservation Investment Strategy ("RCIS") to promote the conservation of species, habitats, and other natural resources and the Santa Clara County RCIS is one of four pilot RCISs currently being developed in California; and

WHEREAS, the Santa Clara County RCIS is being developed based upon existing plans including the Habitat Plan, and sponsored by OSA in collaboration with other organizations and agencies, including the Habitat Agency; and

WHEREAS, the Santa Clara County RCIS is designed to be consistent with the complement the Habitat Plan since there is partial overlap of the Habitat Plan and RCIS plan areas, making engagement of both Parties critical to this effort; and

WHEREAS, the approved Habitat Plan and approved Principles contain an expectation that the Parties will enter into a more formal agreement pertaining to their working relationship;

NOW, THEREFORE, OSA and the Habitat Agency agree as follows:

1. Coordination and Collaboration.

A. OSA and the Habitat Agency agree to conduct early and regular coordination and collaboration to ensure mutually beneficial outcomes and to avoid conflicts. This coordination and collaboration includes but is not limited to situations where:

1. Land may be acquired using funds from both agencies, or
2. Land may be acquired by the Habitat Agency without funds from the OSA but may be managed by the OSA, or
3. Restoration projects may be funded by the Habitat Agency on land owned by OSA, or
4. Habitat enhancement projects such as wildlife corridors may be funded by the Habitat Agency.

B. OSA and the Habitat Agency will work together on all early planning efforts to determine priorities, strategies, schedules, and funding approaches for land acquisition, habitat restoration, wildlife corridor enhancement, or other management actions that may benefit OSA and the Habitat Agency, and may count towards the conservation obligations of the Habitat Plan and the RCIS goals.

C. The role of OSA in helping to successfully implement the Habitat Plan and the RCIS may include conservation planning to identify priorities and strategies, assisting in the development of RCIS Mitigation Credit Agreements, cooperating on land management issues, restoring habitats in partnership with the Habitat Agency, brokering a land purchase but not owning the land, contributing lands to a Habitat Plan acquisition and owning the land, or owning and managing land acquired on behalf of the Habitat Agency.

2. <u>Land Management and the Reserve System.</u>

A. OSA acknowledges its role as a likely land manager for Reserve System lands acquired by the Habitat Agency. OSA could serve as a land manager on land that it owns within the Reserve System or on land owned by others within the Reserve System.

B. For any land that OSA acquires in partnership with the Habitat Agency and that meets the requirements of the Habitat Plan and/or the RCIS, OSA and Habitat Agency may enter into a management agreement for OSA to manage the land on behalf of the Habitat Agency. The ultimate responsibility for management of Habitat Plan lands rests with the Habitat Agency. The ultimate responsibility for management of RCIS lands is the RCIS Implementing Entity or other party as established under the terms of a Mitigation Credit Agreement approved by the California Department of Fish and Wildlife.

C. For any land in the Habitat Plan Reserve System managed by OSA, the Habitat Agency would reimburse OSA for the costs of that management that is performed consistent with the Habitat Plan. The Habitat Agency directly reimburses OSA staff time and expenses for managing approved restoration projects on behalf of or in collaboration with the Habitat Agency.

D. Per the Principles of Participation, OSA intends to enroll an estimated 1,000 acres of its land existing at the time of Habitat Plan approval (2013) into the Habitat Plan Reserve System. These lands will meet the reserve design requirements and principles of the Habitat Plan and will enable enhancement actions funded by the Habitat Agency that will benefit the covered species. The following lands were identified in the Habitat Plan or discussed for enrollment.

a. Rancho Cañada del Oro
b. Sierra Vista
c. Coyote Valley
d. Palassou Ridge

E. The OSA has no specific funding commitment towards the Habitat Plan. However, per the Principles of Participation the OSA commits to working with the Habitat Agency for the duration of the permit to pursue joint land acquisition that is mutually beneficial to each agency on a case by-case basis and help the Habitat Agency meet its local land acquisition commitments in cooperation with other local agencies, non-profit organizations, and foundations. The OSA intends to leverage its funds to acquire an estimated 5,000 acres for inclusion in the Reserve System, and will make efforts to acquire an additional 2,500 acres for the Reserve System, if feasible. The 2014 acquisition by OSA of the 1,831-acre Coyote Ridge Open Space Preserve with recordation of a conservation easement held by the Habitat Agency counts towards these land protection goals.

F. Any lands OSA acquires in partnership with the Habitat Agency must meet the requirements of the Habitat Plan, which includes granting permanent conservation easements and incorporation of these lands into a reserve unit management plan. The conservation easement would require management in perpetuity by the Habitat Agency consistent with the Habitat Plan. Such lands might also meet the requirements of the RCIS.

G. OSA has the option of entering into management agreements with the Habitat Agency to manage, consistent with the Habitat Plan, Reserve System lands not owned by OSA. In such cases, OSA would be reimbursed by the Habitat Agency for the costs of management.

H. OSA is not a Permittee as that term is defined in the Habitat Plan, and management of Reserve System lands does not require that OSA become a Permittee. Any take authorization needed for OSA to manage Reserve System lands on behalf of the Habitat Plan will be extended by the Habitat Agency through its management contracts with OSA. OSA also has the option to apply for and receive take authorization under the Habitat Plan as a Participating Special Entity.

I. For any land acquired by and managed by OSA, OSA is responsible for all costs associated with recreational uses of the site, including trails and other recreational facilities, which occur consistent with the Habitat Plan and OSA's recreational goals.

3. Regional Conservation Investment Strategy

A. The Santa Clara County Regional Conservation Investment Strategy (RCIS) is being sponsored by the OSA and the Habitat Agency is a member of the steering committee and has written a concurrence letter to the California Department of Fish and Wildlife.

B. The RCIS conservation strategy, including focal species, goals, objectives, and conservation actions were designed to be consistent with, and complementary to, the Habitat Plan. The RCIS area includes most of the Habitat Plan's permit area, as well as, the remaining area in Santa Clara County, and a portion of northern San Benito County in the Upper Pajaro River Watershed.

C. OSA is responsible for RCIS updates and progress assessment, at least once every 10 years. An update will be completed so that the RCIS reflects the most up-to-date information about resources in the RCIS area. An assessment will evaluate progress towards meeting this RCIS's goals and objectives, through conservation investments and mitigation actions. The Habitat Agency will share information and contribute to the development of the RCIS update to ensure that any revised conservation goals, strategies and science-based management and monitoring methods are consistent with the Habitat Plan.

D. Habitat Agency will review and approve Mitigation Credit Agreements (MCAs) to ensure the consistency with requirements of AB2087 in consultation with OSA. MCAs require advance written approval by the Habitat Agency. Credits created through MCAs can only be used for activities not receiving coverage by the Habitat Plan in accordance with the requirements of the Habitat Plan. Individuals and entities eligible for coverage as participating special entities under the Habitat Plan may use MCA mitigation credits only if the Habitat Agency declines to extend coverage to the covered activities proposed by the eligible individual or entity.

E. OSA acknowledges its role as a potential land manager for MCA lands or restoration and enhancement activities conducted as part of an MCA agreement.

4. Public Outreach and Public Relations

A. OSA and the Habitat Agency agree to coordinate their public outreach and education activities that relate to land owned jointly by OSA and the Habitat Agency or owned by the Habitat Agency and managed by OSA.

B. OSA and the Habitat Agency agree to recognize each other on their respective agency web sites as key strategic partners for land acquisition and land management. These acknowledgements will include hyperlinks to each other's main web pages.

5. Perpetual Land Management

Prior to the end of the Habitat Plan permit term in 2058, both Parties commit to determining a suitable arrangement for perpetual management of lands owned by OSA that count toward Habitat Plan obligations. This arrangement would include Agency transfer to OSA of funds to ensure perpetual management.

6. Termination

Either Party may terminate this MOU upon ninety (90) days written notice to the other Party

In agreement with the foregoing, the Parties execute this MOU.

"OSA"

SANTA CLARA VALLEY OPEN SPACE AUTHORITY, a special district

APPROVED AS TO FORM:

WILLIAM P. PARKIN
General Counsel

By

ANDREA MACKENZIE
General Manager

"AGENCY"

SANTA CLARA VALLEY HABITAT AGENCY, a joint powers authority

APPROVED AS TO FORM:

VALERIE J. ARMENTO
General Counsel

By

EDMUND SULLIVAN
Executive Officer

Appendix E
Evaluation of Species for Inclusion as Focal Species

Appendix E
Evaluation of Species for Inclusion as Focal Species

Introduction

Tables E-1 and E-2 list wildlife and fish species and plant species, respectively, evaluated for inclusion as focal species in this Santa Clara County RCIS. Tables E-1 and E-2 are split in four parts, because the tables are too wide (i.e., has too many columns) to present in their entirety in a single table for wildlife and fish species and plant species, respectively. Tables E-1a through E-1d, and E-2a through E-2d read progressively from the left-most column in Tables E-1a and E-2a, to the right-most column in Tables E-1d and E-2d for tables E-1 and E-2, respectively.

Evaluation for inclusion of a given species as a focal species followed a three-step process, which is discussed in Chapter 2, *Environmental Setting*, Section 2.2.5.1, *Focal Species Selection Process*, shown in Tables E-1 and E-2, and briefly summarized here.

Step 1: Identify Focal Species. This step was used to populate Tables E-1 and E-2 with a comprehensive list of declining and vulnerable species that occur or may occur in the RCIS area.

Step 2: Apply Screening Criteria. This step applies screening criteria to the list of potential focal species to determine which species should be considered for inclusion as focal species in this Santa Clara County RCIS. To meet the screening criteria (i.e., to receive a TRUE value in the Meets Screening Criteria column), the species must receive a TRUE value in the Enough Data Available and Occurs in the RCIS Area column and receive a TRUE value in one of the other Filtering of Species columns.

A species receives a TRUE value in the Filtering of Species columns if it meets the corresponding criteria in the Criteria column (i.e., receives a 1). A species receives a FALSE value in the Filtering of Species columns if it does not meet the corresponding criteria in the Criteria column (i.e., receives a 0).

Step 3: Finalize Focal Species Lists. Many species meet the screening criteria in Step 2, but not all of these species are included as focal species in the RCIS Area. This list of potential focal species was further narrowed down to limit the scope of this RCIS to be consistent with the available planning resources and this RCIS's preparation schedule. To narrow the list to those species that would benefit most from this RCIS and add conservation value to the conservation strategy, the following types of species were prioritized.

- Species that are anticipated to have mitigation needs for public infrastructure projects in the next 10 years.
- Species in the RCIS area that are not completely addressed by the Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) (over species that are completely addressed by the Santa Clara Valley HCP/NCCP).
- Species in the RCIS area that occur on unprotected lands and that may be impacted by development (over species where the only known occurrences are on protected lands).
- Species in the RCIS area that are not addressed by other regional conservation strategies.

The Step 3 column in Tables E-1 and E-2 explains the rationale behind the inclusion or exclusion of each species as a focal species in this Santa Clara County RCIS.

Species that met the screening criteria, whose needs are not completely addressed by the Santa Clara Valley HCP/NCCP or other regional conservation strategy, that do not occur only on protected land, and that are likely to need mitigation for transportation infrastructure projects within the next 10 years were included as focal species. This RCIS includes 18 focal species: 10 wildlife species and eight plant species.

Table E-1a. Wildlife and Fish Species Evaluated for Inclusion as Focal Species in the Santa Clara County RCIS, Step 1

		Status				
Scientific Name	**Common Name**	**Federal**	**State**	**Global**	**SWAP-SGCN**	**SWAP-CV**
Adela oplerella	Opler's longhorn moth	–	–	G2	N	N
Branchinecta lynchi	Vernal pool fairy shrimp	T	–	G3	Y	N
Danaus plexippus	Monarch butterfly	*	–	G4T2T3	Y	N
Euphydryas editha bayensis	Bay checkerspot butterfly	T	–	G5T1	Y	N
Helminthoglypta nickliniana bridgesi	Bridges' Coast Range shoulderband snail	–	–	G3T1	Y	N
Hydrochara rickseckeri	Ricksecker's water scavenger beetle	–	–	G2?	N	N
Hygrotus curvipes	Curved-foot hygrotus diving beetle	–	–	G1?	Y	N
Ischnura gemina	San Francisco forktail damselfly	–	–	G2	N	N
Lepidurus packardi	Vernal pool tadpole shrimp	E	–	G4	Y	N
Linderiella occidentalis	California fairy shrimp	–	–	G2G3	N	N
Microcina homi	Hom's microblind harvestman	–	–	G1	Y	N
Microcina juni	Jung's microblind harvestman	–	–	G1	Y	N
Nothochrysa californica	San Francisco lacewing	–	–	-	N	N
Speyeria adiaste adiaste	Unsilvered fritillary butterfly	–	–	G1G2T1	Y	N
Speyeria callippe callippe	Callippe silverspot butterfly	E	–	G5T1	Y	N
Speyeria zerene behrensii	Behren's silverspot butterfly	E	–	G5T1	Y	N
Speyeria zerene myrtleae	Myrtle's silverspot butterfly	E	–	G5T1	Y	N
Acipenser medirostris	Green sturgeon	T	SSC	G3	Y	Y
Archoplites interruptus	Sacramento perch	–	SSC	G5T2T3	Y	N
Eucyclogobius newberryi	Tidewater goby	E	SSC	G3	Y	Y
Hypomesus transpacificus	Delta smelt	T	T	G1	Y	Y
Lampetra ayresi	River lamprey	–	SSC	G4	Y	Y
Oncorhynchus kisutch	Coho salmon—central California coast	T	E	G4?	Y	Y
Oncorhynchus mykiss	Central California Coastal steelhead	T	SSC	G5T2T3 Q	Y	Y
Oncorhynchus mykiss	South-Central California steelhead	T	SSC	G5T2Q	Y	Y

Scientific Name	Common Name	Status Federal	State	Global	SWAP-SGCN	SWAP-CV
Oncorhynchus tshawytscha	Central Valley fall/late fall–run Chinook salmon	SC	SSC	G5	Y	Y
Pogonichthys macrolepidotus	Sacramento splittail	--	SSC	GNR	Y	N
Spirinchus thaleichthys	Longfin smelt	C	T	G5	Y	Y
Ambystoma californiense	California tiger salamander (Central CA DPS)	T	T	G2G3	Y	Y
Rana boylii	Foothill yellow-legged frog	*	SC Threatened	G3	Y	Y
Rana draytonii	California red-legged frog	T	SSC	G2G3	Y	N
Spea hammondii	Western spadefoot toad	*	SSC	G3	Y	N
Anniella pulchra	Northern California legless lizard	–	SSC	G3G4T2 T3Q	Y	N
Emys marmorata	Western pond turtle	*	SSC	G3G4	Y	N
Masticophis flagellum ruddocki	San Joaquin coachwhip (=whipsnake)	–	SSC	G5T2T3?	Y	N
Masticophis lateralis euryxanthus	Alameda whipsnake	T	T	G4T2	Y	N
Phrynosoma coronatum frontale	California horned lizard	–	SSC	-	N	N
Accipiter cooperii	Cooper's hawk	–	SSC	G5	N	N
Accipiter striatus	Sharp-shinned hawk	–	SSC	G5	N	N
Agelaius tricolor	Tricolored blackbird	*	SC Endangered	G5T1T2	Y	N
Ammodramus savannarum	Grasshopper sparrow	–	SSC	G5	Y	N
Artemisiospizaa belli belli	Bell's sage sparrow	–	SSC	G5T2T4?	N	N
Aquila chrysaetos	Golden eagle	–	FP, SSC	G5	N	N
Ardea alba	Great Egret	–	–	G5	N	N
Ardea herodias	Great blue heron	–	Sensitive	G5	N	N
Asio flammeus	Short-eared owl	–	SSC	G5	Y	N
Athene cunicularia	Burrowing owl	–	SSC	G4	Y	N
Botaurus lentiginosus	American bittern	–	–	G4	N	N
Branta canadensis leucopareia	Aleutian Canada goose	–	–	G5T3	N	N
Buteo regalis	Ferruginous hawk	–	SSC	G4	N	N
Buteo swainsoni	Swainson's hawk	–	T	G5	Y	Y
Charadrius alexandrinus nivosus	Western snowy plover	T	SSC	G3T3	Y	Y
Circus cyaneus	Northern harrier	–	CSC	G5	Y	N

Scientific Name	Common Name	Status Federal	State	Global	SWAP-SGCN	SWAP-CV
Egretta thula	Snowy egret	–	Nesting colonies of “interest” to CDFW	G5	N	N
Elanus leucurus	White-tailed kite	–	FP	G5	N	N
Eremophila alpestris actia	California horned lark	–	CSC	G5T3Q	N	N
Falco mexicanus	Prairie falcon	–	–	G5	N	N
Falco peregrinus anatum	American peregrine falcon	D	FP	G4T4	N	N
Geothlypis trichas sinuosa	Saltmarsh common yellowthroat	–	SSC 1st priority	G5T3	N	N
Haliaeetus leucocephalus	Bald eagle	D	E; FP	G5	Y	N
Lanius ludovicianus	Loggerhead shrike	–	SSC	G4	Y	N
Laterallus jamaicensis coturniculus	California black rail	–	T; FP	G3G4T1	Y	Y
Nycticorax nycticorax	Black-crowned night heron	–	CSC—rookeries only	G5	N	N
Pandion haliaetus	Osprey	–	CSC	G5	N	N
Pelecanus occidentalis californicus	California brown pelican	D	E; FP	G4T3	Y	Y
Phalacrocorax auritus	Double-crested cormorant	–	CSC	G5	N	N
Progne subis	Purple martin	–	SSC	G5	Y	N
Rallus obsoletus obsoletus	Ridgway’s rail	E	E; FP	G5T1	Y	Y
Riparia riparia	Bank swallow		T	G5	Y	N
Sterna antillarum (=albifrons) browni	California least tern	E	E; FP	G4T2T3Q	Y	Y
Vireo bellii pusillus	Least Bell’s vireo	E	E	G5T2	Y	Y
Antrozous pallidus	Pallid bat	–	SSC	G5	Y	N
Corynorhinus townsendii townsendii	Townsend’s big-eared bat	–	C	G3G4	Y	N
Eumops perotis californicus	Western mastiff-bat	–	SSC	G5T4	N	N
Lasionycteris noctivagans	Silver-haired bat	–	–	G5	N	N
Lasiurus blossevillii	Western red bat	–	SSC	G5	N	N
Lasiurus cinereus	Hoary bat	–	–	G5	N	N
Myotis ciliolabrum	Western small-footed myotis	–	–	G5	N	N
Myotis evotis	Long-eared myotis	–	–	G5	Y	N

		Status				
Scientific Name	**Common Name**	**Federal**	**State**	**Global**	**SWAP-SGCN**	**SWAP-CV**
Myotis thysanodes	Fringed myotis	–	–	G4	Y	N
Myotis volans	Long-legged myotis	–	–	G5	Y	N
Myotis yumanensis	Yuma myotis	–	–	G5	N	N
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	–	SSC	G5T2T3	N	N
Nyctinomops macrotis	Big free-tailed bat	–	SSC	G5	Y	N
Puma concolor	Mountain lion	-	-	-	N	N
Reithrodontomys raviventris	Salt marsh harvest mouse	E	E; FP	G1G2	Y	N
Sorex vagrans halicoetes	Salt marsh wandering shrew	–	SSC	G5T1	Y	N
Taxidea taxus	American badger	–	SSC	G5	Y	N
Vulpes macrotis mutica	San Joaquin kit fox	E	T	G4T2	Y	N

Status

Federal

E = listed as endangered under the federal Endangered Species Act.
T = listed as threatened under the federal Endangered Species Act.
C = listed as a candidate species, which is a species for which the U.S. Fish and Wildlife Service has on file sufficient information to warrant a listing.
= no listing.

State (CDFW July 2016, Special Animals List, Available: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406)

E = listed as endangered under the California Endangered Species Act.
T = listed as threatened under the California Endangered Species Act.
SC = listed as a candidate species. A candidate species is one that the California Fish and Game Commission has formally declared a candidate species.
SSC = listed as a California special of special concern by the California Department of Fish and Wildlife
FP = listed as a fully protected by the California Department of Fish and Wildlife
= no listing.

Global Conservation Status (Nature Serve 2015. Available http://explorer.natureserve.org/granks.htm)

G1 = critically imperiled- high risk of extinction due to extreme rarity (often 5 or fewer populations)
G2 = imperiled- high risk of extinction due to very restricted range, very few populations (often 20 or fewer populations)
G3 = vulnerable- moderate risk of extinction due to restricted range and very few populations (often 80 or fewer populations)
G4 = apparently secure- uncommon but not rare
G5 = secure- common, widespread and abundant
G#G# = Range rank; numeric range rank (e.g., G2G3) is used to indicate the range of uncertainty in the status of a species or community.
Q = Questionable taxonomy; taxonomic distinctiveness of this entity at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid.
T# = Infraspecific taxon; the status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank.

Rules for assigning T-ranks follow the same principles outlined above for global conservation.

SWAP State Wildlife Action Plan (CDFW 2015. https://www.wildlife.ca.gov/SWAP/Final)

SGCN- Species of Greatest Conservation Need

CV- Climate Vulnerable

Table E-1b. Wildlife and Fish Species Evaluated for Inclusion as Focal Species in the Santa Clara County RCIS, Step 2

		Criteria					Filtering of Species				
Scientific Name	**Common Name**	**Status**	**Rarity**	**Occur**	**Data**	**Provides Other Conservation Benefit**	**Enough Data Available and Occurs in RCIS Area AND**	**Qualifies as Rare OR**	**Has Special Status OR**	**Provides Additional Conservation Value**	**Meets Screening Criteria**
Adela oplerella	Opler's longhorn moth	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Branchinecta lynchi	Vernal pool fairy shrimp	1	1	0	1	1	FALSE	FALSE	FALSE	FALSE	FALSE
Danaus plexippus	Monarch butterfly	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Euphydryas editha bayensis	Bay checkerspot butterfly	1	1	1	1	1	TRUE	TRUE	TRUE	TRUE	TRUE
Helminthoglypta nickliniana bridgesi	Bridges' Coast Range shoulderband snail	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Hydrochara rickseckeri	Ricksecker's water scavenger beetle	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Hygrotus curvipes	Curved-foot hygrotus diving beetle	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Ischnura gemina	San Francisco forktail damselfly	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE

Scientific Name	Common Name	Criteria: Status	Rarity	Occur	Data	Provides Other Conservation Benefit	Filtering of Species: Enough Data Available and Occurs in RCIS Area AND	Qualifies as Rare OR	Has Special Status OR	Provides Additional Conservation Value	Meets Screening Criteria
Lepidurus packardi	Vernal pool tadpole shrimp	1	1	0	1	0	FALSE	FALSE	FALSE	FALSE	FALSE
Linderiella occidentalis	California fairy shrimp	0	1	0	1	1	FALSE	FALSE	FALSE	FALSE	FALSE
Microcina homi	Hom's microblind harvestman	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Microcina juni	Jung's microblind harvestman	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Nothochrysa californica	San Francisco lacewing	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Speyeria adiaste adiaste	Unsilvered fritillary butterfly	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Speyeria callippe callippe	Callippe silverspot butterfly	1	1	0	1	0	FALSE	FALSE	FALSE	FALSE	FALSE
Speyeria zerene behrensii	Behren's silverspot butterfly	1	1	0	1	0	FALSE	FALSE	FALSE	FALSE	FALSE
Speyeria zerene myrtleae	Myrtle's silverspot butterfly	1	1	0	1	0	FALSE	FALSE	FALSE	FALSE	FALSE
Acipenser medirostris	Green sturgeon	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE

		Criteria					Filtering of Species				
Scientific Name	**Common Name**	**Status**	**Rarity**	**Occur**	**Data**	**Provides Other Conservation Benefit**	**Enough Data Available and Occurs in RCIS Area AND**	**Qualifies as Rare OR**	**Has Special Status OR**	**Provides Additional Conservation Value**	**Meets Screening Criteria**
Archoplites interruptus	Sacramento perch	0	1	0	1	0	FALSE	FALSE	FALSE	FALSE	FALSE
Eucyclogobius newberryi	Tidewater goby	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Hypomesus transpacificus	Delta smelt	1	1	0	1	1	FALSE	FALSE	FALSE	FALSE	FALSE
Lampetra ayresi	River lamprey	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Oncorhynchus kisutch	Coho salmon—central California coast	1	1	0	1	1	FALSE	FALSE	FALSE	FALSE	FALSE
Oncorhynchus mykiss	Central California Coastal steelhead	1	1	1	1	1	TRUE	TRUE	TRUE	TRUE	TRUE
Oncorhynchus mykiss	South-Central California steelhead	1	1	1	1	1	TRUE	TRUE	TRUE	TRUE	TRUE
Oncorhynchus tshawytscha	Central Valley fall/late fall–run Chinook salmon	0	1	1	1	1	TRUE	TRUE	FALSE	TRUE	TRUE
Pogonichthys macrolepidotus	Sacramento splittail	0	1	0	1	0	FALSE	FALSE	FALSE	FALSE	FALSE
Spirinchus thaleichthys	Longfin smelt	1	1	1	1	1	TRUE	TRUE	TRUE	TRUE	TRUE

Scientific Name	Common Name	Criteria: Status	Rarity	Occur	Data	Provides Other Conservation Benefit	Filtering of Species: Enough Data Available and Occurs in RCIS Area AND	Qualifies as Rare OR	Has Special Status OR	Provides Additional Conservation Value	Meets Screening Criteria
Ambystoma californiense	California tiger salamander (Central CA DPS)	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Rana boylii	Foothill yellow-legged frog	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Rana draytonii	California red-legged frog	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Spea hammondii	Western spadefoot toad	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Anniella pulchra pulchra	Silvery legless lizard	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Emys marmorata	Western pond turtle	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Masticophis flagellum ruddocki	San Joaquin coachwhip (=whipsnake)	0	1	0	1	0	FALSE	FALSE	FALSE	FALSE	FALSE
Masticophis lateralis euryxanthus	Alameda whipsnake	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Phrynosoma coronatum frontale	California horned lizard	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE

		Criteria					Filtering of Species				
Scientific Name	**Common Name**	**Status**	**Rarity**	**Occur**	**Data**	**Provides Other Conservation Benefit**	**Enough Data Available and Occurs in RCIS Area AND**	**Qualifies as Rare OR**	**Has Special Status OR**	**Provides Additional Conservation Value**	**Meets Screening Criteria**
Accipiter cooperii	Cooper's hawk	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Accipiter striatus	Sharp-shinned hawk	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Agelaius tricolor	Tricolored blackbird	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Ammodramus savannarum	Grasshopper sparrow	0	1	1	1	1	TRUE	TRUE	FALSE	TRUE	TRUE
Artemisiospizaa belli belli	Bell's sage sparrow	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Aquila chrysaetos	Golden eagle	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Ardea alba	Great Egret	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Ardea herodias	Great blue heron	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Asio flammeus	Short-eared owl	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Athene cunicularia	Burrowing owl	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Botaurus lentiginosus	American bittern	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Branta canadensis leucopareia	Aleutian Canada goose	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Buteo regalis	Ferruginous hawk	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE

Scientific Name	Common Name	Criteria: Status	Rarity	Occur	Data	Provides Other Conservation Benefit	Filtering of Species: Enough Data Available and Occurs in RCIS Area AND	Qualifies as Rare OR	Has Special Status OR	Provides Additional Conservation Value	Meets Screening Criteria
Buteo swainsoni	Swainson's hawk	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Charadrius alexandrinus nivosus	Western snowy plover	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Circus cyaneus	Northern harrier	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Egretta thula	Snowy egret	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Elanus leucurus	White-tailed kite	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Eremophila alpestris actia	California horned lark	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Falco mexicanus	Prairie falcon	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Falco peregrinus anatum	American peregrine falcon	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Geothlypis trichas sinuosa	Saltmarsh common yellowthroat	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Haliaeetus leucocephalus	Bald eagle	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Lanius ludovicianus	Loggerhead shrike	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Laterallus jamaicensis coturniculus	California black rail	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE

Scientific Name	Common Name	Criteria: Status	Rarity	Occur	Data	Provides Other Conservation Benefit	Filtering of Species: Enough Data Available and Occurs in RCIS Area AND	Qualifies as Rare OR	Has Special Status OR	Provides Additional Conservation Value	Meets Screening Criteria
Nycticorax nycticorax	Black-crowned night heron	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Pandion haliaetus	Osprey	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Pelecanus occidentalis californicus	California brown pelican	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Phalacrocorax auritus	Double-crested cormorant	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Progne subis	Purple martin	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Rallus obsoletus obsoletus	Ridgway's rail	1	1	1	1	1	TRUE	TRUE	TRUE	TRUE	TRUE
Riparia riparia	Bank swallow	1	1	0	1	0	FALSE	FALSE	FALSE	FALSE	FALSE
Sterna antillarum (=albifrons) browni	California least tern	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Vireo bellii pusillus	Least Bell's vireo	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Antrozous pallidus	Pallid bat	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Corynorhinus townsendii townsendii	Townsend's big-eared bat	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE

Scientific Name	Common Name	Criteria: Status	Criteria: Rarity	Criteria: Occur	Criteria: Data	Criteria: Provides Other Conservation Benefit	Filtering of Species: Enough Data Available and Occurs in RCIS Area AND	Qualifies as Rare OR	Has Special Status OR	Provides Additional Conservation Value	Meets Screening Criteria
Eumops perotis californicus	Western mastiff-bat	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Lasionycteris noctivagans	Silver-haired bat	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Lasiurus blossevillii	Western red bat	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Lasiurus cinereus	Hoary bat	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Myotis ciliolabrum	Western small-footed myotis	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Myotis evotis	Long-eared myotis	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Myotis thysanodes	Fringed myotis	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Myotis volans	Long-legged myotis	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Myotis yumanensis	Yuma myotis	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Nyctinomops macrotis	Big free-tailed bat	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Puma concolor	Mountain lion	0	0	1	1	1	TRUE	FALSE	FALSE	TRUE	TRUE

		Criteria					Filtering of Species				
Scientific Name	**Common Name**	**Status**	**Rarity**	**Occur**	**Data**	**Provides Other Conservation Benefit**	**Enough Data Available and Occurs in RCIS Area AND**	**Qualifies as Rare OR**	**Has Special Status OR**	**Provides Additional Conservation Value**	**Meets Screening Criteria**
Reithrodontomys raviventris	Salt marsh harvest mouse	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Sorex vagrans halicoetes	Salt marsh wandering shrew	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Taxidea taxus	American badger	0	1	1	1	1	TRUE	TRUE	FALSE	TRUE	TRUE
Vulpes macrotis mutica	San Joaquin kit fox	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE

Criteria

Status = The species is listed by state or federal resource agencies as threatened or endangered or is a candidate for such listing; or the species is reasonably expect to be considered for listing within 10 years of East Bay RCIS approval. This includes species covered by a regional NCCP or HCP that overlaps the RCIS area.

Rarity = The species is recognized by NatureServe as Critically Imperiled (G1) or Imperiled (G2) globally, or is described as a Species of Greatest Conservation Need (SGCN) or Climate Vulnerable (CV) in the State Wildlife Action Plan, or is recognized by CNPS as Rare, Threatened, or Endangered in California and elsewhere (1B) or Rare, Threatened or Endangered in California but is more common elsewhere (2B).

Occur = The species is known or likely to occur in the RCIS area. Occurrence data should be based on credible evidence. Some species may not be present in the RCIS area at the time this RCIS is developed but could have a reasonable expectation to expand their range into the RCIS area within 10 years following RCIS development.

Data = Drawing on best available science and emerging data, sufficient data on the species' life history, habitat requirements, and occurrence in the RCIS area are available to propose viable conservation actions.

0- Does not meet criteria

1- Meets Criteria

Filtering of Species

FALSE- Does not meet criteria

TRUE- Meets Criteria

Table E-1c. Wildlife and Fish Species Evaluated for Inclusion as Focal Species in the Santa Clara County RCIS, Step 3

		Step 3	
Scientific Name	**Common Name**	**Rationale for Exclusion from Focal Species List**	**Included as Focal Species**
Adela oplerella	Opler's longhorn moth	Criteria	No
Branchinecta lynchi	Vernal pool fairy shrimp	Only occurs on Don Edwards NWR, not in RCIS Area	No
Danaus plexippus	Monarch butterfly	Low level of winter roosting; Conservation needs in RCIS Area not well understood	No
Euphydryas editha bayensis	Bay checkerspot butterfly	Completely addressed by SCVHP; not expected to gain additional benefits by inclusion as focal species.	No
Helminthoglypta nickliniana bridgesi	Bridges' Coast Range shoulderband snail	Criteria	No
Hydrochara rickseckeri	Ricksecker's water scavenger beetle	Criteria	No
Hygrotus curvipes	Curved-foot hygrotus diving beetle	Criteria	No
Ischnura gemina	San Francisco forktail damselfly	Criteria	No
Lepidurus packardi	Vernal pool tadpole shrimp	Only occurs on Don Edwards NWR, not in RCIS Area	No
Linderiella occidentalis	California fairy shrimp	Widespread in vernal pool systems, only occurs on Don Edwards NWR, not in RCIS Area	No
Microcina homi	Hom's microblind harvestman	Criteria	No
Microcina juni	Jung's microblind harvestman	Criteria	No
Nothochrysa californica	San Francisco lacewing	Criteria	No
Speyeria adiaste adiaste	Unsilvered fritillary butterfly	Criteria	No
Speyeria callippe callippe	Callippe silverspot butterfly	Criteria	No
Speyeria zerene behrensii	Behren's silverspot butterfly	Criteria	No
Speyeria zerene myrtleae	Myrtle's silverspot butterfly	Criteria	No
Acipenser medirostris	Green sturgeon	Minor portion of range inside RCIS Area, minimal conservation opportunities	No
Archoplites interruptus	Sacramento perch	Criteria	No

		Step 3	
Scientific Name	**Common Name**	**Rationale for Exclusion from Focal Species List**	**Included as Focal Species**
Eucyclogobius newberryi	Tidewater goby	Minor portion of range inside RCIS Area, minimal conservation opportunities	No
Hypomesus transpacificus	Delta smelt	Criteria	No
Lampetra ayresi	River lamprey	Criteria	No
Oncorhynchus kisutch	Coho salmon—central California coast	Minor portion of range inside RCIS Area, minimal conservation opportunities	No
Oncorhynchus mykiss	Central California Coastal steelhead	None	Yes
Oncorhynchus mykiss	South-Central California steelhead	None	Yes
Oncorhynchus tshawytscha	Central Valley fall/late fall–run Chinook salmon	Minor portion of range inside RCIS Area (stray hatchery fish in Guadalupe River), minimal conservation opportunities	No
Pogonichthys macrolepidotus	Sacramento splittail	Criteria	No
Spirinchus thaleichthys	Longfin smelt	Minor portion of range inside RCIS Area, minimal conservation opportunities	No
Ambystoma californiense	California tiger salamander (Central CA DPS)	None	Yes
Rana boylii	Foothill yellow-legged frog	None	Yes
Rana draytonii	California red-legged frog	None	Yes
Spea hammondii	Western spadefoot toad	Criteria	No
Anniella pulchra pulchra	Silvery legless lizard	Criteria	No
Emys marmorata	Western pond turtle	Criteria	No
Masticophis flagellum ruddocki	San Joaquin coachwhip (=whipsnake)	Criteria	No
Masticophis lateralis euryxanthus	Alameda whipsnake	Regulatory status undefined in RCIS Area; minimal threat to species	No
Phrynosoma coronatum frontale	California horned lizard	Criteria	No
Accipiter cooperii	Cooper's hawk	Criteria	No
Accipiter striatus	Sharp-shinned hawk	Criteria	No
Agelaius tricolor	Tricolored blackbird	None	Yes

Scientific Name	Common Name	Step 3 Rationale for Exclusion from Focal Species List	Step 3 Included as Focal Species
Ammodramus savannarum	Grasshopper sparrow	Adequate focus on grassland conservation from other focal species	No
Artemisiospizaa belli belli	Bell's sage sparrow	Criteria	No
Aquila chrysaetos	Golden eagle	Nests at low densities in RCIS Area relative to range; Minimal threat to nest sites	No
Ardea alba	Great Egret	Criteria	No
Ardea herodias	Great blue heron	Criteria	No
Asio flammeus	Short-eared owl	Not well understood in RCIS Area; Adequate focus on grassland conservation from other focal species	No
Athene cunicularia	Burrowing owl	None	Yes
Botaurus lentiginosus	American bittern	Criteria	No
Branta canadensis leucopareia	Aleutian Canada goose	Criteria	No
Buteo regalis	Ferruginous hawk	Criteria	No
Buteo swainsoni	Swainson's hawk	None	Yes
Charadrius alexandrinus nivosus	Western snowy plover	Addressed by Baylands conservation goals and objectives	No
Circus cyaneus	Northern harrier	Criteria	No
Egretta thula	Snowy egret	Criteria	No
Elanus leucurus	White-tailed kite	Low conservation priority in the RCIS Area, Minimal threats to species	No
Eremophila alpestris actia	California horned lark	Criteria	No
Falco mexicanus	Prairie falcon	Criteria	No
Falco peregrinus anatum	American peregrine falcon	Nesting in built environment, minimal conservation opportunities	No
Geothlypis trichas sinuosa	Saltmarsh common yellowthroat	Criteria	No
Haliaeetus leucocephalus	Bald eagle	Occasional nester in RCIS Area; Minimal threat to nest site	No
Lanius ludovicianus	Loggerhead shrike	Adequate focus on grassland and shrubland conservation from other focal species	No
Laterallus jamaicensis coturniculus	California black rail	Addressed by Baylands conservation goals and objectives	No
Nycticorax nycticorax	Black-crowned night heron	Criteria	No

Scientific Name	Common Name	Step 3 Rationale for Exclusion from Focal Species List	Step 3 Included as Focal Species
Pandion haliaetus	Osprey	Criteria	No
Pelecanus occidentalis californicus	California brown pelican	RCIS Area includes small part of non-breeding range; Minimal threat to species or conservation opportunities	No
Phalacrocorax auritus	Double-crested cormorant	Criteria	No
Progne subis	Purple martin	Only known nesting locations on Santa Clara/Santa Cruz county line in Santa Cruz Mtns.	No
Rallus obsoletus obsoletus	Ridgway's rail	Addressed by Baylands conservation goals and objectives	No
Riparia riparia	Bank swallow	Criteria	No
Sterna antillarum (=albifrons) browni	California least tern	RCIS Area includes small part of range; Minimal threat to species or conservation opportunities; Addressed by Baylands conservation goals and objectives	No
Vireo bellii pusillus	Least Bell's vireo	Completely addressed by SCVHP	No
Antrozous pallidus	Pallid bat	Conservation needs not well understood in the RCIS Area	No
Corynorhinus townsendii townsendii	Townsend's big-eared bat	Conservation needs not well understood in the RCIS Area	No
Eumops perotis californicus	Western mastiff-bat	Criteria	No
Lasionycteris noctivagans	Silver-haired bat	Criteria	No
Lasiurus blossevillii	Western red bat	Criteria	No
Lasiurus cinereus	Hoary bat	Criteria	No
Myotis ciliolabrum	Western small-footed myotis	Criteria	No
Myotis evotis	Long-eared myotis	Criteria	No
Myotis thysanodes	Fringed myotis	Conservation needs not well understood in the RCIS Area	No
Myotis volans	Long-legged myotis	Criteria	No
Myotis yumanensis	Yuma myotis	Criteria	No
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	Criteria	No
Nyctinomops macrotis	Big free-tailed bat	Criteria	No
Puma concolor	Mountain lion	None	Yes
Reithrodontomys raviventris	Salt marsh harvest mouse	Addressed by Baylands conservation goals and objectives	No
Sorex vagrans halicoetes	Salt marsh wandering shrew	Criteria	No

Scientific Name	Common Name	Step 3 Rationale for Exclusion from Focal Species List	Step 3 Included as Focal Species
Taxidea taxus	American badger	Addressed by mountain lion conservation goals and objectives	No
Vulpes macrotis mutica	San Joaquin kit fox	None	Yes

Table E-1d. Wildlife and Fish Species Evaluated for Inclusion as Focal Species in the Santa Clara County RCIS, Additional Information

Scientific Name	Common Name	Additional Information
Adela oplerella	Opler's longhorn moth	14 CNDDB occurrences, 8 between 1991 and 2006. Occurrences in Santa Clara, Sonoma Santa Cruz, San Francisco, and Marin Counties. Most of the current occurrences are located in Santa Clara county. Larvae feed on Platystemon californicus.
Branchinecta lynchi	Vernal pool fairy shrimp	Covered ECCC; addressed by EACCS
Danaus plexippus	Monarch butterfly	378 CNDDB occurrences along the coast from Baja to Mendocino.
Euphydryas editha bayensis	Bay checkerspot butterfly	Covered by SCVHP.
Helminthoglypta nickliniana bridgesi	Bridges' Coast Range shoulderband snail	Species' ecology is not well understood, one CNDDB occurrence.
Hydrochara rickseckeri	Ricksecker's water scavenger beetle	Little is known about species' habitat.
Hygrotus curvipes	Curved-foot hygrotus diving beetle	Little is known about species' habitat.
Ischnura gemina	San Francisco forktail damselfly	Very localized in urban areas; endemic to wetlands in the San Francisco Bay Area.
Lepidurus packardi	Vernal pool tadpole shrimp	Covered by ECCC.
Linderiella occidentalis	California fairy shrimp	CNDDB occurrences throughout Sacramento Valley and central California in hardpan or sandstone depressions.
Microcina homi	Hom's microblind harvestman	5 CNDDB occurrences, 4 from 1966, one from 1983. All are vague and non-specific.
Microcina juni	Jung's microblind harvestman	1 CNDDB occurrence in Santa Clara county. This occurrence and very vague and provide very few occurrences details. Accuracy for the occurrence is 1/10th of a mile.
Nothochrysa californica	San Francisco lacewing	Little information is available on species.
Speyeria adiaste adiaste	Unsilvered fritillary butterfly	Little information available on the species, uncertain if it occurs in the RCIS Area.
Speyeria callippe callippe	Callippe silverspot butterfly	Covered by ECCC.
Speyeria zerene behrensii	Behren's silverspot butterfly	Few occurrences in coastal Sonoma County.
Speyeria zerene myrtleae	Myrtle's silverspot butterfly	Many occurrences in Marin and Sonoma Counties.
Acipenser medirostris	Green sturgeon	The distinct population segment that occurs in the study area spawns primarily in the mainstem of the Sacramento River.

Scientific Name	Common Name	Additional Information
Archoplites interruptus	Sacramento perch	Moves through Bay on way to spawning habitat; spawns in Abbotts Lagoon within the protected Point Reyes National Seashore in Marin.
Eucyclogobius newberryi	Tidewater goby	Many occurrences in Marin, San Mateo, and Sonoma Counties.
Hypomesus transpacificus	Delta smelt	Many occurrences in Contra Costa and Solano Counties.
Lampetra ayresi	River lamprey	Insufficient data to create conservation strategy.
Oncorhynchus kisutch	Coho salmon—central California coast	Occurrences in Marin and Sonoma Counties.
Oncorhynchus mykiss	Central California Coastal steelhead	Occurs in Alameda, Marin, Napa, San Mateo, Santa Clara and Sonoma Counties. Addressed by EACCS.
Oncorhynchus mykiss	South-Central California steelhead	Potential habitat in southern Santa Clara.
Oncorhynchus tshawytscha	Central Valley fall/late fall–run Chinook salmon	Moves through Bay on way to spawning habitat.
Pogonichthys macrolepidotus	Sacramento splittail	Many Occurrences in Solano and Sonoma Counties.
Spirinchus thaleichthys	Longfin smelt	Occurrences in Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma Counties.
Ambystoma californiense	California tiger salamander (Central CA DPS)	Covered by ECCC and SCVHP. Addressed by EACCS.
Rana boylii	Foothill yellow-legged frog	Covered by ECCC and SCVHP. Addressed by EACCS.
Rana draytonii	California red-legged frog	Covered by ECCC and SCVHP. Addressed by EACCS.
Spea hammondii	Western spadefoot toad	Not in RCIS Area. Range is Sacramento- San Joaquin valley and southern California.
Anniella pulchra pulchra	Silvery legless lizard	Covered by ECCC.
Emys marmorata	Western pond turtle	Covered by ECCC and SCVHP. 1159 CNDDB occurrences. Aquatic habitat generalist.
Masticophis flagellum ruddocki	San Joaquin coachwhip (=whipsnake)	Majority of range is not within the RCIS Area.
Masticophis lateralis euryxanthus	Alameda whipsnake	Covered by ECCC and addressed by EACCS.
Phrynosoma coronatum frontale	California horned lizard	The taxonomy of this species is uncertain.
Accipiter cooperii	Cooper's hawk	Widespread forest generalist. Populations have increased by >200% between 1970 and 2014.
Accipiter striatus	Sharp-shinned hawk	Widespread forest generalist. Populations have increased by 68% between 1970 and 2014.

Scientific Name	Common Name	Additional Information
Agelaius tricolor	Tricolored blackbird	Covered by ECCC and SCVHP and addressed by EACCS. Greater than 50% of population lost between 1970 and 2014. High vulnerability due to small population and range.
Ammodramus savannarum	Grasshopper sparrow	Uncommon in the study area.
Artemisiospizaa belli belli	Bell's sage sparrow	Not listed; listing unlikely.
Aquila chrysaetos	Golden eagle	Covered by ECCC and addressed by EACCS. Habitat generalist in western U.S./Mexico. Area-dependent species.
Ardea alba	Great Egret	Widely distributed egret common in the study area.
Ardea herodias	Great blue heron	Widely distributed, common in the study area.
Asio flammeus	Short-eared owl	Uncommon species in the study area.
Athene cunicularia	Burrowing owl	Covered by EACCS, ECCC, and SCVHP.
Botaurus lentiginosus	American bittern	Widespread species common in the study area.
Branta canadensis leucopareia	Aleutian Canada goose	Widespread species that occurs in San Mateo County
Buteo regalis	Ferruginous hawk	Species found in Western U.S./Mexico. Breeds in grassland habitat outside study area. Populations have increased by 39% between 1970 and 2014, with a population estimate of 110,000.
Buteo swainsoni	Swainson's hawk	Covered by ECCC, recent occurrences in Santa Clara County.
Charadrius alexandrinus nivosus	Western snowy plover	Many occurrences in Alameda, Marin, Napa San Mateo, Contra Costa, and Santa Clara. Limited to coastal beach and salt ponds. Threatened by development and human recreation.
Circus cyaneus	Northern harrier	Breeds throughout California. Nests in tidal, brackish and freshwater marshes, and other wet, vegetated areas.
Egretta thula	Snowy egret	Common species in the study area.
Elanus leucurus	White-tailed kite	Many occurrences in Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, Solano, and Sonoma Counties.
Eremophila alpestris actia	California horned lark	Wide range in coastal regions from Sonoma County to San Diego County, as well as main part of San Joaquin Valley and east to foothills.
Falco mexicanus	Prairie falcon	Common in California, 458 CNDDB occurrences.
Falco peregrinus anatum	American peregrine falcon	Not enough regular nesting occurrences in Bay Area. This species has been federally delisted due to recovery.
Geothlypis trichas sinuosa	Saltmarsh common yellowthroat	Locally numerous in areas where extensive wetlands with adjacent riparian thickets remain.
Haliaeetus leucocephalus	Bald eagle	Not enough regular nesting occurrences in Bay Area. This species has been federally delisted due to recovery.
Lanius ludovicianus	Loggerhead shrike	Significant declines (74%) of population between 1970 and 2014. Occurs in grasslands in Alameda and Contra Costa County. Primarily overwinters in RCIS Area
Laterallus jamaicensis coturniculus	California black rail	Many occurrences in Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, Solano, and Sonoma Counties.

Scientific Name	Common Name	Additional Information
Nycticorax nycticorax	Black-crowned night heron	Common species in the study area.
Pandion haliaetus	Osprey	Population has increased by more than 200% between 1970 and 2014.
Pelecanus occidentalis californicus	California brown pelican	This species has been federally delisted due to recovery; common and widespread in the study area.
Phalacrocorax auritus	Double-crested cormorant	Common species in the study area.
Progne subis	Purple martin	Uncommon breeder; in the study area, nests local on the coastal ridges of Marin County and isolated locations in the Santa Cruz Mountains.
Rallus obsoletus obsoletus	Ridgway's rail	Many occurrences in saltmarsh habitat around the Bay fringe.
Riparia riparia	Bank swallow	Only one known colony in Bay Area at Fort Funston National Park, S.F.
Sterna antillarum (=albifrons) browni	California least tern	Many occurrences in Alameda, Contra Costa, San Mateo, Santa Clara, and Solano Counties.
Vireo bellii pusillus	Least Bell's vireo	Limited occurrences in Santa Clara County in past 20 years. Covered by SCVHP. Mitigation may not be necessary if species does not occur in RCIS Area.
Antrozous pallidus	Pallid bat	Locally common species in low elevation of California. 405 CNDDB occurrences.
Corynorhinus townsendii townsendii	Townsend's big-eared bat	Covered by ECCC but not enough data to create a mitigation strategy.
Eumops perotis californicus	Western mastiff-bat	Uncommon resident in southeastern San Joaquin Valley and Coastal Ranges from Monterey Co. southward through southern California.
Lasionycteris noctivagans	Silver-haired bat	Very uncommon in the study area, Of 138 CNDDB occurrences, one in Alameda County in 1920.
Lasiurus blossevillii	Western red bat	Uncommon in the study area. Winter range includes western lowlands and coastal regions south of San Francisco Bay.
Lasiurus cinereus	Hoary bat	The most widespread bat in North America. Found throughout California.
Myotis ciliolabrum	Western small-footed myotis	Common bat of arid upland in California. No CNDDB occurrences in the study area.
Myotis evotis	Long-eared myotis	Widespread but uncommon in its range. Occurs along the entire coast in a variety of wooded habitat. No CNDDB occurrences in the study area.
Myotis thysanodes	Fringed myotis	Widespread in California, occurring in all but the Central Valley and Colorado and Mojave deserts. 3 CNDDB occurrences in Sonoma County.
Myotis volans	Long-legged myotis	Common in California occurring in the coastal ranges from Oregon to Mexico. Most common in woodland and forests habitat above 4000 feet.

Scientific Name	Common Name	Additional Information
Myotis yumanensis	Yuma myotis	Common and widespread in California. Uncommon in the Mojave and Colorado desert regions. Uncommon above 8000 feet.
Neotoma fuscipes annectens	San Francisco dusky-footed woodrat	Subspecies status is unresolved.
Nyctinomops macrotis	Big free-tailed bat	Low-lying arid areas in southern California.
Puma concolor	Mountain lion	Good indicator of habitat connectivity; area-dependent species.
Reithrodontomys raviventris	Salt marsh harvest mouse	Many occurrences in Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, Solano, Sonoma Counties.
Sorex vagrans halicoetes	Salt marsh wandering shrew	Little data available on the life history of this species. The current distribution and status in unknown.
Taxidea taxus	American badger	Addressed by EACCS.
Vulpes macrotis mutica	San Joaquin kit fox	Covered by ECCC and SCVHP. Addressed by EACCS.

Table E-2a. Plant Species Evaluated for Inclusion as Focal Species in the Santa Clara County RCIS, Step 1

		Status				
Scientific Name	**Common Name**	**Federal**	**State**	**Global**	**CRPR**	**SWAP Status**
Acanthomintha lanceolata	Santa Clara thornmint	–	–	G4	4.2	N
Allium peninsulare var. franciscanum	Franciscan onion	–	–	G5T1	1B.2	N
Allium sharsmithae	Sharsmith's onion	–	–	G2	1B.3	N
Amsinckia lunaris	Bent-flowered fiddleneck	–	–	G2?	1B.2	N
Androsace elongata subsp. acuta	California androsace	–	–	G5?T3T4	4.2	N
Arctostaphylos andersonii	Santa Cruz manzanita	–	–	G2	1B.2	N
Azolla mexicana	Mexican mosquito fern	–	–	G5	4.2	N
Balsamorhiza macrolepis var. macrolepis	Big-scale balsamroot	–	–	G2	1B.2	N
Calandrinia breweri	Brewer's calandrinia	–	–	G4	4.2	N
California macrophylla	Round-leaved filaree	–	–	G2	–	Y
Calochortus umbellatus	Oakland star-tulip	–	–	G4	4.2	N
Calyptridium parryi var. hesseae	Santa Cruz Mountain pussypaws	–	–	G3G4T2	1B.1	N
Campanula exigua	Chaparral harebell	–	–	G2	1B.2	N
Campanula sharsmithiae	Mt. Hamilton harebell	–	–	G1	1B.2	N
Castilleja affinis subsp. neglecta	Tiburon paintbrush = Tiburon Indian paintbrush	E	T	G4G5T1	1B.2	Y
Ceanothus ferrisae	Coyote ceanothus	E	–	G2	1B.1	Y
Centromadia parryi subsp. congdonii	Congdon's spikeweed	–	–	G3T2	1B.2	Y
Chloropyron maritimus subsp. palustris	Point Reyes bird's-beak	–	–	G4?T2	1B.2	N
Cirsium fontinale var. campylon	Mt. Hamilton thistle	–	–	G2T2	1B.2	N
Clarkia breweri	Brewer's clarkia	–	–	G4	4.2	N
Clarkia concinna subsp. automixa	Santa Clara red-ribbons	–	–	G5?T3	4.3	N

Scientific Name	Common Name	Status				
		Federal	State	Global	CRPR	SWAP Status
Collinsia multicolor	San Francisco collinsia	–	–	G2	1B.2	N
Delphinium californicum subsp. interius	Hospital Canyon larkspur	–	–	G3T3	1B.2	N
Dirca occidentalis	Western leatherwood	–	–	G2	1B.2	N
Dudleya abramsii subsp. setchellii	Santa Clara Valley dudleya	E	–	G2	1B.1	Y
Eriastrum tracyi	Tracy's eriastrum	–	R	G3Q	1B.2	N
Eriogonum argillosum	Clay-loving buckwheat	–	–	G3	4.3	N
Eriogonum umbellatum var. bahiiforme	Bay buckwheat	–	–	G5T3	4.2	N
Eriophyllum jepsonii	Jepson's woolly sunflower	–	–	G3	4.3	N
Eryngium aristulatum var. hooveri	Hoover's button-celery	–		G5T1	1B.1	N
Erysimum franciscanum	San Francisco wallflower	–	–	G3	4.2	N
Extriplex joaquiniana	San Joaquin spearscale = San Joaquin saltbush	–	–	G2	1B.2	N
Fritillaria agrestis	Stinkbells	–	–	G3	4.2	N
Fritillaria falcata	Talus fritillary	–	–	G2	1B.2	N
Fritillaria liliacea	Fragrant fritillary	–	–	G2	1B.2	N
Galium andrewsii subsp. gatense	Serpentine bedstraw	–	–	G5T3	4.2	N
Hoita strobilina	Loma Prieta hoita	–	–	G2	1B.1	Y
Isocoma menziesii var. diabolica	Satan's goldenbush	–	–	G3G5T3	4.2	N
Lasthenia conjugens	Contra Costa goldfields	E	–	G1	1B.1	Y
Legenere limosa	Legenere	–	–	G2	1B.1	N
Leptosyne hamiltonii	Mt. Hamilton coreopsis	–	–	G2	1B.2	N
Leptosiphon acicularis	Bristly leptosiphon	–	–	G3	4.2	N
Leptosiphon ambiguus	Serpentine linanthus	–	–	G4	4.2	N
Leptosiphon grandiflorus	Large-flowered linanthus	–	–	G3	4.2	N

		Status				
Scientific Name	**Common Name**	**Federal**	**State**	**Global**	**CRPR**	**SWAP Status**
Lessingia hololeuca	Wooly-headed lessingia	–	–	G3?	3	N
Lessingia micradenia var. glabrata	Smooth lessingia	–	–	G2T2	1B.2	N
Lessingia tenuis	Spring lessingia	–	–	G4	4.3	N
Lomatium observatorium	Mt. Hamilton lomatium	–	–	G1	1B.2	N
Lomatium parvifolium	Small-leaved lomatium	–	–	G4	4.2	N
Madia radiata	Showy madia	–	–	G2	1B.1	Y
Malacothamnus arcuatus	Arcuate bush mallow	–	–	G2Q	1B.2	N
Malacothamnus hallii	Hall's bush mallow	–	–	G2	1B.2	N
Meconella oregana	Oregon meconella	–	–	G2G3	1B.1	N
Micropus amphibolus	Mt. Diablo cottonweed	–	–	G3G4	3.2	N
Microseris sylvatica	Sylvan microseris	–	–	G4	4.2	N
Monardella antonina subsp. antonina	San Antonio Hills monardella	–	–	G4T1T3Q	3	N
Monolopia gracilens	woodland woollythreads	–	–	G3	1B.2	N
Myosurus minimus subsp. apus	Little mousetails	–	–	G5T2Q	3.1	N
Navarretia cotulifolia	Cotula navarretia	–	–	G4	4.2	N
Navarretia prostrata	Prostrate navarretia	–	–	G2	1B.1	N
Perideridia gairdneri subsp. gairdneri	Gairdner's yampah	–	–	G5T4	4.2	N
Phacelia phacelioides	Mt. Diablo phacelia	–	–	G2	1B.2	N
Pinus radiata	Monterey pine	–	–	G1	1B.1	N
Piperia leptopetala	Narrow-petaled rein orchid	–	–	G4	4.3	N
Piperia michaelii	Michael's rein orchid	–	–	G3	4.2	N
Plagiobothrys chorisianus var. hickmanii	Hickman's popcornflower	–	–	G3T3Q	4.2	N
Plagiobothrys verrucosus	Forget-me-not popcornflower	–	–	G4?	2B.1	N
Psilocarphus brevissimus var. multiflorus	Delta wooly-marbles	–	–	G4T3	4.2	N
Ranunculus lobbii	Lobb's aquatic buttercup	–	–	G4	4.2	N

		Status				
Scientific Name	**Common Name**	**Federal**	**State**	**Global**	**CRPR**	**SWAP Status**
Ribes victoris	Victor's gooseberry	–	–	G4	4.3	N
Sanicula saxatilis	Rock sanicle	–	R	G2	1B.2	N
Senecio aphanactis	Chaparral ragwort	–	–	G3	2B.2	N
Sidalcea malachroides	Maple-leaved checkerbloom	–	–	G3	4.2	N
Streptanthus albidus subsp. peramoenus	Most beautiful jewelflower	–	–	G2T2	1B.2	N
Streptanthus glandulosus subsp. albidus	Metcalf Canyon jewleflower	–	–	G2T2	1B.1	Y
Streptanthus callistus	Mt. Hamilton jewelflower	–	–	G1G2	1B.3	N
Suaeda californica	California seablight	E	–	G1	1B.1	N
Trifolium amoenum	Showy Indian clover	E	–	G1	1B.1	N
Trifolium hydrophilum	Saline clover	–	–	G2	1B.2	N

Status

Federal

E = listed as endangered under the federal Endangered Species Act.

= no listing.

State

T = listed as threatened under the California Endangered Species Act.

R = listed as rare under the California Endangered Species Act.

= no listing.

Global (NatureServe 2015. Available http://explorer.natureserve.org/granks.htm)

G1 = Critically imperiled; at very high risk for extinction.

G2 = Imperiled; at high risk for extinction.

G3 = Vulnerable; at moderate risk for extinction.

G4 = Apparently secure; uncommon but not rare.

G5 = Secure; common, widespread and abundant.

G#G# = Range rank; numeric range rank (e.g., G2G3) is used to indicate the range of uncertainty in the status of a species or community.

T# = Infraspecific Taxon; the status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank.

Rules for assigning T-ranks follow the same principles outlined above for global conservation status ranks. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1.

California Rare Plant Rank (CRPR) (California Native Plant Society 2016. Available http://www.cnps.org/cnps/rareplants/ranking.php)

1B = plants rare, threatened or endangered in California and elsewhere.

0.1- = seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)

0.2- = moderately threatened in California (20-80% of occurrences threatened/moderate degree of immediacy of threat)

SWAP State Wildlife Action Plan (CDFW 2015. https://www.wildlife.ca.gov/SWAP/Final)

Table E-2b. Plant Species Evaluated for Inclusion as Focal Species in the Santa Clara County RCIS, Step 2

		Criteria					Filtering of Species				
Scientific Name	**Common Name**	**Status**	**Rarity**	**Occur**	**Data**	**Provides Other Conservation Benefit**	**Enough Data Available and Occurs in RCIS Area AND**	**Qualifies as Rare OR**	**Has Special Status OR**	**Provides Additional Conservation Value**	**Meets Screening Criteria**
Acanthomintha lanceolata	Santa Clara thornmint	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Allium peninsulare var. franciscanum	Franciscan onion	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Allium sharsmithae	Sharsmith's onion	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Amsinckia lunaris	Bent-flowered fiddleneck	0	1	0	1	0	FALSE	FALSE	FALSE	FALSE	FALSE
Androsace elongata subsp. acuta	California androsace	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Arctostaphylos andersonii	Santa Cruz manzanita	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Azolla mexicana	Mexican mosquito fern	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Balsamorhiza macrolepis var. macrolepis	Big-scale balsamroot	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Calandrinia breweri	Brewer's calandrinia	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
California macrophylla	Round-leaved filaree	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Calochortus umbellatus	Oakland star-tulip	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE

		Criteria					Filtering of Species				
Scientific Name	**Common Name**	**Status**	**Rarity**	**Occur**	**Data**	**Provides Other Conservation Benefit**	**Enough Data Available and Occurs in RCIS Area AND**	**Qualifies as Rare OR**	**Has Special Status OR**	**Provides Additional Conservation Value**	**Meets Screening Criteria**
Calyptridium parryi var. hesseae	Santa Cruz Mountain pussypaws	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Campanula exigua	Chaparral harebell	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Campanula sharsmithiae	Mt. Hamilton harebell	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Castilleja affinis subsp. neglecta	Tiburon paintbrush = Tiburon Indian paintbrush	1	1	1	1	1	TRUE	TRUE	TRUE	TRUE	TRUE
Ceanothus ferrisae	Coyote ceanothus	1	1	1	1	1	TRUE	TRUE	TRUE	TRUE	TRUE
Centromadia parryi subsp. congdonii	Congdon's spikeweed	0	1	1	1	1	TRUE	TRUE	FALSE	TRUE	TRUE
Chloropyron maritimus subsp. palustris	Point Reyes bird's-beak	0	1	0	1	0	FALSE	FALSE	FALSE	FALSE	FALSE
Cirsium fontinale var. campylon	Mt. Hamilton thistle	1	1	1	1	1	TRUE	TRUE	TRUE	TRUE	TRUE
Clarkia breweri	Brewer's clarkia	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Clarkia concinna subsp. automixa	Santa Clara red-ribbons	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE

		Criteria					Filtering of Species				
Scientific Name	**Common Name**	**Status**	**Rarity**	**Occur**	**Data**	**Provides Other Conservation Benefit**	**Enough Data Available and Occurs in RCIS Area AND**	**Qualifies as Rare OR**	**Has Special Status OR**	**Provides Additional Conservation Value**	**Meets Screening Criteria**
Collinsia multicolor	San Francisco collinsia	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Delphinium californicum subsp. interius	Hospital Canyon larkspur	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Dirca occidentalis	Western leatherwood	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Dudleya abramsii subsp. setchellii	Santa Clara Valley dudleya	1	1	1	1	1	TRUE	TRUE	TRUE	TRUE	TRUE
Eriastrum tracyi	Tracy's eriastrum	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Eriogonum argillosum	Clay-loving buckwheat	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Eriogonum umbellatum var. bahiiforme	Bay buckwheat	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Eriophyllum jepsonii	Jepson's woolly sunflower	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Eryngium aristulatum var. hooveri	Hoover's button-celery	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Erysimum franciscanum	San Francisco wallflower	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE

		Criteria					Filtering of Species				
Scientific Name	**Common Name**	**Status**	**Rarity**	**Occur**	**Data**	**Provides Other Conservation Benefit**	**Enough Data Available and Occurs in RCIS Area AND**	**Qualifies as Rare OR**	**Has Special Status OR**	**Provides Additional Conservation Value**	**Meets Screening Criteria**
Extriplex joaquiniana	San Joaquin spearscale = San Joaquin saltbush	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Fritillaria agrestis	Stinkbells	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Fritillaria falcata	Talus fritillary	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Fritillaria liliacea	Fragrant fritillary	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Galium andrewsii subsp. gatense	Serpentine bedstraw	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Hoita strobilina	Loma Prieta hoita	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Isocoma menziesii var. diabolica	Satan's goldenbush	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Lasthenia conjugens	Contra Costa goldfields	1	1	0	1	0	FALSE	FALSE	FALSE	FALSE	FALSE
Legenere limosa	Legenere	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Leptosyne hamiltonii	Mt. Hamilton coreopsis	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Leptosiphon acicularis	Bristly leptosiphon	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Leptosiphon ambiguus	Serpentine linanthus	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE

		Criteria					Filtering of Species				
Scientific Name	**Common Name**	**Status**	**Rarity**	**Occur**	**Data**	**Provides Other Conservation Benefit**	**Enough Data Available and Occurs in RCIS Area AND**	**Qualifies as Rare OR**	**Has Special Status OR**	**Provides Additional Conservation Value**	**Meets Screening Criteria**
Leptosiphon grandiflorus	Large-flowered linanthus	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Lessingia hololeuca	Wooly-headed lessingia	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Lessingia micradenia var. glabrata	Smooth lessingia	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Lessingia tenuis	Spring lessingia	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Lomatium observatorium	Mt. Hamilton lomatium	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Lomatium parvifolium	Small-leaved lomatium	0	0	1	1	0	TRUE	FALSE	FALSE	FALSE	FALSE
Madia radiata	Showy madia	1	1	0	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Malacothamnus arcuatus	Arcuate bush mallow	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Malacothamnus hallii	Hall’s bush mallow	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Meconella oregana	Oregon meconella	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Micropus amphibolus	Mt. Diablo cottonweed	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Microseris sylvatica	Sylvan microseris	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Monardella antonina subsp. antonina	San Antonio Hills monardella	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE

		Criteria					Filtering of Species				
Scientific Name	**Common Name**	**Status**	**Rarity**	**Occur**	**Data**	**Provides Other Conservation Benefit**	**Enough Data Available and Occurs in RCIS Area AND**	**Qualifies as Rare OR**	**Has Special Status OR**	**Provides Additional Conservation Value**	**Meets Screening Criteria**
Monolopia gracilens	woodland woollythreads	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Myosurus minimus subsp. apus	Little mousetails	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Navarretia cotulifolia	Cotula navarretia	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Navarretia prostrata	Prostrate navarretia	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Perideridia gairdneri subsp. gairdneri	Gairdner's yampah	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Phacelia phacelioides	Mt. Diablo phacelia	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Pinus radiata	Monterey pine	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Piperia leptopetala	Narrow-petaled rein orchid	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Piperia michaelii	Michael's rein orchid	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Plagiobothrys chorisianus var. hickmanii	Hickman's popcornflower	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Plagiobothrys verrucosus	Forget-me-not popcornflower	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Psilocarphus brevissimus var. multiflorus	Delta wooly-marbles	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE

		Criteria					Filtering of Species				
Scientific Name	**Common Name**	**Status**	**Rarity**	**Occur**	**Data**	**Provides Other Conservation Benefit**	**Enough Data Available and Occurs in RCIS Area AND**	**Qualifies as Rare OR**	**Has Special Status OR**	**Provides Additional Conservation Value**	**Meets Screening Criteria**
Ranunculus lobbii	Lobb's aquatic buttercup	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Ribes victoris	Victor's gooseberry	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Sanicula saxatilis	Rock sanicle	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Senecio aphanactis	Chaparral ragwort	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Sidalcea malachroides	Maple-leaved checkerbloom	0	0	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Streptanthus albidus subsp. peramoenus	Most beautiful jewelflower	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Streptanthus glandulosus subsp. albidus	Metcalf Canyon jewleflower	1	1	1	1	0	TRUE	TRUE	TRUE	FALSE	TRUE
Streptanthus callistus	Mt. Hamilton jewelflower	0	1	1	1	0	TRUE	TRUE	FALSE	FALSE	TRUE
Suaeda californica	California seablight	1	1	0	1	0	FALSE	FALSE	FALSE	FALSE	FALSE
Trifolium amoenum	Showy Indian clover	1	1	0	0	0	FALSE	FALSE	FALSE	FALSE	FALSE
Trifolium hydrophilum	Saline clover	0	1	1	0	0	FALSE	FALSE	FALSE	FALSE	FALSE

Criteria

Status = The species is listed by state or federal resource agencies as threatened or endangered, or is a candidate for such listing; or the species is reasonably expect to be considered for listing within 10 years of East Bay RCIS approval. This includes species covered by a regional NCCP or HCP that overlaps the RCIS area.

Rarity = The species is recognized by NatureServe as Critically Imperiled (G1) or Imperiled (G2) globally, or is described as a Species of Greatest Conservation Need (SGCN) or Climate Vulnerable (CV) in the State Wildlife Action Plan, or is recognized by CNPS as Rare, Threatened, or Endangered in California and elsewhere (1B) or Rare, Threatened or Endangered in California but is more common elsewhere (2B).

Occur = The species is known or likely to occur in the RCIS area. Occurrence data should be based on credible evidence. Some species may not be present in the RCIS area at the time this RCIS is developed but could have a reasonable expectation to expand their range into the RCIS area within 10 years following RCIS development.

Data = Drawing on best available science and emerging data, sufficient data on the species' life history, habitat requirements, and occurrence in the RCIS area are available to propose viable conservation actions.

0- Does not meet criteria

1- Meets Criteria

Filtering of Species

FALSE- Does not meet criteria

TRUE- Meets Criteria

Table E-2c. Plant Species Evaluated for Inclusion as Focal Species in the Santa Clara County RCIS, Step 3

Scientific Name	Common Name	Rationale for Exclusion from Focal Species List	Included as Focal Species
Acanthomintha lanceolata	Santa Clara thornmint	Criteria	No
Allium peninsulare var. franciscanum	Franciscan onion	Criteria	No
Allium sharsmithae	Sharsmith's onion	Will not need mitigation	No
Amsinckia lunaris	Bent-flowered fiddleneck	Criteria	No
Androsace elongata subsp. acuta	California androsace	Criteria	No
Arctostaphylos andersonii	Santa Cruz manzanita	All but one occurrence in the study area on protected land	No
Azolla mexicana	Mexican mosquito fern	Criteria	No
Balsamorhiza macrolepis var. macrolepis	Big-scale balsamroot	2 occurrences in RCIS Area, one on protected land. Adequate focus on grassland and shrubland conservation from other focal species	No
Calandrinia breweri	Brewer's calandrinia	Criteria	No
California macrophylla	Round-leaved filaree	Criteria	No
Calochortus umbellatus	Oakland star-tulip	Criteria	No
Calyptridium parryi var. hesseae	Santa Cruz Mountain pussypaws	Criteria	No
Campanula exigua	Chaparral harebell	Will not need mitigation	No
Campanula sharsmithiae	Mt. Hamilton harebell	Criteria	No
Castilleja affinis subsp. neglecta	Tiburon paintbrush = Tiburon Indian paintbrush	Completely with SCVHP	No
Ceanothus ferrisae	Coyote ceanothus	Completely with SCVHP	No
Centromadia parryi subsp. congdonii	Congdon's spikeweed	N/A	Yes
Chloropyron maritimus subsp. palustris	Point Reyes bird's-beak	Criteria	No
Cirsium fontinale var. campylon	Mt. Hamilton thistle	N/A	Yes
Clarkia breweri	Brewer's clarkia	Criteria	No
Clarkia concinna subsp. automixa	Santa Clara red-ribbons	Criteria	No
Collinsia multicolor	San Francisco collinsia	On protected land, will not need mitigation	No
Delphinium californicum subsp. interius	Hospital Canyon larkspur	Will not need mitigation	No
Dirca occidentalis	Western leatherwood	Criteria	No

Scientific Name	Common Name	Rationale for Exclusion from Focal Species List	Included as Focal Species
Dudleya abramsii subsp. setchellii	Santa Clara Valley dudleya	Completely with SCVHP	No
Eriastrum tracyi	Tracy's eriastrum	N/A	Yes
Eriogonum argillosum	Clay-loving buckwheat	Criteria	No
Eriogonum umbellatum var. bahiiforme	Bay buckwheat	Criteria	No
Eriophyllum jepsonii	Jepson's woolly sunflower	Criteria	No
Eryngium aristulatum var. hooveri	Hoover's button-celery	Criteria	No
Erysimum franciscanum	San Francisco wallflower	Criteria	No
Extriplex joaquiniana	San Joaquin spearscale = San Joaquin saltbush	Will not need mitigation	No
Fritillaria agrestis	Stinkbells	Criteria	No
Fritillaria falcata	Talus fritillary	Criteria	No
Fritillaria liliacea	Fragrant fritillary	N/A	Yes
Galium andrewsii subsp. gatense	Serpentine bedstraw	Criteria	No
Hoita strobilina	Loma Prieta hoita	N/A	yes
Isocoma menziesii var. diabolica	Satan's goldenbush	Criteria	No
Lasthenia conjugens	Contra Costa goldfields	Criteria	No
Legenere limosa	Legenere	One occurrence in RCIS Area on protected land	No
Leptosyne hamiltonii	Mt. Hamilton coreopsis	Will not need mitigation	No
Leptosiphon acicularis	Bristly leptosiphon	Criteria	No
Leptosiphon ambiguus	Serpentine linanthus	Criteria	No
Leptosiphon grandiflorus	Large-flowered linanthus	Criteria	No
Lessingia hololeuca	Wooly-headed lessingia	Criteria	No
Lessingia micradenia var. glabrata	Smooth lessingia	N/A	Yes
Lessingia tenuis	Spring lessingia	Criteria	No
Lomatium observatorium	Mt. Hamilton lomatium	Will not need mitigation	No
Lomatium parvifolium	Small-leaved lomatium	Criteria	No
Madia radiata	Showy madia	Criteria	No
Malacothamnus arcuatus	Arcuate bush mallow	Criteria	No
Malacothamnus hallii	Hall's bush mallow	Most occurrences are on protected land, will not need mitigation	No
Meconella oregana	Oregon meconella	Will not need mitigation	No

Scientific Name	Common Name	Rationale for Exclusion from Focal Species List	Included as Focal Species
Micropus amphibolus	Mt. Diablo cottonweed	Criteria	No
Microseris sylvatica	Sylvan microseris	Criteria	No
Monardella antonina subsp. antonina	San Antonio Hills monardella	Criteria	No
Monolopia gracilens	woodland woollythreads	Will not need mitigation	No
Myosurus minimus subsp. apus	Little mousetails	Criteria	No
Navarretia cotulifolia	Cotula navarretia	Criteria	No
Navarretia prostrata	Prostrate navarretia	Will not need mitigation	No
Perideridia gairdneri subsp. gairdneri	Gairdner's yampah	Criteria	No
Phacelia phacelioides	Mt. Diablo phacelia	Will not need mitigation	No
Pinus radiata	Monterey pine	Criteria	No
Piperia leptopetala	Narrow-petaled rein orchid	Criteria	No
Piperia michaelii	Michael's rein orchid	Criteria	No
Plagiobothrys chorisianus var. hickmanii	Hickman's popcornflower	Criteria	No
Plagiobothrys verrucosus	Forget-me-not popcornflower	Criteria	No
Psilocarphus brevissimus var. multiflorus	Delta wooly-marbles	Criteria	No
Ranunculus lobbii	Lobb's aquatic buttercup	Criteria	No
Ribes victoris	Victor's gooseberry	Criteria	No
Sanicula saxatilis	Rock sanicle	N/A	Yes
Senecio aphanactis	Chaparral ragwort	Criteria	No
Sidalcea malachroides	Maple-leaved checkerbloom	Criteria	No
Streptanthus albidus subsp. peramoenus	Most beautiful jewelflower	N/A	Yes
Streptanthus glandulosus subsp. albidus	Metcalf Canyon jewleflower	Completely with SCVHCP	No
Streptanthus callistus	Mt. Hamilton jewelflower	Will not need mitigation	No
Suaeda californica	California seablight	Criteria	No
Trifolium amoenum	Showy Indian clover	Criteria	No
Trifolium hydrophilum	Saline clover	Criteria	No

Table E-2d. Plant Species Evaluated for Inclusion as Focal Species in the Santa Clara County RCIS, Additional Information

Scientific Name	Common Name	Additional Information
Acanthomintha lanceolata	Santa Clara thornmint	Species has limited distribution throughout California but not restricted to the RCIS Area.
Allium peninsulare var. franciscanum	Franciscan onion	22 CNDDB occurrences recorded in Mendocino, Sonoma, San Mateo, and Santa Clara Counties. 6 extant occurrences located on protected lands in San Mateo and Sonoma Counties. Affinity to serpentine soil.
Allium sharsmithae	Sharsmith's onion	7 CNDDB occurrences in Alameda and Santa Clara Counties. Affinity to serpentine soil.
Amsinckia lunaris	Bent-flowered fiddleneck	Most CNDDB occurrences are vague and need additional fieldwork. Insufficient information to create conservation strategy.
Androsace elongata subsp. acuta	California androsace	Species has limited distribution throughout California but is not restricted to the RCIS Area.
Arctostaphylos andersonii	Santa Cruz manzanita	23 CNDDB occurrences recorded from San Mateo and Santa Clara Counties.
Azolla mexicana	Mexican mosquito fern	Species has limited distribution throughout California but not restricted to the RCIS Area.
Balsamorhiza macrolepis var. macrolepis	Big-scale balsamroot	12 CNDDB occurrences in Alameda, Napa, Santa Clara, Solano, and Sonoma Counties. 5 extant occurrences in Alameda, Santa Clara, Solano, and Sonoma Counties.
Calandrinia breweri	Brewer's calandrinia	Species has limited distribution throughout California, but not restricted to the RCIS Area.
California macrophylla	Round-leaved filaree	Covered by ECCC
Calochortus umbellatus	Oakland star-tulip	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Calyptridium parryi var. hesseae	Santa Cruz Mountain pussypaws	13 CNDDB occurrences in Monterey, San Luis Obispo, Santa Clara, and Santa Cruz Counties. Locational data are vague for the 3 occurrences in Santa Clara County.
Campanula exigua	Chaparral harebell	17 CNDDB occurrences in Alameda, Contra Costa, and Santa Clara Counties.
Campanula sharsmithiae	Mt. Hamilton harebell	7 CNDDB occurrences in Santa Clara and Stanislaus Counties. Data on the Santa Clara County occurrences are vague.
Castilleja affinis subsp. neglecta	Tiburon paintbrush = Tiburon Indian paintbrush	Nine occurrences in the RCIS Area, covered by SCVHCP.
Ceanothus ferrisae	Coyote ceanothus	Four occurrences in Santa Clara County, covered by SCVHCP.
Centromadia parryi subsp. congdonii	Congdon's spikeweed	Addressed by EACCS.
Chloropyron maritimus subsp. palustris	Point Reyes bird's-beak	68 CNDDB occurrences in Alameda, Humboldt, Marin, San Francisco, San Mateo, Santa Clara, and Sonoma Counties. The majority of CNDDB occurrences in the RCIS Area are on protected land.

Scientific Name	**Common Name**	**Additional Information**
Cirsium fontinale var. campylon	Mt. Hamilton thistle	Covered by SCVHCP.
Clarkia breweri	Brewer's clarkia	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Clarkia concinna subsp. automixa	Santa Clara red-ribbons	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Collinsia multicolor	San Francisco collinsia	3 extant occurrences recently observed (within last 12 years), one each in San Mateo, San Francisco, and Santa Clara Counties on protected land.
Delphinium californicum subsp. interius	Hospital Canyon larkspur	22 CNDDB occurrences in Alameda, Contra Costa, and Santa Clara Counties. 2 extant occurrences in Santa Clara County on private land. 10 extant occurrences on protected land in Alameda and Contra Costa Counties.
Dirca occidentalis	Western leatherwood	Widespread in the RCIS Area, 65 CNDDB occurrences in Alameda, Contra Costa, Marin, San Mateo, Santa Clara, and Sonoma Counties; the majority of which have insufficient information.
Dudleya abramsii subsp. setchellii	Santa Clara Valley dudleya	209 occurrences in Santa Clara County; covered by SCVHCP
Eriastrum tracyi	Tracy's eriastrum	90 occurrences, many outside of the RCIS Area. Species occurs in Santa Clara county in the RCIS Area.
Eriogonum argillosum	Clay-loving buckwheat	Species has limited distribution throughout California, but not restricted to the RCIS Area
Eriogonum umbellatum var. bahiiforme	Bay buckwheat	Species has limited distribution throughout California, but not restricted to the RCIS Area
Eriophyllum jepsonii	Jepson's woolly sunflower	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Eryngium aristulatum var. hooveri	Hoover's button-celery	CNDDB occurrences in Alameda, Santa Clara counties and San Benito County within the Santa Clara RCIS boundary.
Erysimum franciscanum	San Francisco wallflower	Species has limited distribution throughout California, but not restricted to RCIS Area.
Extriplex joaquiniana	San Joaquin spearscale = San Joaquin saltbush	Only one occurrence at San Felipe lake in San Benito County
Fritillaria agrestis	Stinkbells	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Fritillaria falcata	Talus fritillary	8 CNDDB occurrences in Alameda and Santa Clara Counties.
Fritillaria liliacea	Fragrant fritillary	77 occurrences in CNDDB, covered by SCVHCP.
Galium andrewsii subsp. gatense	Serpentine bedstraw	Species has limited distribution throughout California but not restricted to the RCIS Area.
Hoita strobilina	Loma Prieta hoita	Covered by SCVHCP.
Isocoma menziesii var. diabolica	Satan's goldenbush	Species has limited distribution throughout California, but not restricted to the RCIS Area
Lasthenia conjugens	Contra Costa goldfields	Current occurrences throughout the RCIS Area.

Scientific Name	Common Name	Additional Information
Legenere limosa	Legenere	17 CNDDB occurrences in Alameda, Napa, San Mateo, Santa Clara, and Solano Counties, the majority of which are on protected land.
Leptosyne hamiltonii	Mt. Hamilton coreopsis	2 CNDDB occurrences in Alameda County and 18 in Santa Clara County.
Leptosiphon acicularis	Bristly leptosiphon	Species has limited distribution throughout California, but not restricted to the RCIS Area
Leptosiphon ambiguus	Serpentine linanthus	Species has limited distribution throughout California, but not restricted to the RCIS Area
Leptosiphon grandiflorus	Large-flowered linanthus	Species has limited distribution throughout California, but not restricted to the RCIS Area
Lessingia hololeuca	Wooly-headed lessingia	Insufficient information- taxonomically problematic.
Lessingia micradenia var. glabrata	Smooth lessingia	Covered by SCVHCP.
Lessingia tenuis	Spring lessingia	Species has limited distribution throughout California, but not restricted to the RCIS Area
Lomatium observatorium	Mt. Hamilton lomatium	4 CNDDB occurrences in Santa Clara and Stanislaus counties.
Lomatium parvifolium	Small-leaved lomatium	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Madia radiata	Showy madia	Covered by ECCC.
Malacothamnus arcuatus	Arcuate bush mallow	30 CNDDB occurrences, mainly in Santa Clara and San Mateo Counties. Species taxonomy is uncertain.
Malacothamnus hallii	Hall's bush mallow	29 CNDDB occurrences mainly in Santa Clara and Contra Costa Counties.
Meconella oregana	Oregon meconella	9 CNDDB occurrences in Contra Costa, Monterey, San Luis Obispo and Santa Clara Counties. Candidate for listing in Oregon and threatened in Washington.
Micropus amphibolus	Mt. Diablo cottonweed	Insufficient information- taxonomically problematic.
Microseris sylvatica	Sylvan microseris	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Monardella antonina subsp. antonina	San Antonio Hills monardella	Insufficient information- taxonomically problematic.
Monolopia gracilens	woodland woollythreads	CNDDB occurrences in Alameda, Contra Costa, San Mateo, and Santa Clara Counties.
Myosurus minimus subsp. apus	Little mousetails	Insufficient information- taxonomically problematic.
Navarretia cotulifolia	Cotula navarretia	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Navarretia prostrata	Prostrate navarretia	Only one occurrence at San Felipe lake in San Benito County
Perideridia gairdneri subsp. gairdneri	Gairdner's yampah	Species has limited distribution throughout California but, not restricted to the RCIS Area.
Phacelia phacelioides	Mt. Diablo phacelia	13 CNDDB occurrences mainly in Contra Costa, Santa Clara, and Stanislaus Counties.

Scientific Name	Common Name	Additional Information
Pinus radiata	Monterey pine	Common introduced species in the RCIS Area. Native stands do not occur in the RCIS Area.
Piperia leptopetala	Narrow-petaled rein orchid	Species has limited distribution throughout California, but not restricted to the RCIS Area
Piperia michaelii	Michael's rein orchid	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Plagiobothrys chorisianus var. hickmanii	Hickman's popcornflower	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Plagiobothrys verrucosus	Forget-me-not popcornflower	4 CNDDB occurrences in Santa Clara County.
Psilocarphus brevissimus var. multiflorus	Delta wooly-marbles	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Ranunculus lobbii	Lobb's aquatic buttercup	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Ribes victoris	Victor's gooseberry	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Sanicula saxatilis	Rock sanicle	Seven occurrences in Santa Clara and Contra Costa Counties, all but one located on UC or State Park property.
Senecio aphanactis	Chaparral ragwort	Most CNDDB occurrences in southern California. Occurrences in the RCIS Area are poor and outdated.
Sidalcea malachroides	Maple-leaved checkerbloom	Species has limited distribution throughout California, but not restricted to the RCIS Area.
Streptanthus albidus subsp. peramoenus	Most beautiful jewelflower	Covered by SCVHCP.
Streptanthus glandulosus subsp. albidus	Metcalf Canyon jewleflower	Covered by SCVHCP.
Streptanthus callistus	Mt. Hamilton jewelflower	Four occurrences in Santa Clara County.
Suaeda californica	California seablight	All RCIS Area occurrences are transplants, numerous occurrences in San Luis Obispo County
Trifolium amoenum	Showy Indian clover	26 occurrences in RCIS Area, all of which are historic except for one.
Trifolium hydrophilum	Saline clover	Endemic to central coastal California in Alameda, Contra Costa, Colusa , Lake, Monterey, Napa, Sacramento, San Benito, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, San Mateo, Solano, Sonoma, and Yolo counties. 32 CNDDB occurrences in the RCIS Area.

Appendix F
Non-focal Species Summaries

Appendix F
Non-focal Species Summaries

This appendix briefly describes the habitat requirements of the Santa Clara County Regional Conservation Investment Strategy (RCIS) non-focal species and explains the ecological rationale behind the association of each non-focal species with focal species so that Mitigation Credit Agreement (MCA) credits may be created for non-focal species. A non-focal species is eligible for consideration of mitigation credits in an MCA if the non-focal species can be associated with a focal species or other conservation element. According to the California Department of Fish and Wildlife's RCIS Program Guidelines (2018), to demonstrate associations, "the RCIS must include a brief, science-based justification indicating how the non-focal species' ecological requirements align with those of a focal species or another conservation element, and how the actions for the associated focal species or other conservation element would benefit the non-focal species."

The Santa Clara County RCIS Steering Committee selected 8 species to be included as non-focal species in this RCIS based on the potential need for mitigation credits for these species. Non-focal species include the following.

- Longfin smelt (*Spirinchus thaleichthys*)
- Western pond turtle (*Emys marmorata*)
- Western snowy plover (*Charadrius alexandrinus nivosus*)
- Ridgway's rail (*Rallus obsoletus obsoletus*)
- American badger (*Taxidea taxus*)
- Townsend's big eared bat (*Corynorhinus townsendii*)
- Salt marsh harvest mouse (*Reithrodontomys raviventris*)
- Hoover's button celery (*Eryngium aristulatum* var. *hooveri*)

Many non-focal species have conservation needs similar to the focal species, which would be addressed by implementing conservation actions and habitat enhancement actions for focal species that use the same habitats. Similarly, many non-focal species will benefit from the implementation of conservation actions and habitat enhancement actions for the other conservation elements (e.g., habitat connectivity, working lands, serpentine soils, and unique land cover types; Chapter 3, *Conservation Strategy*, Section 3.7, *Conservation Strategy for Other Conservation Elements*). For example, non-focal species that have habitat requirements that overlap with the habitat requirements of focal species will benefit from conservation actions and habitat enhancement actions that protect, enhance, and restore habitat for focal species and other conservation elements such as habitat connectivity. The following sections briefly describe the habitat requirements of the non-focal species and explain the ecological rationale behind the association of each non-focal species with conservation actions for focal species and other conservation elements.

At the end of this appendix are two sets of tables that show which non-focal species may benefit from conservation actions and habitat enhancement actions implemented for focal species and unique land cover types in the RCIS area. Tables F-1a and F-1b show the general habitat relationships between non-focal species and this RCIS's land cover types (unique land cover types are identified with an asterisk) (Chapter 2, *Environmental Setting*, Section 2.2.4.2, *Natural Communities and Land Cover*). Table F-1 is split in two parts, because the tables are too wide (i.e., have too many columns) to present in their entirety in a single table.

Table F-2 highlights the general similarities in habitat use and overlap between non-focal species and focal species, identified by similarities in affinities for land cover types. Land cover is the basis for the focal species habitat models (Chapter 2, Section 2.2.5.2, *Habitat Distribution Models*) and the conservation strategy (Chapter 3) and can be used as a common currency when considering how conservation goals, objectives, actions, and priorities for focal species will also benefit non-focal species. As such, this RCIS contemplates the conservation needs of the focal species and non-focal species with similar habitat needs.

Tables F-1a and F-1b, and F-2 are not intended to precisely depict non-focal species' habitat relationships or overlap in habitat use between non-focal and focal species. These tables are only intended to illustrate the general relationships between non-focal species, land cover types, and focal species to show how implementation of this RCIS's conservation actions and habitat enhancement actions could benefit non-focal species. An organism's habitat is influenced by factors other than land cover, such as microclimate, current and historic land use (e.g., livestock grazing), presence and abundance of predators and competitors, among others, such that not all land cover would be expected to be suitable. Also, most species do not completely overlap habitat usage with other species.

This appendix can be used as a tool for MCA sponsors to identify non-focal species for which credits can be created if present on an MCA site. For example, using the information provided in this appendix, MCA sponsors could survey for non-focal species that could be present on a site. Credits could be created for that non-focal species if conservation actions or habitat enhancement actions that contribute towards achieving this RCIS's conservation goals and objectives are implemented through the MCA. Conservation actions would include permanently protecting or restoring, and perpetually managing, habitat for non-focal species in ways that would help achieve one or more conservation objective of this Santa Clara County RCIS. Habitat enhancement actions would be management actions that improve habitat quality to help achieve one or more conservation objective of this Santa Clara County RCIS. Habitat enhancement actions would have long-term durability but would not involve acquiring land or permanently protecting habitat (Appendix A, *Glossary*).

Non-focal Species Summaries

Longfin Smelt

Longfin smelt is found in the San Francisco Bay and the Sacramento/San Joaquin Delta (Bay-Delta), and uses a variety of habitats from nearshore waters, to estuaries and lower portions of freshwater streams (U.S. Fish and Wildlife Service 2012, Garwood 2017, Grimaldo et al. 2017), sharing many general ecological requirements and habitats with the focal fish species – Central California Coast Steelhead and South Central California Coast Steelhead – in the baylands. In the Bay-Delta, longfin smelt occur in open water away from the bottom of the water column and away from shore. Juveniles and adults can be found throughout the year in water with a broad range of salinities from freshwater to seawater (U.S. Fish and Wildlife Service 2012). The conservation strategy for the focal fish species prioritizes actions on streams labeled as estuarine on Figure H-1, Appendix H, in the San Francisco Bay CPU to protect, enhance, and restore important bayland habitat for steelhead (Chapter 3, *Conservation Strategy*, Section 3.6.1.2, *Conservation Priorities*) (National Marine Fisheries Service 2016). Implementation of actions in these estuaries may benefit longfin smelt where they co-occur with the focal fish species. Longfin smelt may also benefit from implementation of actions ULCT-5, ULCT-6, ULCT-7, and ULCT-8 to achieve Objective 20-2 to protect and manage bayland habitats for the benefits of rare, threatened, and endangered species (Section 3.7.4, *Unique Land Cover Types*). If implemented, these actions would protect and restore tidal marsh and subtidal habitat.

Western Pond Turtle

Western pond turtle is associated with permanent or nearly permanent water in a wide variety of habitats with ample basking sites (Thomson et al. 2016). Upland habitats are also important to western pond turtle for nesting, overwintering, and overland dispersal (Holland 1994, Ernest et al. 2009, Thomson et al. 2016), with nesting sites as far as 1,312 feet (400 meters) or more from aquatic habitat (Slavens 1995, Thomson et al. 2016). A variety of vegetation types above the normal high water mark can be used for overwintering sites where there is access to open solar radiation including shrubby, open habitats such as chaparral and coastal sage scrub, as well as hardwood- and conifer-dominated forested environments (Rathbun et al. 1992, Holland 1994, Reese and Welsh 1997, Rathbun et al. 2002, Rosenberg et al. 2009, Pilliod et al. 2013, Thomson et al. 2016). Turtles typically burrow into duff (leaf litter) or loose soil, where they remain during the winter months (Holland 1994, Thomson et al. 2016). Western pond turtle shares many habitat associations with focal species that also require aquatic habitat, including Central California Coast steelhead, South Central California Coast steelhead, California tiger salamander, foothill yellow-legged frog, California red-legged frog, and tricolored blackbird. Upland habitat suitable for California tiger salamander, California red-legged frog, tricolored blackbird, burrowing owl, and other focal species may also be suitable for western pond turtle if it is near occupied aquatic habitat. Therefore, conservation actions or habitat enhancement actions that protect or enhance aquatic habitat may benefit western pond turtle if the aquatic habitat includes basking sites and sufficient protected adjacent upland habitat, ideally with connectivity to other aquatic habitat. Conservation actions or habitat enhancement actions that protect or enhance a variety of upland habitats including grassland, chaparral, and woodland may benefit western pond turtle if the actions improve habitat that is within an appropriate distance of suitable aquatic habitat.

Western Snowy Plover

In the RCIS area, western snowy plover primarily uses salt pannes, salt ponds, and adjacent levees for nesting, as well as tidal flats for foraging (Page et al. 2009). These habitats are found in the baylands, including the tidal bay flat and tidal unnatural land cover types (Table F-1b). Driftwood, kelp, and other debris provide cover for chicks that crouch near objects to hide from predators. Invertebrates are often found near debris, so driftwood and kelp are also important for harboring western snowy plover food sources (Page et al. 2009). This RCIS does not include focal species that use similar habitats to western snowy plover. However, the conservation strategy for unique land cover types (Chapter 3, *Conservation Strategy*, Section 3.7.4, *Unique Land Cover Types*) includes Objective 20-2 to protect and manage bayland habitats for the benefit of rare, threatened, and endangered species. Implementing actions to achieve Objective 20-2 could also benefit western snowy plover when implemented in western snowy plover habitats. For example, Action ULCT-8 could be implemented to enhance and protect salt ponds and other barren or sparsely vegetated areas used by western snowy plover for nesting. Action UCLT-9 could be implemented in ways that protect nesting western snowy plover eggs and chicks from predators such as by erecting seasonal habitat fencing or nest exclosures.

California Black Rail

California black rail inhabits saltwater, brackish, and freshwater marshes (Grinnell and Miller 1944, Manolis 1978, Spautz et al. 2005). In the RCIS area they are only known to occur in tidal marsh habitat in the baylands, characterized by the tidal vegetation land cover type (Table F-1b). California black rail in the San Francisco Bay Area tends to prefer tidal salt marshes dominated by dense pickleweed (*Salicornia pacifica*) with an open structure below (Tsao et al. 2009). California black rail tends to be associated with areas where *Schoenoplectus* (formerly *Scirpus*) spp. and *Salicornia* border each other (Evens et al. 1991). This RCIS does not include focal species that use similar habitats to California black rail. However, the conservation strategy for unique land cover types (Chapter 3, *Conservation Strategy*, Section 3.7.4, *Unique Land Cover Types*) includes an objective (Objective 20-2) to protect and manage bayland habitats for the benefit of rare, threatened, and endangered species. Implementing actions to achieve Objective 20-2 could also benefit California black rail when implemented in California black rail habitats. For example, Actions ULCT-5 and ULCT-6 could be implemented to protect, enhance, and restore tidal marshes that provide habitat for California black rail. Action ULCT-9 could be implemented to widen buffers between tidal marshes and adjacent development to reduce edge effects such as disturbance and influx of predators from adjacent developed areas.

Ridgeway's Rail

Ridgway's rail occurs within a range of saltwater and brackish marshes. This species can inhabit salt marshes dominated by pickleweed and Pacific cordgrass (*Spartina foliosa*) in the middle marsh zone. Ridgway's rail also lives in tidal brackish marshes that vary significantly in vegetation structure and composition (U.S. Fish and Wildlife Service 1998, U.S. Fish and Wildlife Service 2013a). These habitats are found in the baylands, including the tidal bay flat and tidal unnatural land cover types (Table F-1b). This RCIS does not include focal species that use similar habitats to Ridgeway's rail. However, the conservation strategy for unique land cover types (Chapter 3, *Conservation Strategy*, Section 3.7.4, *Unique Land Cover Types*) includes an objective (Objective 20-2) to protect and manage bayland habitats for the benefit of rare, threatened, and endangered species. Implementing actions to achieve Objective 20-2 could also benefit Ridgeway's rail when implemented in Ridgeway's rail habitats. For example, Actions ULCT-5 and ULCT-6 could be implemented to protect, enhance, and restore tidal marshes that provide habitat for Ridgeway's rail. Action ULCT-9 could be implemented to widen buffers between tidal marshes and adjacent development to reduce edge effects such as disturbance and influx of predators from adjacent developed areas.

Townsend's Big-eared Bat

Townsend's big-eared bat selects roost sites with specific and predictable characteristics (Sherwin et al. 2000), including limestone caves, mines, lava tubes, and buildings as well as basal hollows in large redwoods (Dalquest, 1947, Pearson et al. 1952, Graham 1966, Kunz and Martin 1982, Pierson 1988, Dobkin et al. 1995, Sherwin et al. 2000, Fellers and Pierson 2002, Mazurek 2004, Gervais

2017, Western Working Bat Group 2017). This species is most commonly associated a diversity of forest types including ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*), mixed conifer and hardwood forest, oak woodlands (*Quercus* spp.), and redwoods (*Sequoia sempervirens*) (Dalquest, 1947, Pearson et al. 1952, Graham 1966, Kunz and Martin 1982, Pierson 1988, Dobkin et al. 1995, Pierson et al. 1999, Sherwin et al. 2000, Mazurek 2004, Gervais 2017, Western Working Bat Group 2017). Townsend's big-eared bat is also found in chaparral, sagebrush (*Artemesia* spp.), and desert scrub (Pierson et al. 1999). Townsend's big eared bats forage in these forested and more open habitats, as well as along riparian forest corridors (Pierson 1998, Fellers and Pierson 2002). Townsend's big-eared bat rely on open surface water for hydration, and in more arid locations water availability can become limiting (Gervais 2017). Tables F-1a and F-1b show the corresponding range of land cover types in the Santa Clara County RCIS area within which Townsend's big-eared bat are associated. These land cover types may provide habitat for several of the focal species in the RCIS area such as California tiger salamander, California red-legged frog, Swainson's hawk, tricolored blackbird, and burrowing owl (Table F-2). Implementation of actions that protect habitat for these focal species may also benefit Townsend's big-eared bat, particularly if protected habitat includes suitable roost sites, foraging habitat, and available open water (Taylor and Tuttle 2012).

Salt Marsh Harvest Mouse

Salt marsh harvest mouse occurs in tidal marsh habitat around the San Francisco Bay, which generally corresponds to the Santa Clara County RCIS's tidal bay flat and tidal vegetation land cover types. This species depends on dense cover of native halophytes (salt-tolerant plants). Deep (approximately 23 to 30 inches) and dense pickleweed, intermixed with fat-hen (*Atriplex prostrata* or *A. patula*) and alkali heath (*Frankenia salina*), is preferred in many areas (U.S. Fish and Wildlife Service 2013). Salt marsh harvest mouse also occurs in dense stands of three-square bulrush (*Schoenoplectus americanus*) (Shellhammer 1989, U.S. Fish and Wildlife Service 2013b), as well as other kinds of dense halophytic vegetation. Salt marsh harvest mice will move to adjoining grasslands during the highest winter tides and will occasionally use grasslands during spring and summer, when new growth affords sufficient cover (Fisler 1965, Shellhammer et al. 1982). This RCIS does not include focal species that use similar habitats to salt marsh harvest mouse (Table F-2). However, the conservation strategy for unique land cover types (Chapter 3, *Conservation Strategy*, Section 3.7.4, *Unique Land Cover Types*) includes Objective 20-2 to protect and manage bayland habitats for the benefit of rare, threatened, and endangered species. Implementing actions to achieve Objective 20-2 could also benefit salt marsh harvest mouse when implemented in salt marsh harvest mouse habitats. For example, Actions ULCT-5 and ULCT-6 could be implemented to protect, enhance, and restore tidal marshes that provide habitat for salt marsh harvest mouse. Action ULCT-9 could be implemented to widen buffers between tidal marshes and adjacent development to reduce edge effects such as disturbance and influx of predators from adjacent developed areas. Grassland buffers could also provide refuge during high winter tides .

American Badger

American badger is found in open, arid landscapes with vegetation that can range from open canopy forest to grassland (Zeiner et al. 1988). In the San Francisco Bay Area American badger is found primarily within grassland. To the south of the RCIS area in the Fort Ord National Monument in Monterey, California the top three habitat preferences within American badger's home range were found to be annual grassland, coastal sage scrub, and urban (Quinn 2007). Friable soils are an important habitat feature, particularly to capture fossorial rodents and to excavate dens. American badger may be associated with grassland and scrub land cover types, including California annual grassland, serpentine grassland, and northern coastal scrub/Diablan sage scrub land cover types (Tables F-1a and F-1b). Given the extensive distribution of grassland in the RCIS area (Section 2.2.4.2., *Natural Communities and Land Cover*), American badger shares habitat associations with the many focal species that are associated with grassland habitats (Table F-2). Actions for the associated focal species in Table F-2 that protect or enhance California annual grassland, serpentine grassland, and northern coastal scrub/Diablan sage scrub may benefit the American badger by protecting suitable habitat. For example, California tiger salamander relies on ground squirrel burrows for refuge in grassland habitats. Implementation of Action CTS-2 would protect grasslands with populations of ground squirrels that may provide suitable American badger habitat with friable soils and abundant prey. Implementation of Action CTS-3 would enhance grasslands by applying land management practices that benefit fossorial mammals such as ground squirrels.

Hoover's Button Celery

Hoover's button celery is an annual or perennial native herb that occurs in vernal pools, seasonal wetlands, occasionally alkaline, and other ephemeral wetland habitats, (Sheikh 1983, Baldwin et al. 2012, Calflora 2018, California Native Plant Society 2018,). Hoover's button celery may be associated with the seasonal wetland land cover type (Table F-2). Hoover's button celery shares habitat associations with focal species that are associated with seasonal wetlands such as California tiger salamander and California red-legged frog (Table F-2). Conservation actions or habitat enhancement actions implemented to protect, enhance, or restore seasonal aquatic habitats used by California tiger salamander or California red-legged frog may benefit Hoover's button celery if abiotic and biotic conditions are suitable.

Table F-1a. Associations between Non-focal Species and Land Cover Types[a,b]

Common Name *Scientific Name*	California annual grassland	Serpentine Grassland[c]	Serpentine rock outcrop[c]	Barren/Rock	Northern mixed chaparral/chamise chaparral	Serpentine chaparral[c]	Northern coastal scrub/Diablan sage scrub[c]	Blue oak woodland	Valley oak forest and woodland[c]	Coast live oak forest and woodland	Mixed oak woodland and forest	Montane hardwood[c]	Serpentine hardwood[c]	Douglas fir forest[c]	Serpentine conifer[c]	Coulter pine forest[c]	Knobcone pine forest[c]	Ponderosa pine woodland	Redwood forest[c]
	Land Cover Type																		
Fish																			
Longfin smelt *Spirinchus thaleichthys*																			
Reptile																			
Western pond turtle *Emys marmorata*	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Birds																			
Western snowy plover *Charadrius alexandrinus nivosus*																			
California black rail *Laterallus jamaicensis coturniculus*																			
Ridgway's rail *Rallus obsoletus obsoletus*																			
Mammals																			
Townsend's big-eared bat *Corynorhinus townsendii townsendii*				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Salt marsh harvest mouse *Reithrodontomys raviventris*																			
American badger *Taxidea taxus*	X	X					X												

Common Name *Scientific Name*	Land Cover Type																		
	California annual grassland	**Serpentine Grassland[c]**	**Serpentine rock outcrop[c]**	**Barren/Rock**	**Northern mixed chaparral/chamise chaparral**	**Serpentine chaparral[c]**	**Northern coastal scrub/Diablan sage scrub[c]**	**Blue oak woodland**	**Valley oak forest and woodland[c]**	**Coast live oak forest and woodland**	**Mixed oak woodland and forest**	**Montane hardwood[c]**	**Serpentine hardwood[c]**	**Douglas fir forest[c]**	**Serpentine conifer[c]**	**Coulter pine forest[c]**	**Knobcone pine forest[c]**	**Ponderosa pine woodland**	**Redwood forest[c]**
Plant																			
Hoover's button-celery *Eryngium aristulatum* var. *hooveri*																			

[a] Table F-1 is split in two parts (F-1a and F-1b). The species identified in each row in Table F-1a are repeated in Table F-1b.

[b] This table shows the general land cover types utilized by non-focal species. Other factors such as microclimate and proximity to water can influence whether habitat within a mapped land cover is suitable such that this table does not precisely depict the species' -habitat relationships.

[c] Identified as a rare/unique land cover type in the RCIS area (Chapter 2, *Environmental Setting*, Section 2.3.3, *Unique Land Cover Types*).

Table F-1b. Associations between Non-focal Species and Land Cover Types[a,b]

Common Name *Scientific Name*	Land Cover Type																				
	Central coast riparian forest[c]	Sycamore alluvial woodland[c]	Serpentine riparian[c]	Shallow bay	Tidal bay flat[c]	Tidal unnatural	Tidal vegetation	Perennial freshwater marsh[c]	Seasonal wetland[c]	Spring/seep (non-serpentine)[c]	Spring/seep (serpentine)[c]	Pond[c]	Reservoir	Cultivated-undetermined	Developed agriculture	Grain, row-crops, disked	Orchard	Vineyard	Urban	Rural residential	Ornamental woodland
Fish																					
Longfin smelt *Spirinchus thaleichthys*				X	X	X	X														
Reptile																					
Western pond turtle *Emys marmorata*	X	X	X					X	X			X	X								
Birds																					
Western snowy plover *Charadrius alexandrinus nivosus*					X	X															
California black rail *Laterallus jamaicensis coturniculus*							X														
Ridgway's rail *Rallus obsoletus obsoletus*					X		X														
Mammals																					
Townsend's big-eared bat *Corynorhinus townsendii townsendii*	X	X	X									X	X								
Salt marsh harvest mouse *Reithrodontomys raviventris*					X		X														
American badger *Taxidea taxus*																					

Common Name *Scientific Name*	Land Cover Type																				
	Central coast riparian forest[c]	Sycamore alluvial woodland[c]	Serpentine riparian[c]	Shallow bay	Tidal bay flat[c]	Tidal unnatural	Tidal vegetation	Perennial freshwater marsh[c]	Seasonal wetland[c]	Spring/seep (non-serpentine)[c]	Spring/seep (serpentine)[c]	Pond[c]	Reservoir	Cultivated-undetermined	Developed agriculture	Grain, row-crops, disked	Orchard	Vineyard	Urban	Rural residential	Ornamental woodland
Plant																					
Hoover's button-celery *Eryngium aristulatum* var. *hooveri*									X												

[a] Table F-1 is split in two parts (F-1a and F-1b). The species identified in each row in Table F-1a are repeated in Table F-1b.

[b] This table shows the general land cover types utilized by non-focal species. Other factors such as microclimate and proximity to water can influence whether habitat within a mapped land cover is suitable such that this table does not precisely depict the species' -habitat relationships.

c Identified as a rare/unique land cover type in the RCIS area (Chapter 2, *Environmental Setting*, Section 2.3.3, *Unique Land Cover Types*).

Table F-2. Associations between Non-Focal Species and Focal Species

	Focal Species																		
Common Name ***Scientific Name***	**Central California Coast steelhead**	**South Central California Coast steelhead**	**California tiger salamander**	**Foothill yellow-legged frog**	**California red-legged frog**	**Tricolored blackbird**	**Burrowing owl**	**Swainson's hawk**	**San Joaquin kit fox**	**Mountain lion**	**Congdon's spikeweed**	**Mount Hamilton thistle**	**Tracy's eriastrum**	**Fragrant fritillary**	**Loma Prieta hoita**	**Smooth lessingia**	**Rock sanicle**	**Most beautiful jewelflower**	
Fish																			
Longfin smelt *Spirinchus thaleichthys*	X	X																	
Reptiles																			
Western pond turtle *Emys marmorata*	X	X	X	X	X	X	X	X											
Birds																			
Western snowy plover* *Charadrius alexandrinus nivosus*																			
California black rail* *Laterallus jamaicensis coturniculus*																			
Ridgway's rail* *Rallus obsoletus obsoletus*																			
Mammals																			
Townsend's big-eared bat *Corynorhinus townsendii townsendii*			X		X	X	X	X	X				X				X		
Salt marsh harvest mouse* *Reithrodontomys raviventris*																			
American badger *Taxidea taxus*			X		X	X	X	X	X	X	X		X	X	X			X	

Common Name *Scientific Name*	Focal Species																		
	Central California Coast steelhead	**South Central California Coast steelhead**	**California tiger salamander**	**Foothill yellow-legged frog**	**California red-legged frog**	**Tricolored blackbird**	**Burrowing owl**	**Swainson's hawk**	**San Joaquin kit fox**	**Mountain lion**	**Congdon's spikeweed**	**Mount Hamilton thistle**	**Tracy's eriastrum**	**Fragrant fritillary**	**Loma Prieta hoita**	**Smooth lessingia**	**Rock sanicle**	**Most beautiful jewelflower**	
Plant																			
Hoover's button-celery *Eryngium aristulatum* var. *hooveri*			X		X														

a This table shows general similarities in habitat use in the RCIS area between non-focal species and focal species, identified by similarities in use of land cover types. Most species do not completely overlap habitat usage with other species. Furthermore, most species select habitat at finer scales than generalized here. As such, these tables do not precisely depict the overlap in habitat use between non-focal and focal species.

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Appendix G
Comparison of RCIS Species Habitat Models and Habitat Plan Habitat Models

Appendix G
Comparison of RCIS Species Habitat Models and Habitat Plan Habitat Models

This Santa Clara County Regional Conservation Investment Strategy's (RCIS) habitat models were developed to be consistent with the habitat models developed for the Santa Clara Valley Habitat Plan's (Habitat Plan) (ICF International 2012) covered species. This RCIS's habitat models differ in land cover types used to represent habitat where there are differences between the land cover data (and names of land cover types) used by this RCIS and the Habitat Plan. Other differences reflect minor refinements in this RCIS's habitat models. Tables G-1and G-2 show the habitat model parameters for plants and wildlife species that are included both in this RCIS as a focal species and in the Habitat Plan as a covered species.

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Table G-1 Habitat Distribution Model Comparison: Plants

Habitat Type	Santa Clara Valley Habitat Plan Habitat Model	Santa Clara County RCIS Habitat Model
Fragrant Fritillary		
Primary	Serpentine bunchgrass grassland between 0- and 1,500-feet elevation on slopes with all degrees of steepness.	Serpentine grassland between 0 and 1,500 feet in elevation on slopes with all degrees of steepness.
Secondary	Annual grassland, northern coastal scrub/Diablan sage scrub, and all oak woodland land cover types on slopes with all degrees of steepness between 0- and 1,500-feet elevation.	California annual grassland, northern coastal scrub/Diablan sage scrub and blue oak woodland, valley oak forest/woodland, coast live oak forest woodland, and mixed oak woodland and forest between 0- and 1,500-feet elevation on slopes with all degrees of steepness.
Loma Prieta hoita		
Primary	Mixed oak woodland and coast live oak forest and woodland between 100- and 2,000- feet elevation on slopes with all degrees of steepness and in all soil types but primarily on serpentine soils.	Coast live oak forest and woodland, mixed oak woodland and forest, and montane hardwood land cover types where they occurred on SSURGO map units with a serpentine soil component, and serpentine hardwood land cover types.
Secondary	Northern mixed chaparral/chamise chaparral and mixed serpentine chaparral between 0- and 2,000-feet elevation on slopes with all degrees of steepness. Northern mixed chaparral applies in all soil types.	Northern mixed chaparral/chamise chaparral, and mixed riparian forest and scrubland where they occurred on SSURGO map units with a serpentine soil component, serpentine chaparral, and serpentine riparian cover types between 100- and 2,000-feet elevation.
Mt. Hamilton Thistle		
Primary Habitat	Serpentine seeps or serpentine soils or grasslands within 25 feet of riverine habitat. This species is only found within the Guadalupe and Coyote watersheds.	Not included as a habitat type in this RCIS's model.
Potential Habitat	Not included as a habitat type in the Habitat Plan's model.	Serpentine seep/spring, serpentine grassland, and serpentine chaparral land cover types where they occur within 25 feet of perennial, intermittent, and ephemeral streams. Potential habitat includes potentially suitable habitat that does that does not overlap a known occurrence of Mount Hamilton thistle.
Occupied Habitat	Not included as a habitat type in the Habitat Plan's model.	All precise location CNDDB polygons and the area within a 25-foot buffer of the occurrence. Potential habitat that overlapped with occupied habitat was re-categorized as occupied habitat. Therefore, occupied habitat includes all known CNDDB occurrences recorded as a precise location.

Habitat Type	Santa Clara Valley Habitat Plan Habitat Model	Santa Clara County RCIS Habitat Model
Smooth Lessingia		
Habitat	Serpentine bunchgrass grassland and serpentine rock outcrops between 0- and 2,000-feet elevation on slopes with all degrees of steepness.	Serpentine grassland and serpentine rock outcrop land cover types between 0- and 2,000-feet elevation on slopes with all degrees of steepness.
Most Beautiful Jewelflower		
Primary	Serpentine bunchgrass grassland, serpentine rock outcrops/barren, and mixed serpentine chaparral between 0- and 3,500-feet elevation on slopes with all degrees of steepness.	Serpentine grassland, serpentine rock outcrop, and serpentine chaparral land cover types between 0- and 3,500 feet elevation on slopes with all degrees of steepness.
Secondary	Non-serpentine rock outcrops between 0- and 3,500-feet elevation on slopes with all degrees of steepness.	Non-serpentine rock outcrop (barren/rock land cover type) between 0- and 3,500-feet elevation on slopes with all degrees of steepness.

Table G-2 Habitat Distribution Model Comparison: Wildlife

Habitat Type	Santa Clara Valley Habitat Plan Habitat Model	Santa Clara County RCIS Habitat Model
California Tiger Salamander		
Occupied Habitat	Not included as a habitat type in the Habitat Plan's model.	Occupied habitat was designated using all CNDDB records with an extant record, indicating that the species is present at the location. This occupied habitat buffer is similar to the methodology used to display occupied habitat by buffering 1.3 miles from known extant occurrences in the recovery plan for the species.
Breeding and Foraging Habitat	All ponds (excluding percolation ponds), coastal and valley freshwater marshes, natural lakes, and seasonal wetlands within riparian, grassland, oak woodland, and conifer woodland land cover types.	All wetland and pond types (excluding seeps and reservoirs) that occur within grassland, woodland, riparian woodland, conifer forest, cultivated agriculture, and shrubland land cover types up to 3,940 feet elevation.
Upland and Refugia Habitat	Upland habitats that provide subterranean refugia for this species are assumed to be within 1.3 miles of primary habitat in grassland, chaparral and coastal scrub, oak woodland, riparian forest/scrub, riparian forest/woodland wetlands, conifer woodlands, and agricultural areas.	Upland habitat extends 1.3 miles around all areas designated as breeding habitat, excluding baylands and urban land cover types.
California Red-legged Frog		
Breeding and Foraging Habitat	All riverine, coastal and valley freshwater marshes, riparian forest/woodland wetlands, ponds (excluding percolation ponds), and natural lakes in riparian forest/scrub, grasslands, oak woodland, chaparral and coastal scrub, conifer woodland, and agriculture land cover types.	All wetland and ponds (excluding reservoirs) within conifer forest, cultivated agriculture, grassland, woodland, riparian woodland, and shrubland land cover types.
Refugia Habitat	All grassland, chaparral and coastal scrub, oak woodland, riparian forest/scrub, and conifer woodland land cover types within 100 feet of primary habitat are characterized as upland refugia. All grassland, chaparral and coastal scrub, oak woodland, riparian forest/scrub, conifer woodland, and agriculture land cover types beyond 100 feet but within 2 miles of primary habitat are characterized as dispersal habitat.	Refugia habitat is defined as a 100-foot buffer from all breeding habitat.
Dispersal Habitat	Not included as a habitat type in the Habitat Plan's model.	All suitable land cover types found within a 2-mile buffer of the breeding habitat, which includes all of the land cover types in the conifer forest, cultivated agriculture, grassland, riparian woodland, and shrubland communities.

Habitat Type	Santa Clara Valley Habitat Plan Habitat Model	Santa Clara County RCIS Habitat Model
Foothill Yellow-legged Frog		
Breeding and Foraging Habitat	Low gradient streams (0 to 4% slope) or rivers not regulated by a dam, in riparian forest/scrub, grassland, oak woodland, and conifer woodland land cover types.	Slow-gradient streams (0 to 11% slope) and streams not regulated by a dam (i.e., upstream of dams), in riparian forest/scrub, grassland, oak woodland, and conifer woodland land cover types. Breeding and foraging habitat includes a 165-foot buffer around rivers and streams associated with the following communities: conifer forests, woodlands, riparian woodlands, and shrublands.
Low Use Habitat	Moderate gradient streams (4% to 10% slope) or rivers in riparian woodland/scrub, grassland, oak savanna, and oak woodland land cover types.	The Habitat Plan identifies moderate gradient streams (4-11% slope) as low-use habitat. Because the RCIS slope data appear to overestimate the slopes of streams, the streams identified as low-use by the Habitat Plan were overlaid onto the RCIS stream layer to identify a range of slope in the RCIS slope data that characterizes streams defined as low-use by the Habitat Plan. This range of slope (11-18%) was then applied to streams outside the Habitat Plan area to define low-use streams for the entire RCIS area. Low-use habitat also includes a 165-foot buffer around rivers and streams associated with the following communities: conifer forests, woodlands, riparian woodlands, and shrublands.
Western Burrowing Owl		
Occupied Nesting Habitat (2017 SCVHA)	Occupied nesting includes sites occupied within the previous 3 years that are surrounded by at least 140 acres of foraging habitat within 0.5 mile of the nest site. The 140 acres parameter was mapped based on aerial photo analysis of known occupied nest sites.	This includes occupied nesting habitat, as mapped by the Santa Clara Valley Habitat Agency and provided to ICF for use in this RCIS. Occupied nesting habitat was mapped for known nesting sites and includes a 0.5-mile buffer around known nest sites to include suitable foraging habitat, as also used for the Habitat Plan. Suitable foraging habitat includes grassland and cultivated agricultural land cover types.
Potential Nesting/Overwintering Habitat	Any grassland, agricultural, or barren land cover types that are located outside of the 0.5-mile radius around occupied nest sites, and inside of one of the burrowing owl conservation zones.	Any grassland, agricultural, or barren land cover type located outside occupied nesting habitat, and inside the burrowing owl conservation zones used by the Santa Clara Valley Habitat Plan. The Habitat Plan's burrowing owl conservation zones are limited to the large valleys and a small amount of adjacent foothills within the Habitat Plan area
Overwintering Habitat	All annual grassland, serpentine bunchgrass grassland, valley oak woodland, agricultural, and barren land cover types with	Annual grassland, serpentine grassland, valley oak forest and woodland, agricultural, and barren land cover types with flat

Habitat Type	Santa Clara Valley Habitat Plan Habitat Model	Santa Clara County RCIS Habitat Model
	flat (0–5%) or moderate (5–25%) slopes, outside of one of the burrowing owl conservation zones shown.	(0–5%) or moderate (5–25%) slopes, outside of potential nesting and overwintering habitat.
Tricolored Blackbird		
Nesting Habitat	All riparian woodland and scrub land-cover types, coastal and valley freshwater marsh and ponds within grassland, oak woodland, riparian forest/scrub, grain/row-crop/hay/pasture, and barren land-cover types.	Wetland and pond land cover types (perennial freshwater marsh and pond) except seeps/springs (serpentine and non-serpentine) within grassland, oak woodland, riparian woodland, cultivated agriculture – undetermined, and grain, row crops, disked.
Foraging and Wintering Habitat	Seasonal wetlands, all grasslands, and all agricultural land cover types.	Wetland and pond land cover types (seasonal wetland) except seeps/springs (serpentine and non-serpentine); also cultivated agriculture, and grassland.
San Joaquin Kit Fox		
Movement and Foraging Habitat	All grassland land cover types and seasonal wetlands and ruderal areas that are adjacent to grasslands were considered suitable movement and foraging habitat for this species. Further, valley oak/grasslands, blue oak woodland, and coast live oak woodlands within 500-feet of suitable grasslands were also considered suitable movement and foraging habitat. These parameters were only considered suitable habitat within the Pacheco and South Santa Clara Valley watersheds. Small fragments of habitat that were disconnected from contiguous habitat blocks were removed from the results to better represent actual movement potential for the species.	All grassland land cover types and seasonal wetlands that are adjacent to grasslands. Valley oak forest and woodland, blue oak woodland, and coast live oak forest and woodland within 500-feet of suitable grasslands were also modeled as movement and foraging habitat. The model was further refined by only including habitat in those watersheds currently thought to have potential to support kit fox movement and dispersal.
Low-Use Movement Habitat	Areas that the San Joaquin kit fox may use occasionally for movement include orchards, golf courses/urban parks, and ruderal areas that are connected to movement and foraging habitat described above. These were intended to represent areas that individuals might pass through while moving between other more suitable habitat types.	Areas that San Joaquin kit fox may use occasionally for movement, including all cultivated agriculture types except vineyards and shrublands that are connected to (i.e., adjacent to) movement and foraging habitat described above. These areas represent land that individuals might pass through while moving between other more suitable habitat types. The model was further refined by only including habitat in those watersheds currently thought to have potential to support kit fox movement and dispersal.

Appendix H

Focal Species Habitat Models

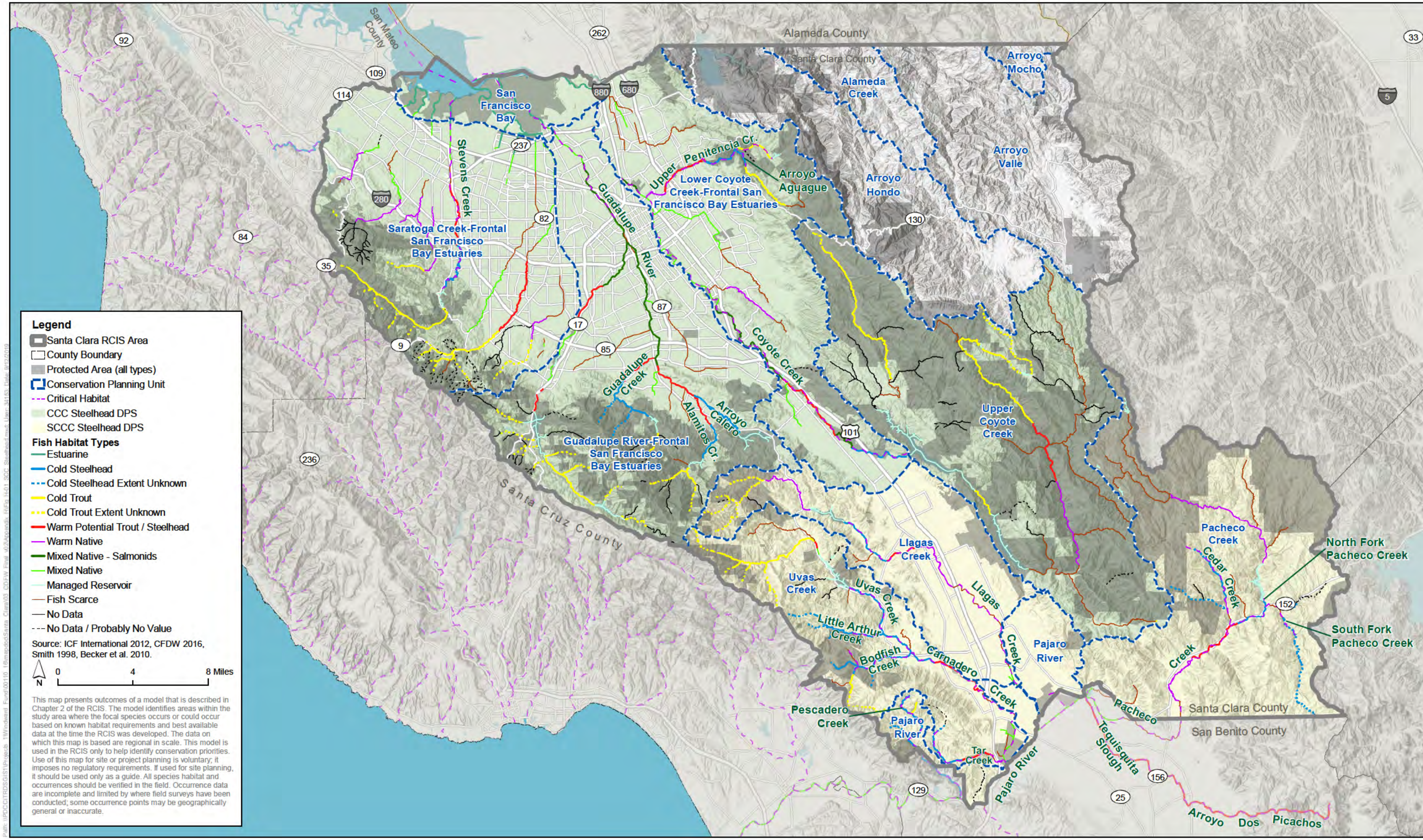

Figure H-1
Steelhead and Other Fish Communities

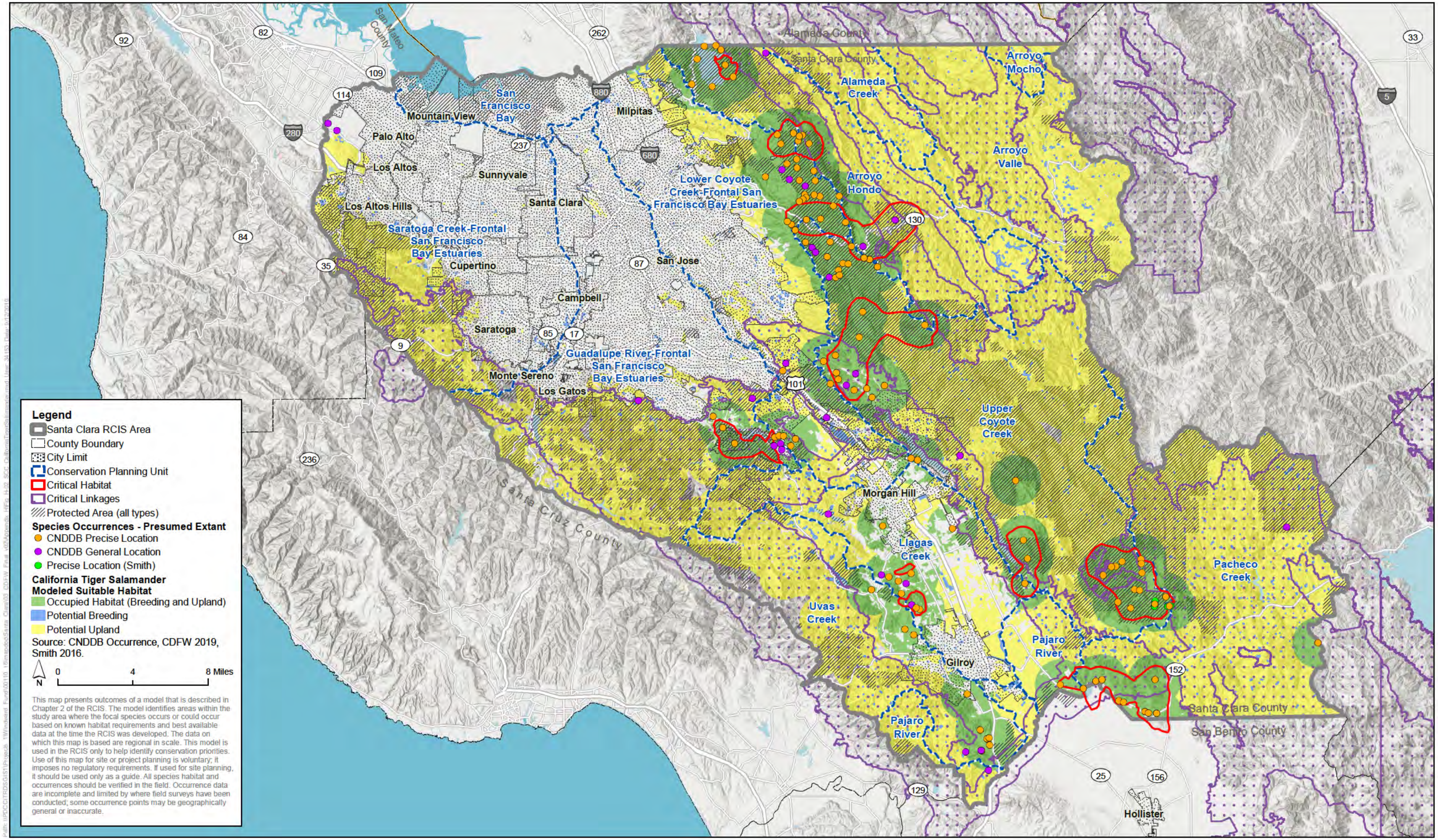

Figure H-2
California Tiger Salamander Modeled Habitat

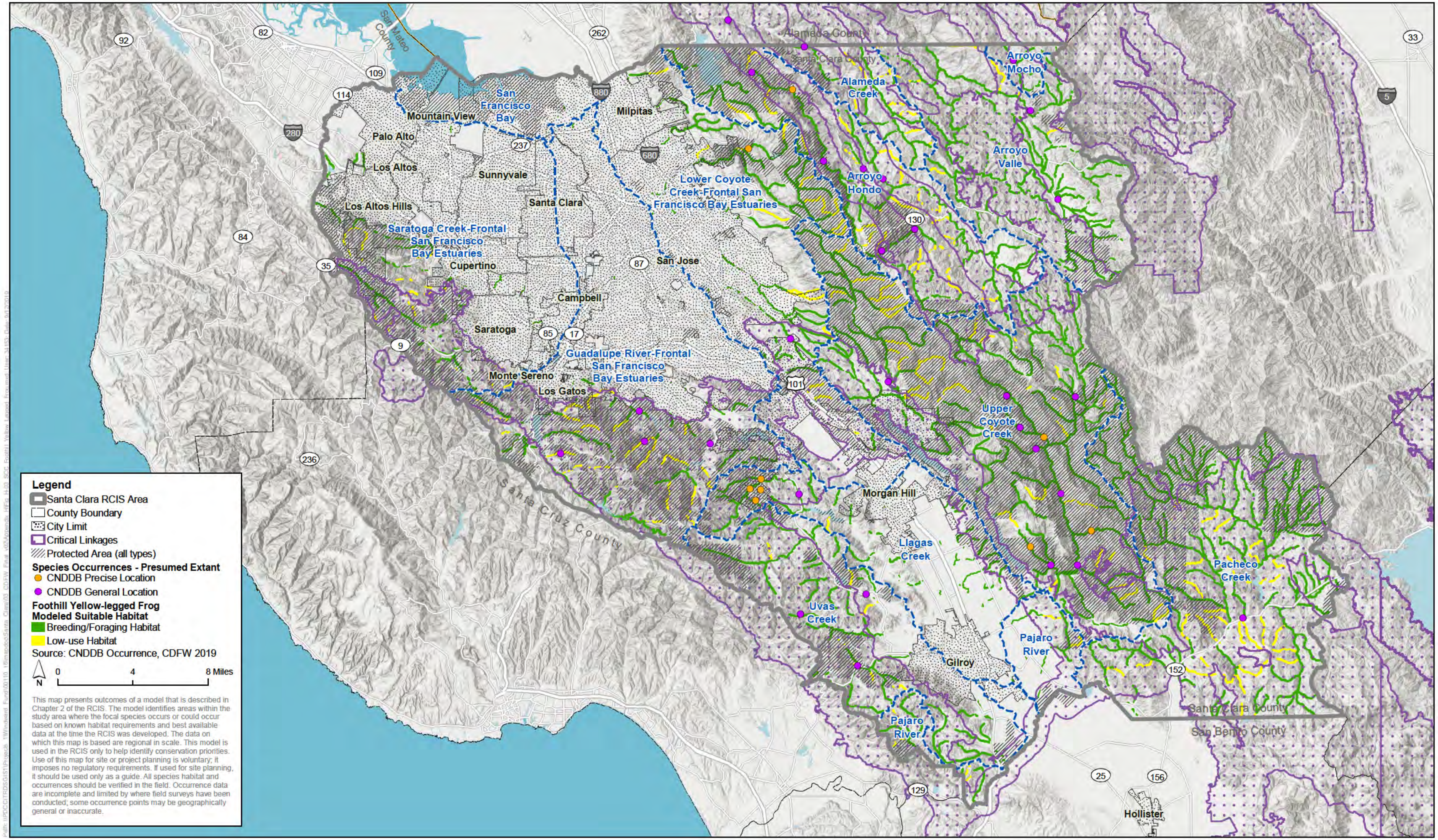

Figure H-3
Foothill Yellow-legged Frog Modeled Habitat

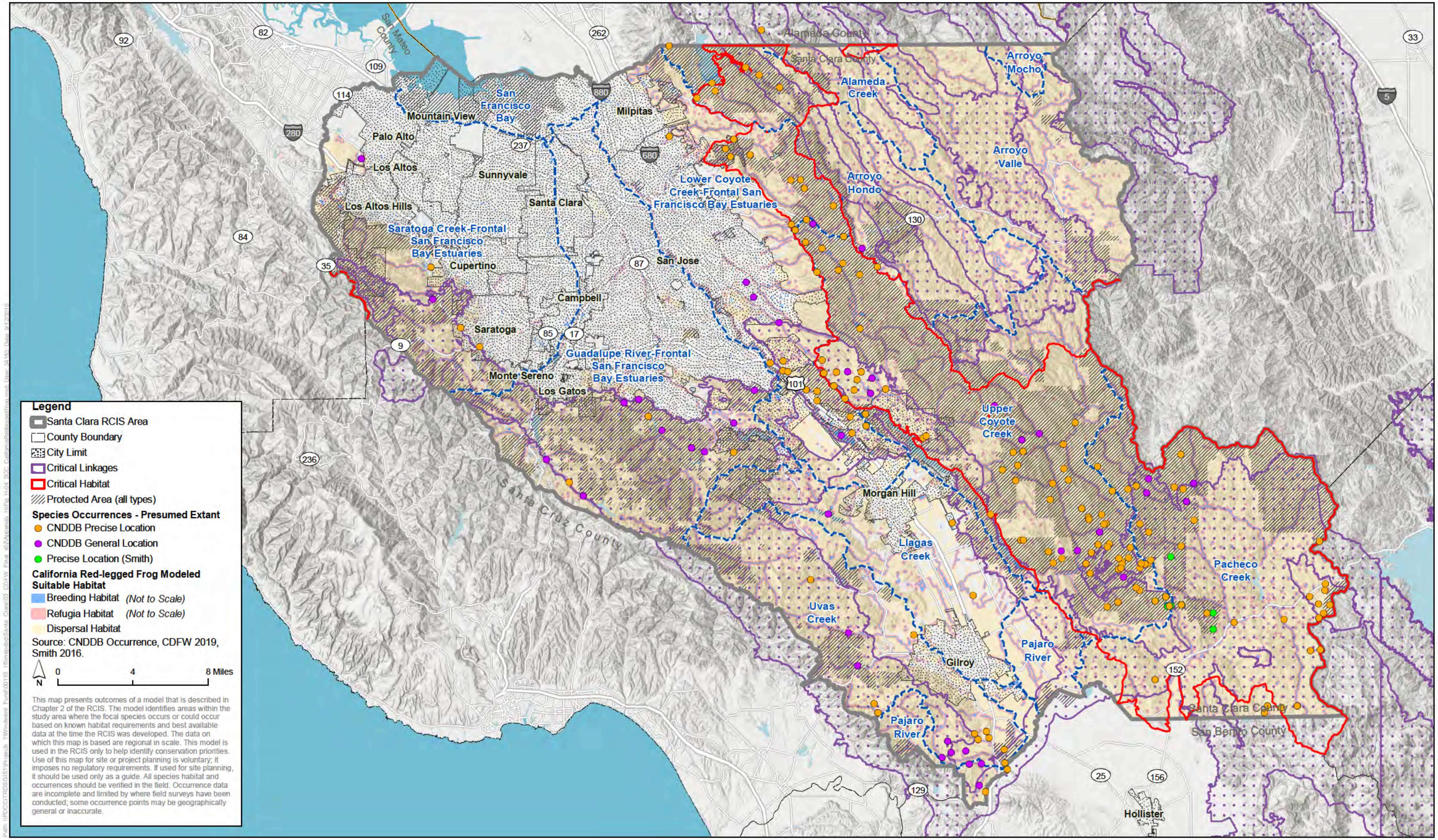

Figure H-4
California Red-legged Frog Modeled Habitat

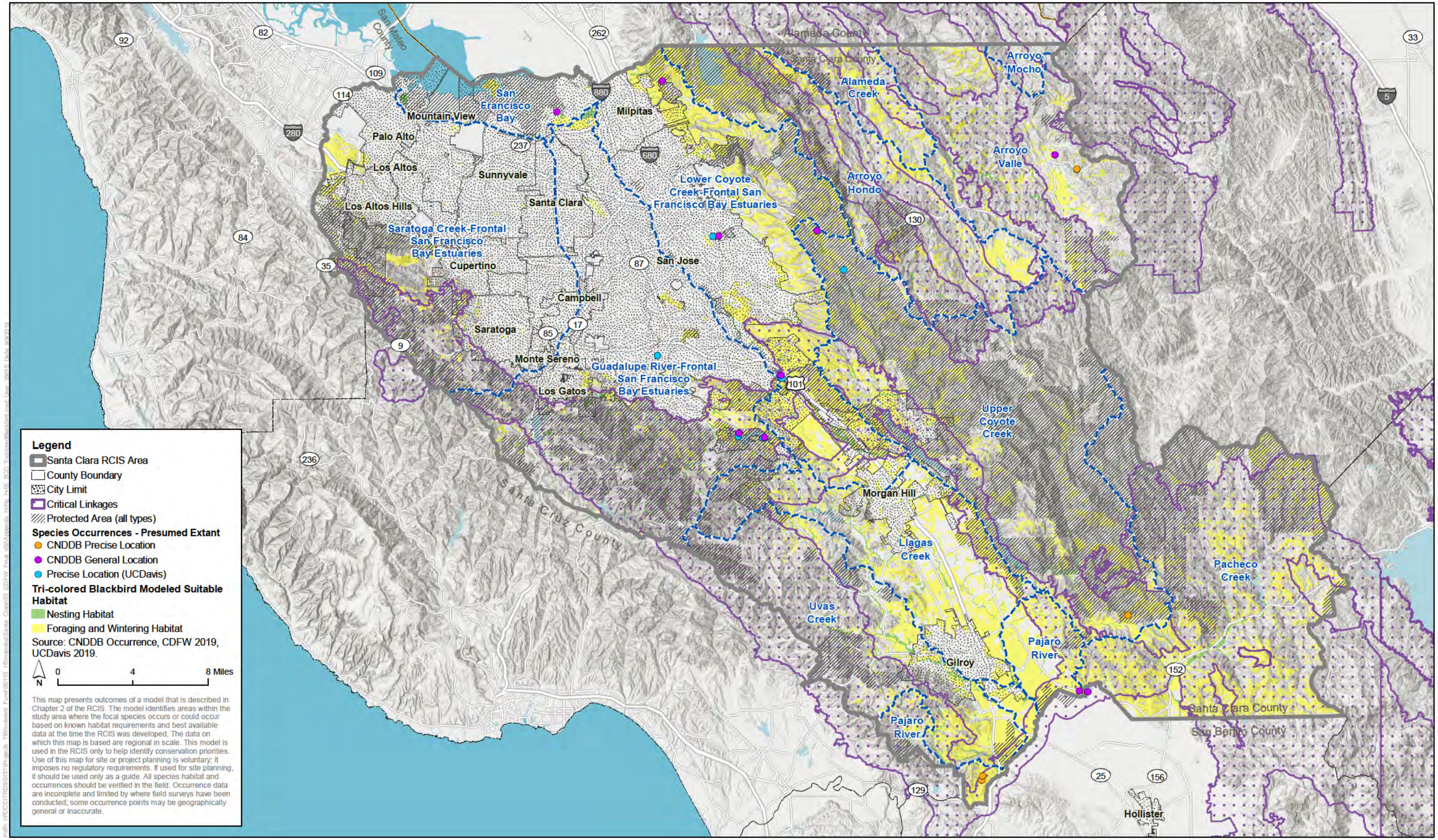

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Figure H-5
Tricolored Blackbird Modeled Habitat

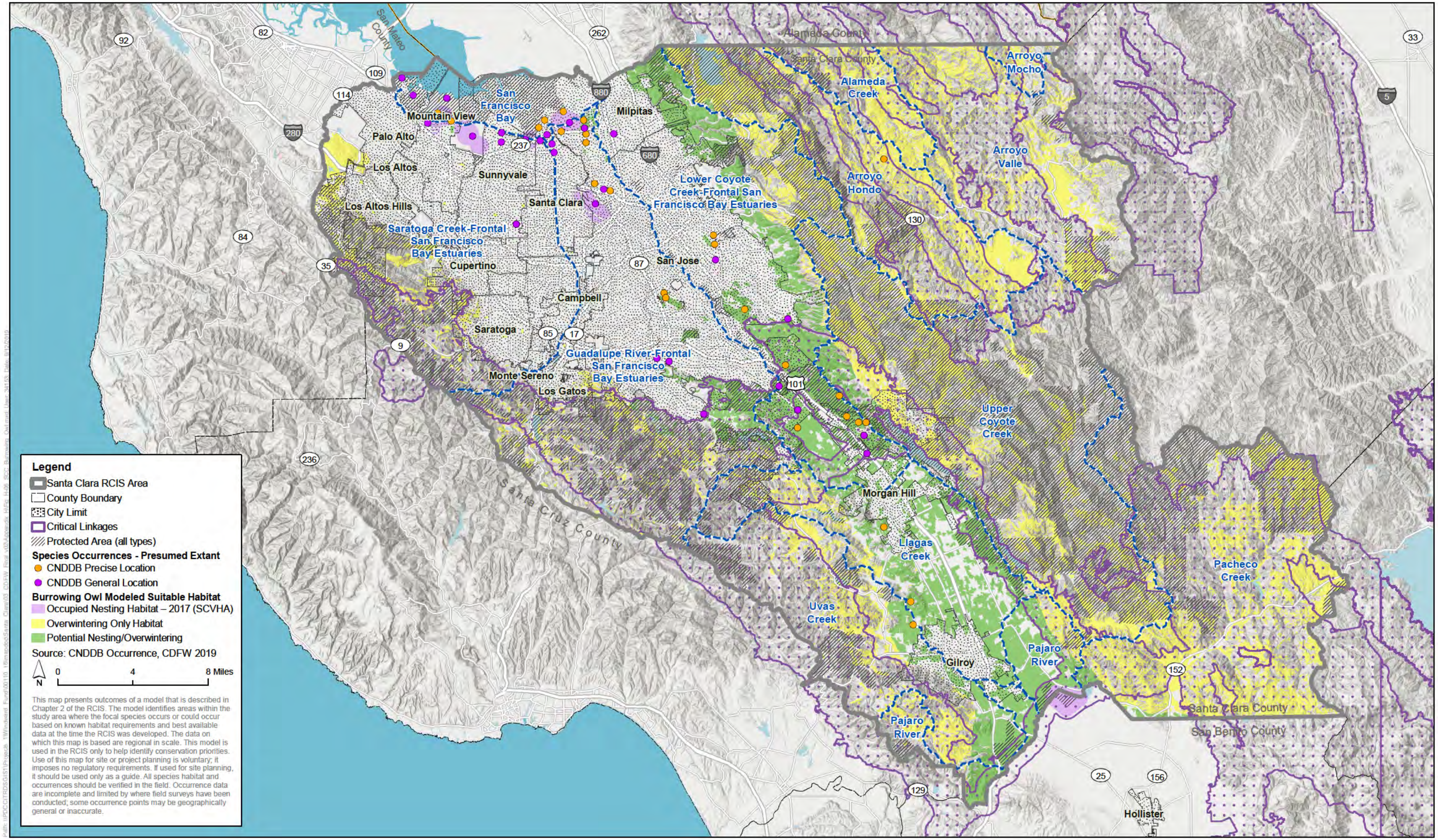

Figure H-6
Burrowing Owl Modeled Habitat

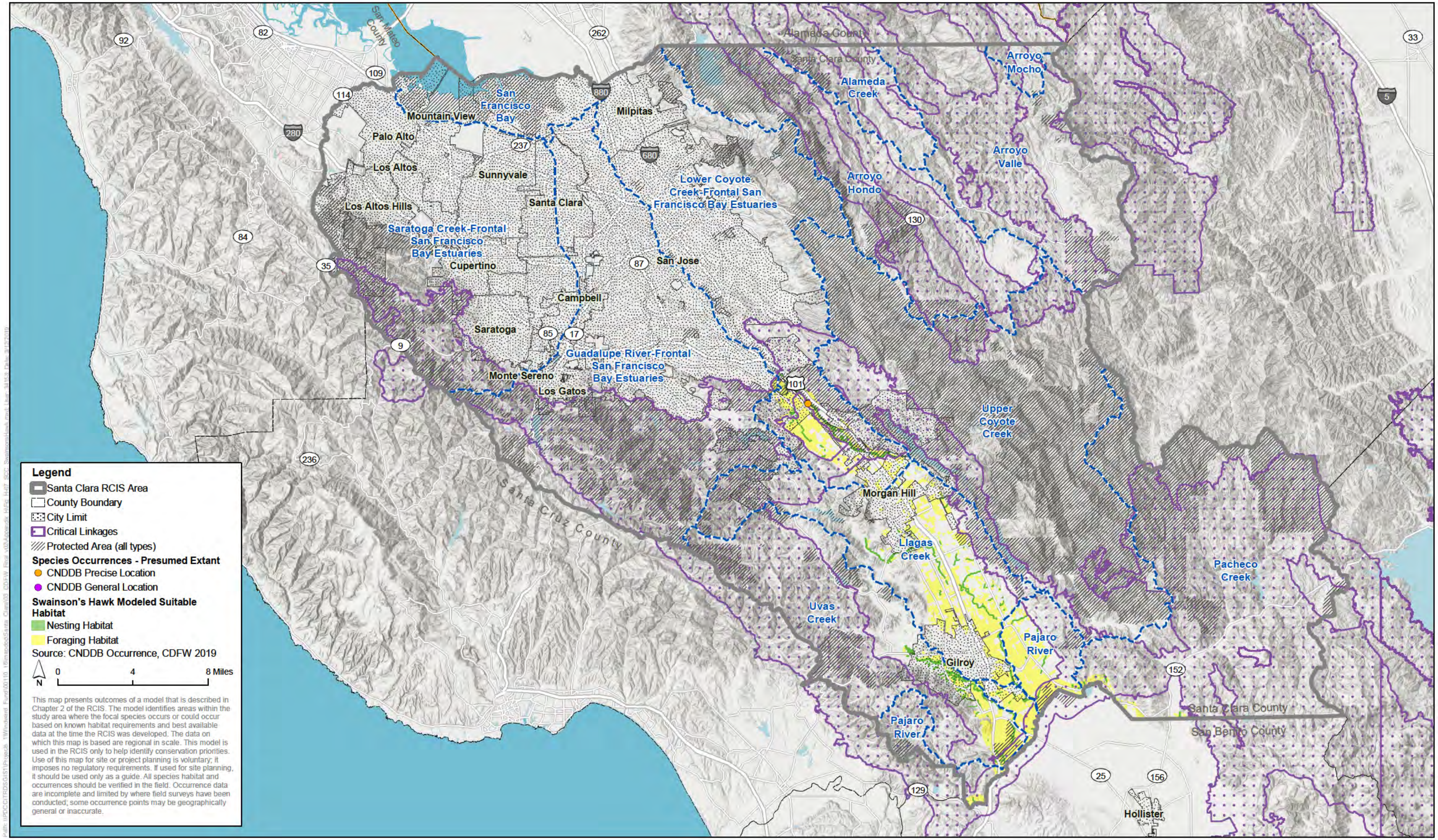

Figure H-7
Swainson's Hawk Modeled Habitat

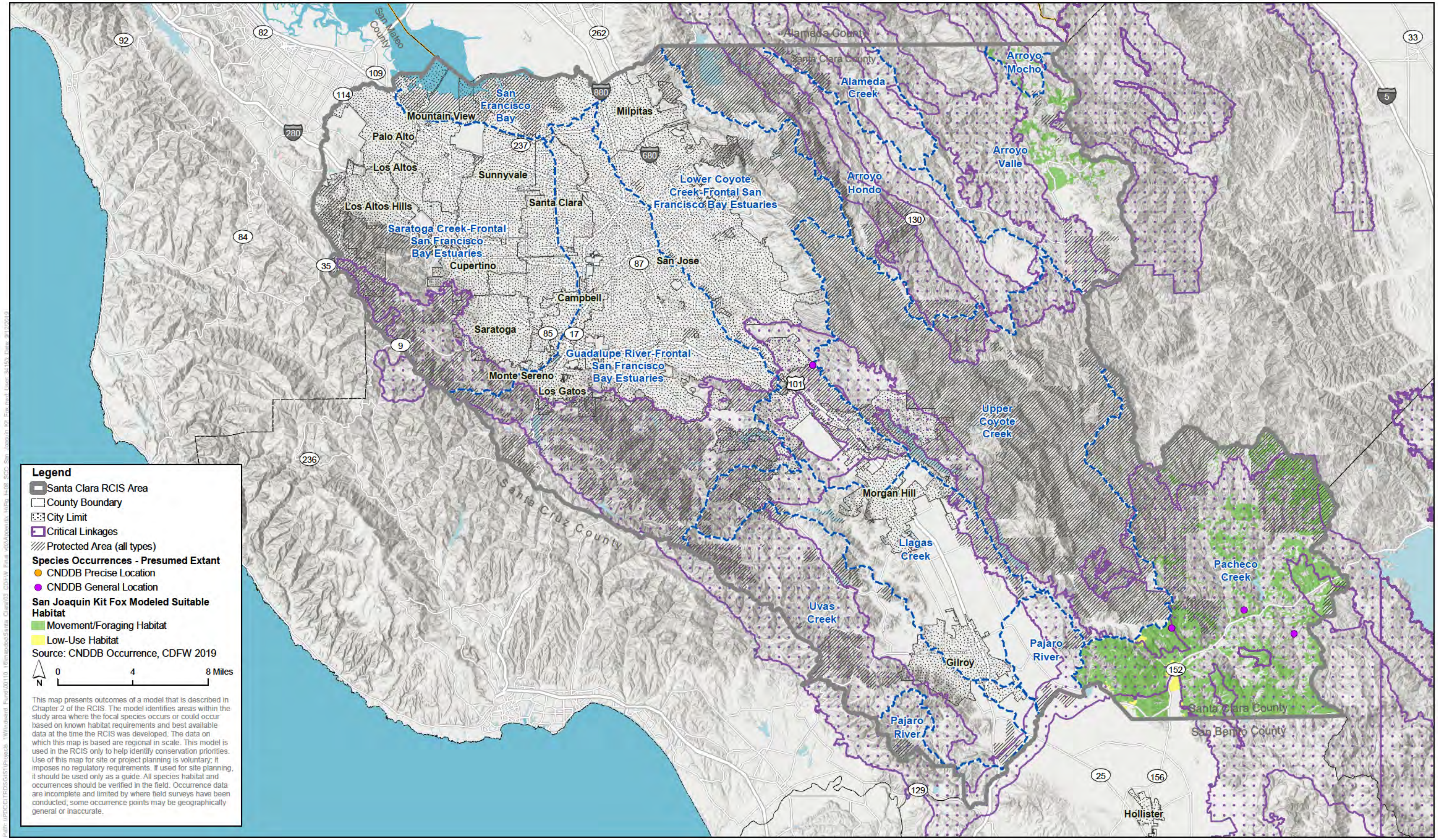

Figure H-8
San Joaquin Kit Fox Modeled Habitat

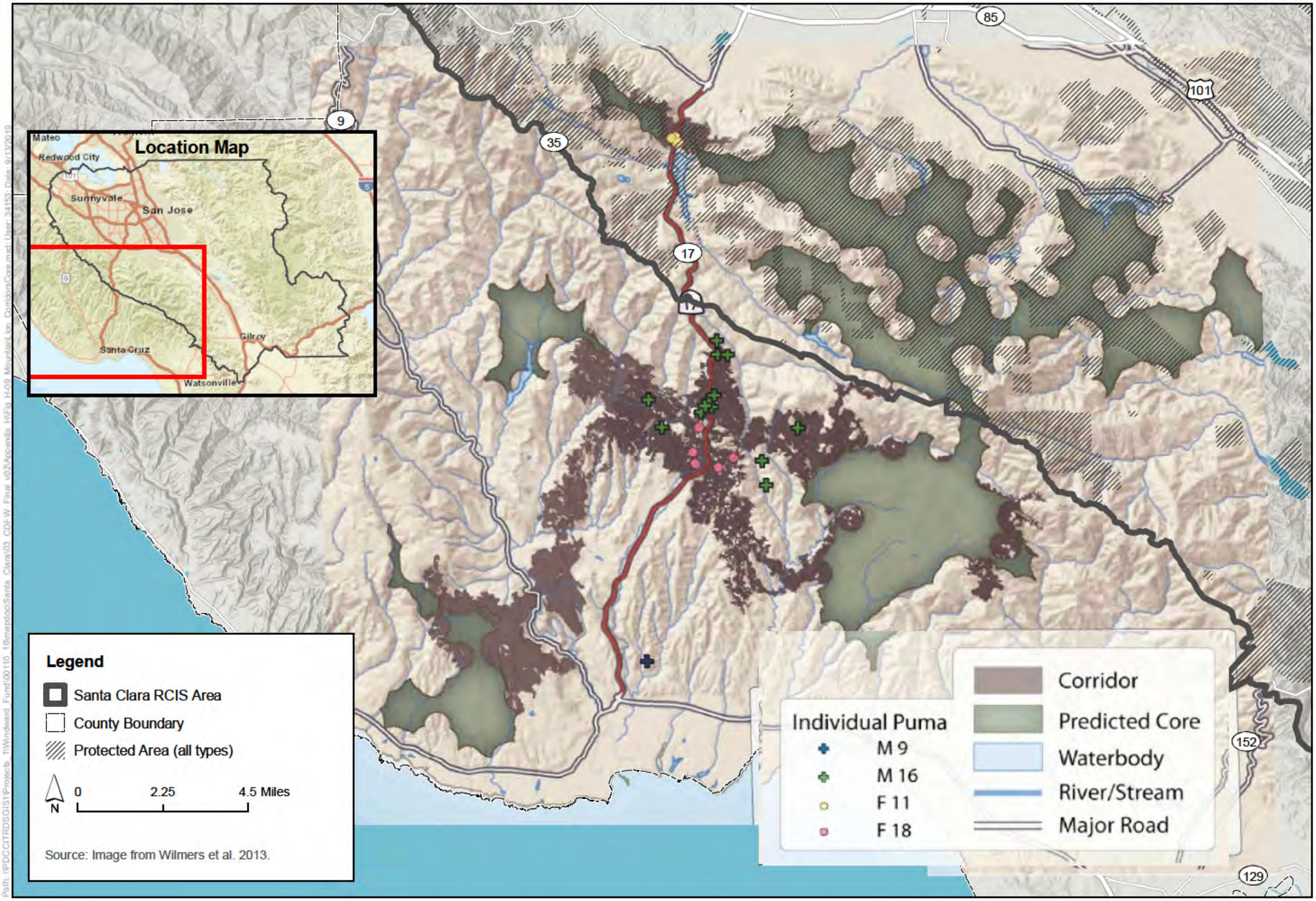

Figure H-9
Least-cost Corridors and Predicted Core Areas for Mountain Lion from Wilmers et al. (2013)

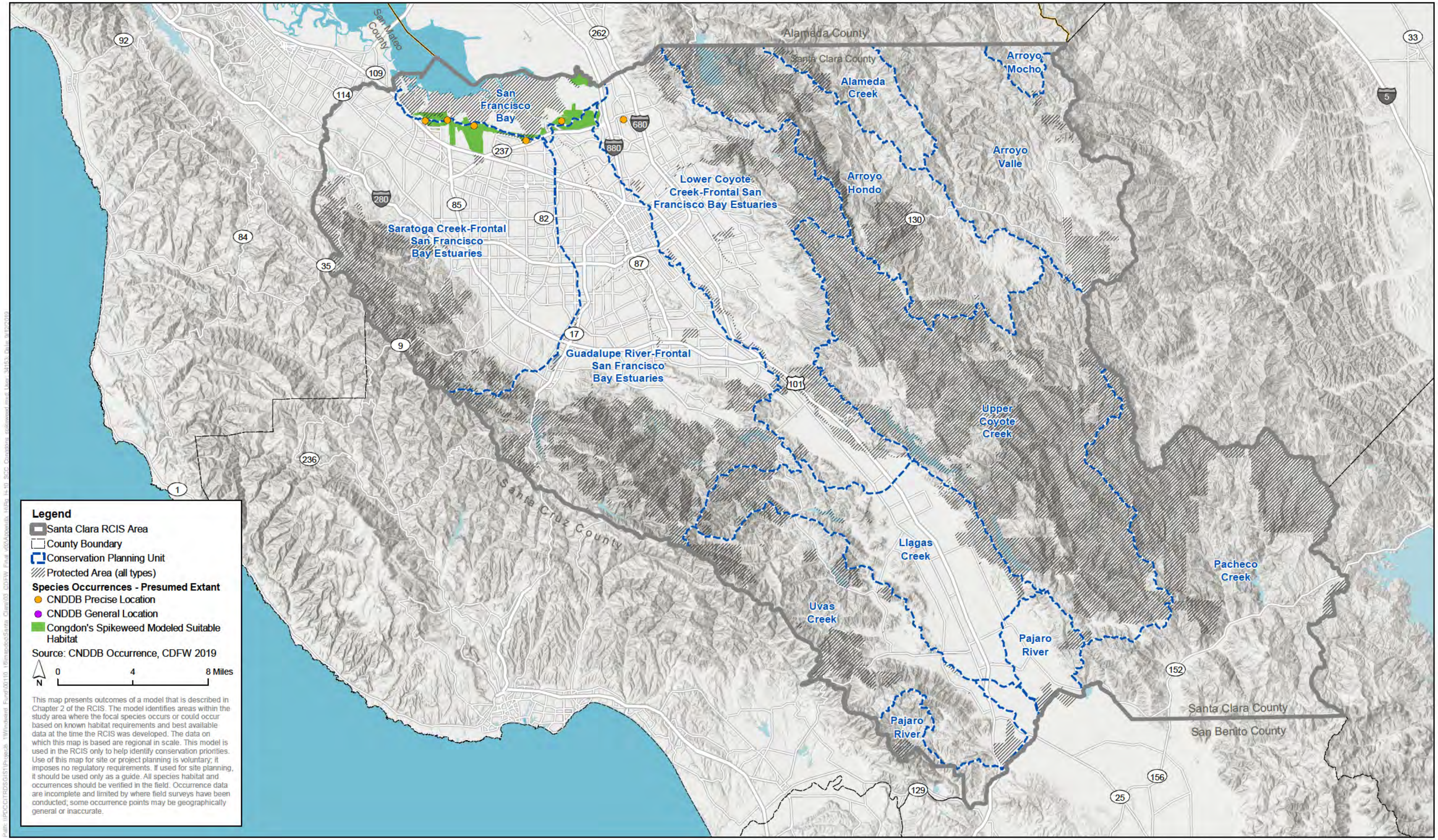

Figure H-10
Congdon's Spikeweed Modeled Habitat

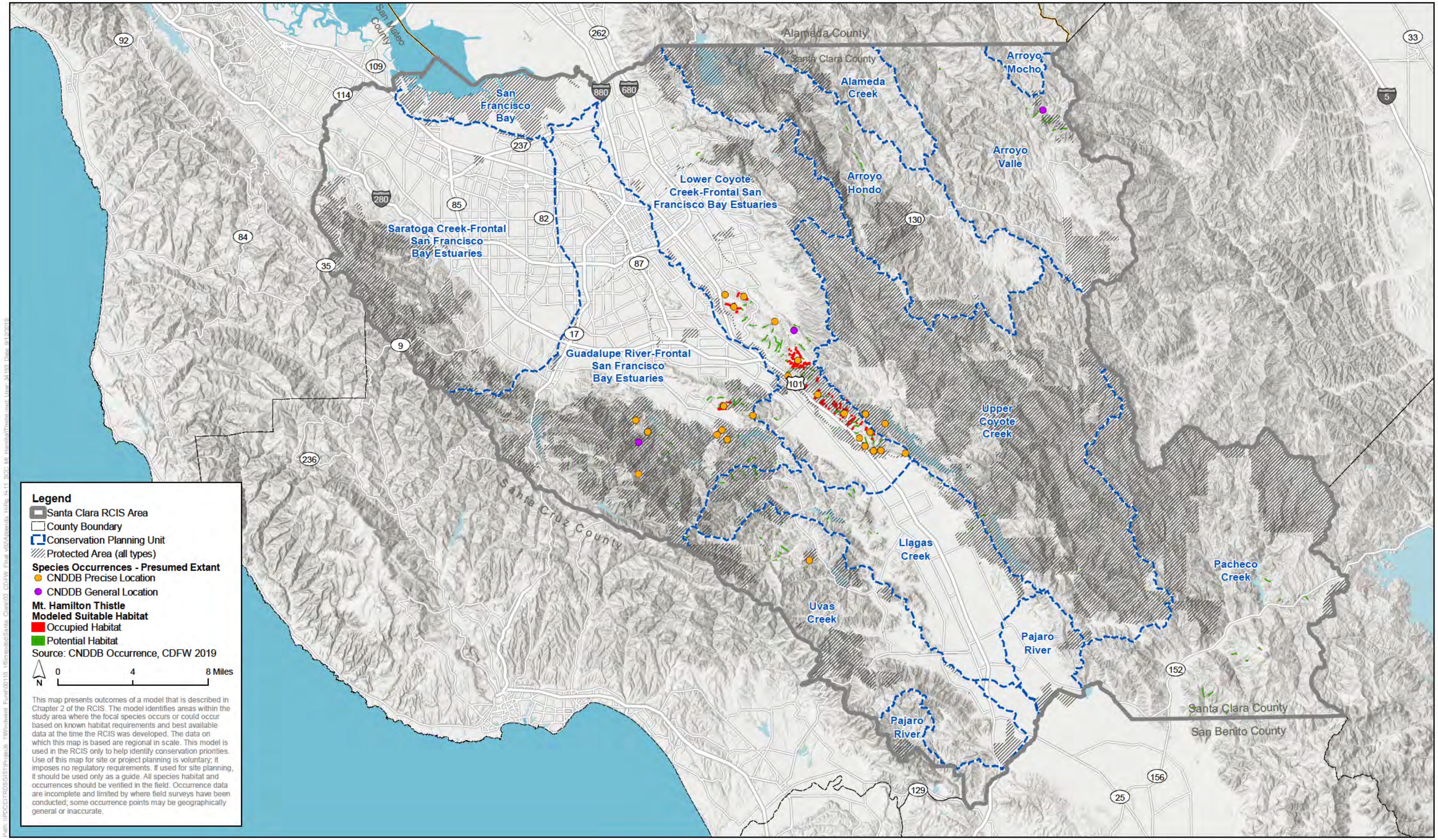

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Figure H-11
Mt. Hamilton Thistle Modeled Habitat

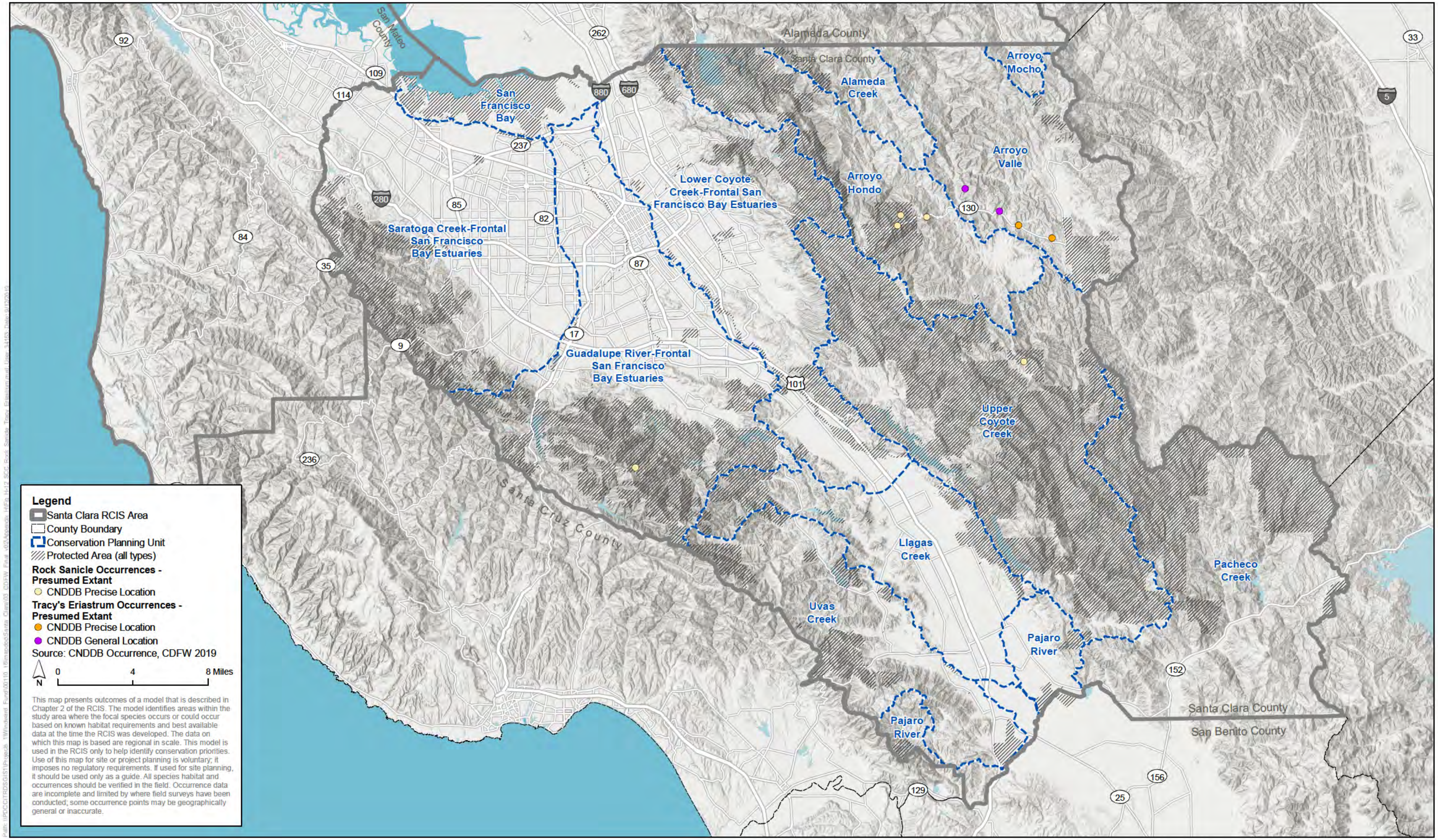

Figure H-12
Occurrences of Rock Sanicle and Tracy's Eriastrum

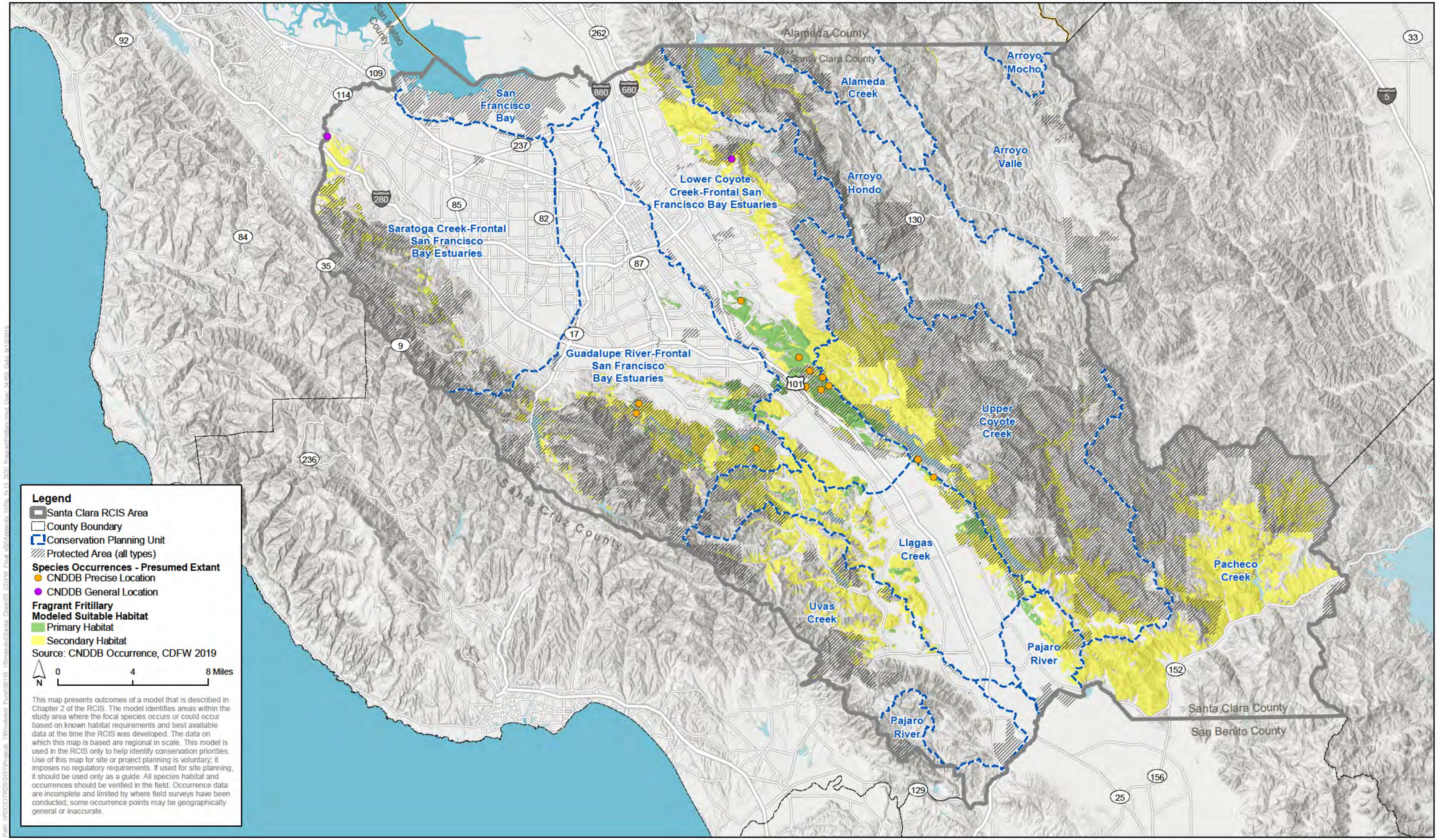

Figure H-13
Fragrant Fritillary Modeled Habitat

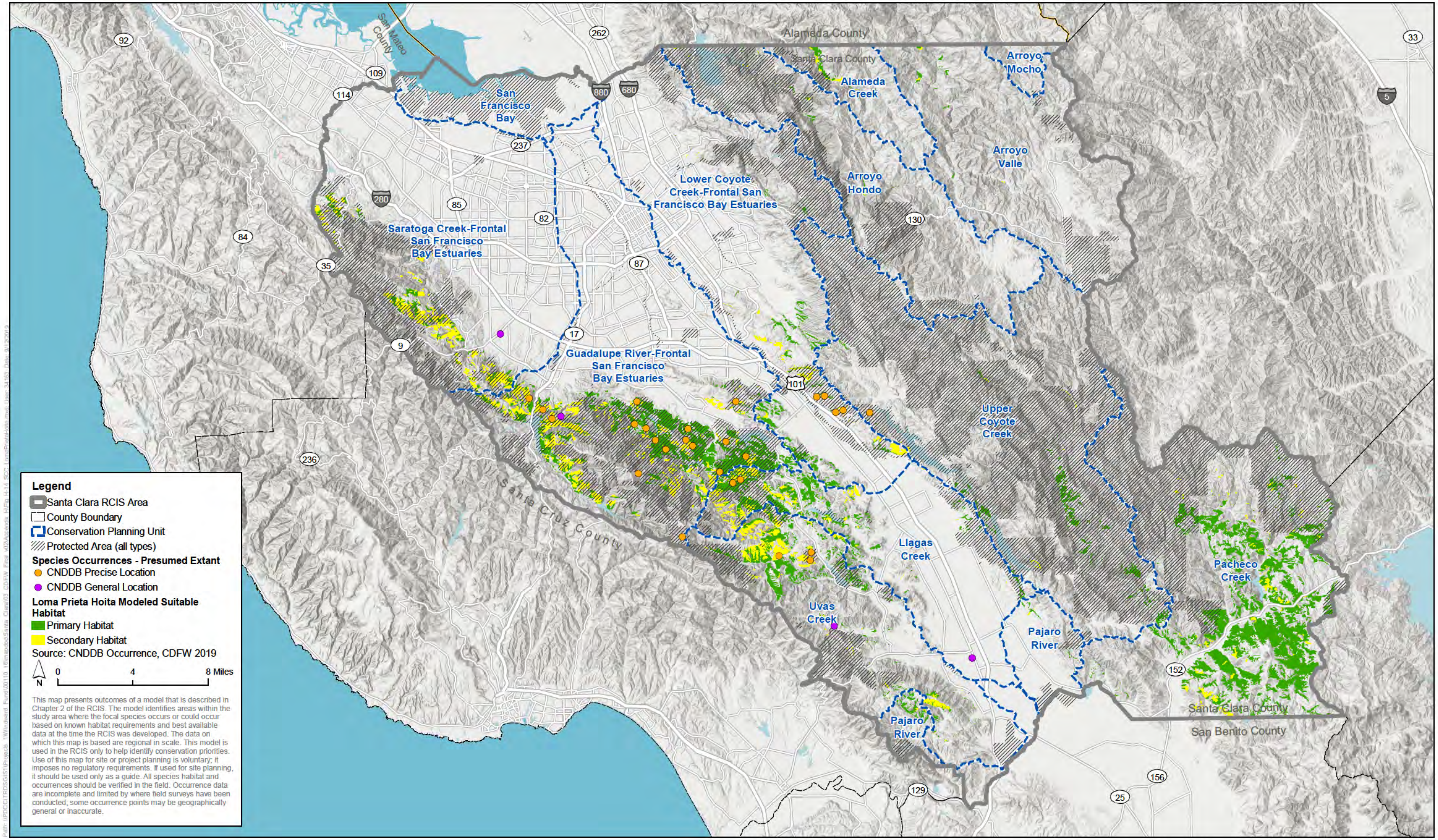

Figure H-14
Loma Prieta Hoita Modeled Habitat

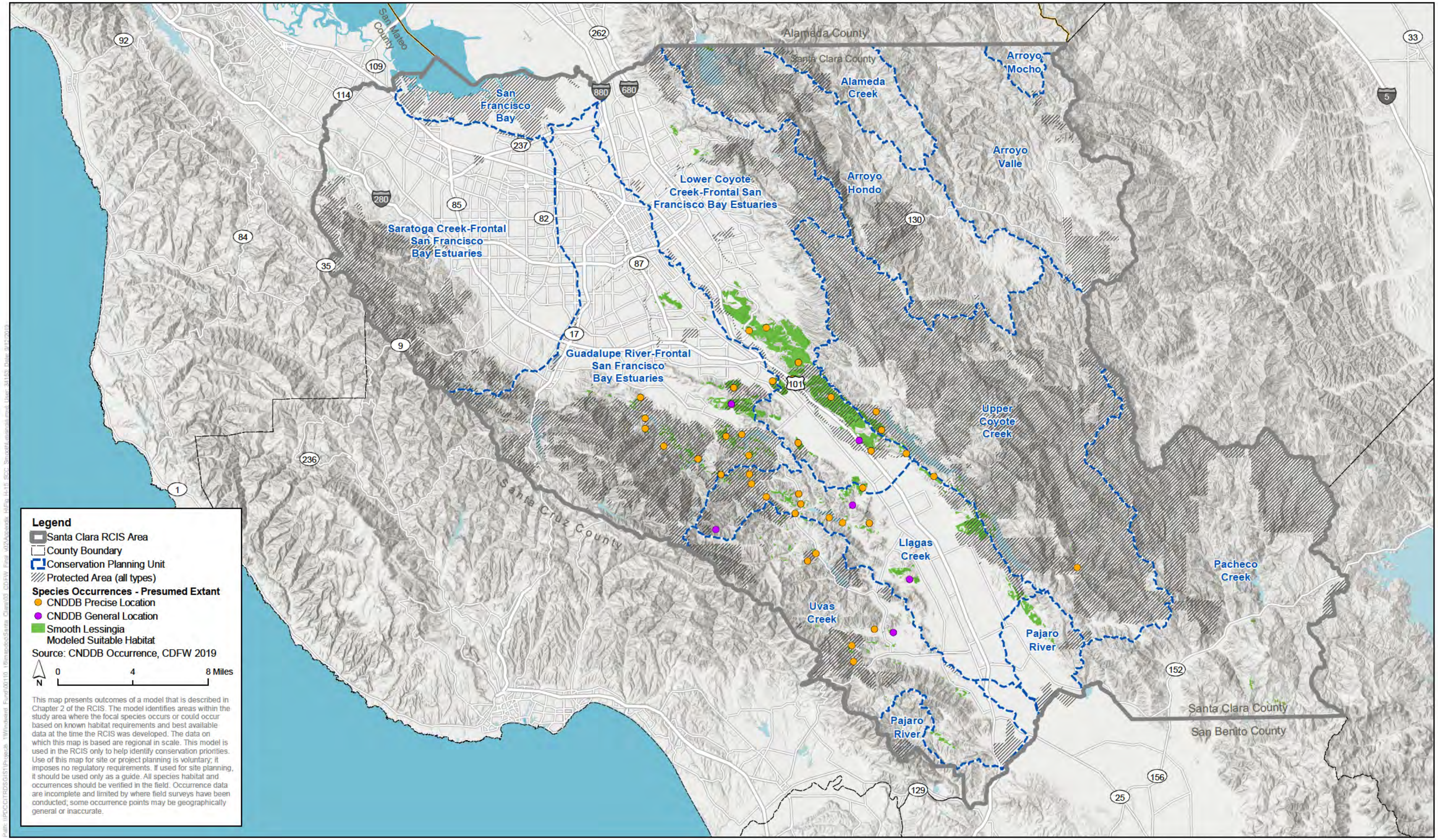

Figure H-15
Smooth Lessingia Modeled Habitat

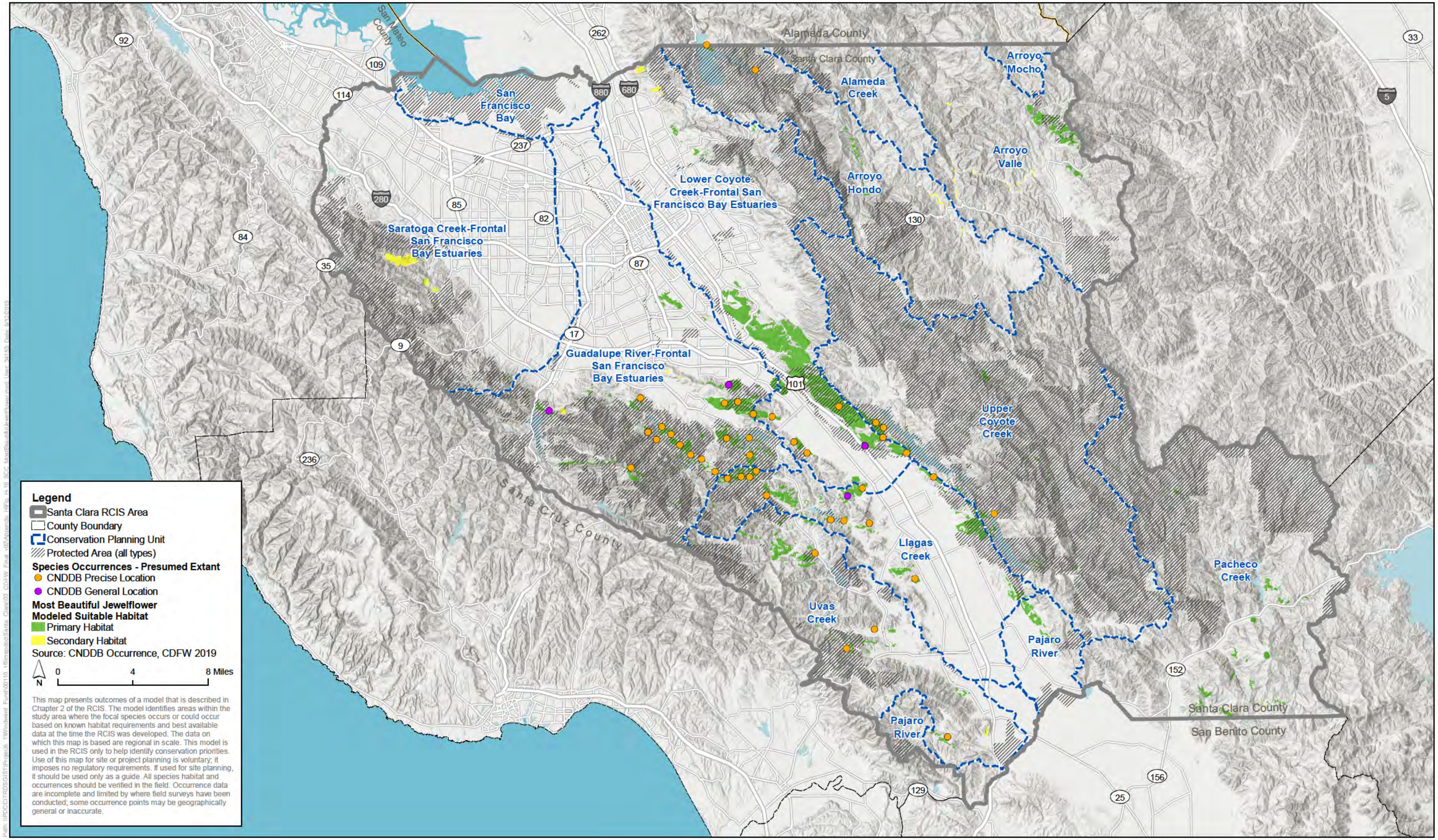

Figure H-16
Most Beautiful Jewelflower Modeled Habitat

Appendix I

Summary of Baylands Conservation Strategies

Appendix I
Summary of Baylands Conservation Strategies

This appendix provides a summary of conservation strategies from existing conservation plans that encompass the San Francisco baylands in the RCIS area. Table I-1 summarizes existing conservation strategies for species that rely on the baylands. Table I-2 summarizes existing bayland conservation strategies that address specific natural communities, species and their habitats, and locations in the baylands. Because of the extensive conservation planning in the baylands, this RCIS refers to the existing conservation plans to guide voluntary conservation actions, habitat enhancements, and the development of mitigation credit agreements (MCA) for the natural communities, focal species, non-focal species, and unique land cover types in the baylands. It is the intent of this RCIS that by identifying and summarizing the conservation needs of species and their habitats that rely on the baylands, credits may be created through an MCA to offset future impacts to the habitats and the associated non-focal species.

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Table I-1 Baylands Conservation Strategies: Species

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
Salt marsh harvest mouse *(Reithrodontomys raviventris)*				
The goals that follow are based on the following documents: • Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (https://www.fws.gov/sacramento/es/recovery-planning/tidal-marsh/Documents/TMRP_Volume1_RP.pdf) pp 355 • Baylands Ecosystem Habitat Goals Science Update 2015 (http://baylandsgoals.org/wp-content/uploads/2015/10/Baylands_Complete_Report.pdf) pp 135, pp 148, pp 154, pp 158 pp 209, pp 223				
• **1.0**: Acquire existing, historic, and restorable tidal marsh habitat to promote the recovery of listed species and the long-term conservation of species of concern and other tidal marsh species. • **2.0**: Manage, restore, and monitor tidal marsh habitat to promote the recovery of listed species and the long-term conservation of species of concern and other tidal marsh species. • **3.0**: Conduct range-wide species status surveys/monitoring and status reviews for listed species and species of concern covered in this recovery plan. • **4.0**: Conduct research necessary for the recovery of listed species and the long-term conservation of species of concern.	• **1.2.2.** Acquire/protect currently unprotected high marsh and ecotonal habitat and lands restorable to high marsh and ecotonal habitat for *Chloropyron molle* ssp. *molle*, *Cirsium hydrophilum* var. *hydrophilum*, California clapper rail, and salt marsh harvest mouse by purchase of fee title or conservation easement. **(Priority 1)** • **2.1.5.2** Minimize or avoid over-management of estuarine salinity variation. **(Priority 2)** • **2.1.8.2.1** Identify lands adjacent to the Bay Trail and other public access areas where human-related disturbance encourages predation that causes a threat to the California clapper rail and salt marsh harvest mouse. **(Priority 2)** • **2.1.9.2** Manage cattle grazing to minimize impacts to salt marsh harvest mouse, Suisun shrew, and the birds of the high tidal marsh, such as saltmarsh common yellowthroat. **(Priority 3)** • **2.2.1** Create an interdisciplinary review panel or similar group to coordinate and review the design of	• **4.2.7.1** Conduct a population viability analysis to determine desirable population sizes for long-term persistence of extant South Bay salt marsh harvest mouse populations. **(Priority 2)** • **4.2.7.2** Study use of adjacent habitat, including brackish marsh, by the salt marsh harvest mouse. **(Priority 1)** • **4.2.7.3** Study the impact of *Spartina alterniflora* and its hybrids, and *Lepidium latifolium* on the salt marsh harvest mouse. **(Priority 2)** • **4.2.7.4** Study predation impacts to the salt marsh harvest mouse. **(Priority 2)** • **4.3.1** Conduct a salt marsh harvest mouse population genetic analysis to determine: o the genetic effective population size o the genetic relationships among presumed populations	Table III-3: Summary of California Clapper Rail and Salt Marsh Harvest Mouse Recovery Criteria – highlights need by specific habitat complex	**Noted in objective/action**

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
	tidal marsh restoration projects throughout San Francisco Bay. **(Priority 2)** • **2.2.3.1** Protect, manage, and monitor large populations and occupied marsh complexes as interim reserves selected to represent the full range of both subspecies of salt marsh harvest mouse. **(Priority 1)** • **2.2.3.3** Transition from diked wetlands to restored or enhanced tidal marsh habitat, where feasible. **(Priority 3)** • **3.1.2.6** Monitor for salt marsh harvest mouse. **(Priority 2)** • Restore large areas of tidal marsh in diked and muted tidal marsh areas. • Where tidal marsh cannot be restored, improve water management to enhance diked wetlands through realigning levees and drainage ditches and connecting historic sloughs. • Enhance and restore the natural transition zone, focusing on tidal marsh transitions, incorporating protective buffers wherever possible, particularly around the base of alluvial fans to provide sediment to the terrestrial side of marshes. • Realign railways to allow for migration of the baylands with sea-level rise. • Increase the populations of threatened and endangered species through methods such as farming best practices to meet specific conservation objectives to buffer future impacts.	o the magnitude of gene exchange between marshes and subpopulations within marshes the extent of inbreeding occurring within populations **(Priority 1)**		

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
	• Reduce the runoff of agricultural contaminants and nutrients from agricultural activities to improve water quality in the adjacent wetlands • Restore tidal marsh throughout most of the segment prior to 2030, providing a continuous corridor of tidal marsh along the shore across a gradient of salt to brackish marsh • Protect existing muted tidal wetland for the salt marsh harvest mouse as insurance against fully tidal wetland being lost as a result of sea-level rise.			
The goals that follow are based on the following documents: • Baylands Ecosystem Habitat Goals (http://baylandsgoals.org/wp-content/uploads/2015/10/1999sfbaygoals031799.pdf) pp 136, pp 146, pp 162, pp 164				
Subregional Habitat Recommendations: • Coyote Creek Area	**Coyote Creek Area** • Restore tidal marsh throughout most of the segment, providing a continuous corridor of tidal marsh along the bayshore. The type of tidal marsh created (salt or brackish) will be dependent on the amount and proximity to local freshwater outflows. Restoration should emphasize reestablishing a natural transition between tidal marsh and adjacent wetlands and upland habitats, as well as transitions between salt and brackish tidal marsh. • Modify and manage a large complex of salt ponds for shorebirds and waterfowl. • Restore or enhance vernal pools in the adjacent undeveloped uplands.	*	*	**Coyote Creek Area** Pacific Gas and Electric Company transmission lines and other utility corridors, flood protection considerations, historical land subsidence, freshwater outflow from wastewater treatment facilities, operation and maintenance of salt ponds in absence of salt production, and smooth cordgrass.

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
	• Reestablish native riparian vegetation and otherwise improve the riparian corridor along Coyote Creek. • Manage discharges from the San José treatment plant to limit adverse environmental impacts, especially to tidal salt marsh habitat. Consider using recycled water to augment flows in Coyote Creek or for other habitat enhancements. •			
The goals that follow are based on the following documents: • Comprehensive Conservation Planning (https://www.fws.gov/uploadedFiles/DESFBFinalCCP_sm.pdf) pp 180				
• **1.0:** Protect and contribute to the recovery of endangered, threatened, and other special status species on the Refuge by conservation and management of the habitats on which these species depend.	• **1.1:** Conduct standardized monitoring efforts and research projects in coordination with other regional efforts for salt marsh harvest mouse and California clapper rail within five years. Improve high tide refugia for these species.	*	*	*
The goals that follow are based on the following documents: • South Bay Salt Pond Restoration Project Final EIS/R, 2 Description of Alternatives: (http://www.southbayrestoration.org/pdf_files/SBSP_EIR_Final/2_Alternatives%20Final%20EIS_R.pdf) pp 2-19				
• Restoration of tidal habitat benefits special-status and native species	• Contribute to the recovery of the South Bay subspecies of the salt marsh harvest mouse	• Likely decades for high-quality tidal marsh development • Monitoring not expected to begin for 5-10 years after pickleweed establishment in 300 acres or more	• Meet recovery plan criteria for salt marsh harvest mouse habitat within the South Bay Salt Pond Restoration Project Area • 75% of viable habitat areas within each large	*

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
			marsh complex with a capture efficiency level of 5.0 or better in five consecutive years	
Ridgeway's rail (California clapper rail) (*Rallus obsoletus*)				
The goals that follow are based on the following documents: • Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (https://www.fws.gov/sacramento/es/recovery-planning/tidal-marsh/Documents/TMRP_Volume1_RP.pdf) pp 335				
• **1.0**: Acquire existing, historic, and restorable tidal marsh habitat to promote the recovery of listed species and the long-term conservation of species of concern and other tidal marsh species. • **2.0**: Manage, restore, and monitor tidal marsh habitat to promote the recovery of listed species and the long-term conservation of species of concern and other tidal marsh species. • **3.0**: Conduct range-wide species status surveys/monitoring and status reviews for listed species and species of concern covered in this recovery plan. • **4.0**: Conduct research necessary for the recovery of listed species and the long-term conservation of species of concern.	• **1.2.1.1** Acquire/protect currently unprotected tidal marsh habitat. **(Priority 2)** • **1.2.1.2** Investigate opportunities to acquire/protect lands restorable to tidal marsh. **(**Priority **2)** • **1.2.2.** Acquire/protect currently unprotected high marsh and ecotonal habitat and lands restorable to high marsh and ecotonal habitat for *Chloropyron molle* ssp. *molle*, *Cirsium hydrophilum* var. *hydrophilum*, California clapper rail, and salt marsh harvest mouse by purchase of fee title or conservation easement. **(Priority 1)** • **2.1.6.1.1.3** Monitor the success of control at sites where non-native Spartina is managed and the ability of treated sites to support California clapper rails. **(Priority 1)** • **2.1.8.2.1** Identify lands adjacent to the Bay Trail and other public access areas where human-related disturbance encourages predation that causes a	• **4.2.6.1** Conduct a population viability analysis of the California clapper rail. **(Priority 1)** • **4.2.6.2** Study effects of recent non-native *Spartina* treatment on California clapper rail movement within the ecosystem. **(Priority 1)** • **4.2.6.3** Conduct diet analyses on California clapper rail as a tool to understanding habitat use. **(Priority 2)** • **4.4.3** Study the impacts of large-volume, human-caused, freshwater discharges into tidal marshes. **(Priority 2)** • **4.4.4** Investigate the effects of salinity fluctuation and altered tidal datum on species covered in this recovery plan. **(Priority 2)** • **4.4.5** Study the time lag between habitat restoration and recolonization by species covered in this recovery plan. **(Priority 2)** • **4.4.6** Conduct research on the physical processes (geomorphic	• Table III-3: Summary of California Clapper Rail and Salt Marsh Harvest Mouse Recovery Criteria – highlights need by specific habitat complex	**Noted in objective/action**

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
	threat to the California clapper rail and salt marsh harvest mouse. **(Priority 2)** • **2.1.8.2.3** Implement and enforce pet restrictions. **(Priority 2)** • **2.1.8.2.4** Avoid relocation of nuisance animals in California clapper rail habitat. **(Priority 2)** • **2.2.1** Create an interdisciplinary review panel or similar group to coordinate and review the design of tidal marsh restoration projects throughout San Francisco Bay. **(Priority 2)** • **3.1.1.1** Review existing species survey guidance to determine its adequacy. **(Priority 3)** • **3.1.1.2** If necessary, revise existing guidance or develop new standardized, scientifically based, and species-specific survey guidance. **(Priority 3)** • **3.1.2.5.1** Develop certification/training programs for California clapper rail surveyors and survey coordinators. **(Priority 3)** • **3.1.2.5.2** Conduct annual California clapper rail call counts during breeding season. **(Priority 2)** • **3.1.2.5.3** Monitor adult California clapper rail survival and mortality of adults, chicks, and eggs due to predation. **(Priority 2)** • **3.1.2.5.4** Develop and maintain a database to track results from annual California clapper rail monitoring results. **(Priority 2)**	and hydrologic) that maintain the structure and function of suitable habitats for tidal marsh species. **(Priority 2)** • **4.4.7** Study the effects of global climate change and resulting sea level rise on tidal marsh ecosystems. **(Priority 1)** • **4.4.8** Conduct research on management conflicts between tidal marsh species. **(Priority 2)** • **4.5.2.1** Conduct research into mercury exposure pathways for California clapper rails and potential means to interrupt those pathways. **(Priority 2)** • **4.5.2.2** Conduct other necessary research on bioaccumulation and effects, including reproductive success and development, of toxic estuarine contaminants on tidal marsh species. **(Priority 2)** • **4.5.2.3** Apply results of research in Action 4.5.2.2 to re-evaluate suitability of delisting criterion E/5 for the California clapper rail and revise, if appropriate. **(Priority 3)** • **4.5.2.4** Apply results of research in Actions 4.2.4.2.1 and 4.2.4.2.2 to sediment and water quality standards to protect sensitive wildlife of the San Francisco Bay Estuary. **(Priority 3)** • **4.5.2.5** Conduct studies to establish contaminant levels in biosentinels that are "acceptable"		

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
	• **3.1.2.5.5** Examine the methodology used for call count surveys in • Action 3.1.2.5.2 above, by cross validating surveys (using double observer methods) with movement studies recommended in Action 4.2.6.2. **(Priority 3)**	or "not acceptable", then measure compounds in these biosentinels directly or via a non-invasive surrogate, such as feathers, if possible. **(Priority 1)** • **4.7** Establish research protocols, where necessary, and as determined by the RIT, described below. **(Priority 3).** For example, establish protocols for handling sick, injured, oiled, and dead California clapper rails or salvaged eggs. • **4.8** Conduct additional research identified as necessary by the Recovery Implementation Team that address changing conditions and are supportive of highest priority recovery tasks. **(Priority 2)** • **4.9** Apply the results of all studies to conservation and recovery efforts. **(Priority 2)**		
The goals that follow are based on the following documents: • Baylands Ecosystem Habitat Goals (http://baylandsgoals.org/wp-content/uploads/2015/10/1999sfbaygoals031799.pdf) pp 136, pp 146, pp 160, pp 162, pp164, pp 166, pp168, pp 170				
Subregional Habitat Recommendations: • Mountain View • Coyote Creek	**Mountain View** • Restore large areas of tidal marsh and provide a continuous corridor of tidal marsh along the bayshore. • Provide more and wider buffers to tidal marshes and improve management to reduce human intrusion and predators.	*	*	**Mountain View** Pacific Gas and Electric Company transmission lines and other utility corridors, flood protection considerations, historical land subsidence,

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
	• Modify and manage two or three complexes of salt ponds, including the pond adjacent to the Dumbarton Bridge, for shorebirds, waterfowl, and post-breeding least terns. • Enhance the seasonal wetlands and burrowing owl habitat in the Sunnyvale baylands. • Reestablish native vegetation and otherwise enhance the riparian corridor along San Francisquito Creek, Guadalupe River, and other tributary streams. **Coyote Creek** • Restore tidal marsh throughout most of the segment, providing a continuous corridor of tidal marsh along the bayshore. The type of tidal marsh created (salt or brackish) will be dependent on the amount and proximity to local freshwater outflows. Restoration should emphasize reestablishing a natural transition between tidal marsh and adjacent wetlands and upland habitats, as well as transitions between salt and brackish tidal marsh. • Modify and manage a large complex of salt ponds for shorebirds and waterfowl. • Restore or enhance vernal pools in the adjacent undeveloped uplands. • Reestablish native riparian vegetation and otherwise improve the riparian corridor along Coyote Creek.			freshwater outflow from wastewater treatment facilities, operation and maintenance of salt ponds in absence of salt production, and smooth cordgrass. **Coyote Creek** Pacific Gas and Electric Company transmission lines and other utility corridors, flood protection considerations, historical land subsidence, freshwater outflow from wastewater treatment facilities, operation and maintenance of salt ponds in absence of salt production, and smooth cordgrass.

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
	• Manage discharges from the San José San José treatment plant to limit adverse environmental impacts, especially to tidal salt marsh habitat. Consider using recycled water to augment flows in Coyote Creek or for other habitat enhancements.			
The goals that follow are based on the following documents: • Comprehensive Conservation Planning (https://www.fws.gov/uploadedFiles/DESFBFinalCCP_sm.pdf) pp 180				
• **1.0:** Protect and contribute to the recovery of endangered, threatened, and other special status species on the Refuge by conservation and management of the habitats on which these species depend.	• **1.1:** Conduct standardized monitoring efforts and research projects in coordination with other regional efforts for salt marsh harvest mouse and California clapper rail within five years. Improve high tide refugia for these species. • **1.4:** Improve ecological function of tidal and managed marsh, especially at La Riviere Marsh, Mayhews Landing, and New Chicago Marsh units in order to enhance tidal marsh habitat.	*	*	*
California black rail *(Laterallus jamaicensis* ssp. *coturniculus)*				
The goals that follow are based on the following documents: • Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (https://www.fws.gov/sacramento/es/recovery-planning/tidal-marsh/Documents/TMRP_Volume1_RP.pdf) pp 355; Appendix C				
• **2.0**: Manage, restore, and monitor tidal marsh habitat to promote the recovery of listed species and the long-term conservation of species of concern and other tidal marsh species. • **3.0**: Conduct range-wide species status surveys/monitoring and status reviews for listed species and	• **2.1.8.2.3** Implement and enforce pet restrictions. **(Priority 2)** • **3.1.2.9** Continue to conduct surveys/monitoring of California black rail. **(Priority 3)**	• **4.2.10** Conduct biological and ecological studies on the California black rail. **(Priority 3)** • **4.4.8** Conduct research on management conflicts between tidal marsh species. **(Priority 2)**		**Noted in objective/action**

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
species of concern covered in this recovery plan. • **4.0**: Conduct research necessary for the recovery of listed species and the long-term conservation of species of concern.				
The goals that follow are based on the following documents: • South Bay Salt Pond Restoration Project Final EIS/R, 2 Description of Alternatives: (http://www.southbayrestoration.org/pdf_files/SBSP_EIR_Final/2_Alternatives%20Final%20EIS_R.pdf) pp 2-19				
• Restoration of tidal habitat benefits special-status and native species	• Contribute to the recovery of the South Bay subspecies of the salt marsh harvest mouse	• Likely decades for high-quality tidal marsh development • Monitoring not expected to begin for 5-10 years after pickleweed establishment in 300 acres or more	• Meet recovery plan criteria for salt marsh harvest mouse habitat within the South Bay Salt Pond Restoration Project Area • 75% of viable habitat areas within each large marsh complex with a capture efficiency level of 5.0 or better in five consecutive years	*
California least tern *(Sterna antillarum browni)*				
The goals that follow are based on the following documents: • Comprehensive Conservation Planning (https://www.fws.gov/uploadedFiles/DESFBFinalCCP_sm.pdf) pp 180				
• **1.0:** Protect and contribute to the recovery of endangered, threatened, and other special status species on the Refuge by conservation and	• **1.3:** Provide appropriate habitat for at least one California least tern colony within the pond complexes to support an average of one fledged chick per nest over a 15-year period, with at	*	*	*

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
management of the habitats on which these species depend.	least ten nests established annually following habitat creation.			
The goals that follow are based on the following documents: • South Bay Salt Pond Restoration Project Final EIS/R, 2 Description of Alternatives: (http://www.southbayrestoration.org/pdf_files/SBSP_EIR_Final/2_Alternatives%20Final%20EIS_R.pdf) pp 2-23				
• Maintain numbers of post-breeding California least terns in the Project Area at multiyear average levels including natural variation in numbers; avoid negative effect of SBSP Restoration Project on Bay Area least tern breeding bird numbers (multi-year average levels with natural variation)	*	*	*	*
California central coast steelhead/South-central California coast steelhead *(Oncorhynchus [=salmo] mykiss)* *Note: steelhead are not specified to distinct population segments				
The goals that follow are based on the following documents: • Baylands Ecosystem Habitat Goals (http://baylandsgoals.org/wp-content/uploads/2015/10/1999sfbaygoals031799.pdf) pp 134, pp 154, pp160, pp 162, pp 168				
Subregional Habitat Recommendations: • Mountain View Area • Coyote Creek Area	**Mountain View** • Restore large areas of tidal marsh and provide a continuous corridor of tidal marsh along the bayshore. • Provide more and wider buffers to tidal marshes and improve management to reduce human intrusion and predators. • Modify and manage two or three complexes of salt ponds, including the pond adjacent to the Dumbarton Bridge, for shorebirds, waterfowl, and post-breeding least terns.	*	*	**Mountain View** Pacific Gas and Electric Company transmission lines and other utility corridors, flood protection considerations, historical land subsidence, freshwater outflow from wastewater treatment facilities, operation and maintenance of salt ponds in absence of

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
	• Enhance the seasonal wetlands and burrowing owl habitat in the Sunnyvale baylands. • Reestablish native vegetation and otherwise enhance the riparian corridor along San Francisquito Creek, Guadalupe River, and other tributary streams. **Coyote Creek** • Restore tidal marsh throughout most of the segment, providing a continuous corridor of tidal marsh along the bayshore. The type of tidal marsh created (salt or brackish) will be dependent on the amount and proximity to local freshwater outflows. Restoration should emphasize reestablishing a natural transition between tidal marsh and adjacent wetlands and upland habitats, as well as transitions between salt and brackish tidal marsh. • Modify and manage a large complex of salt ponds for shorebirds and waterfowl. • Restore or enhance vernal pools in the adjacent undeveloped uplands. • Reestablish native riparian vegetation and otherwise improve the riparian corridor along Coyote Creek. • Manage discharges from the San José treatment plant to limit adverse environmental impacts, especially to tidal salt marsh habitat. Consider using recycled water to augment flows in			salt production, and smooth cordgrass. **Coyote Creek** Pacific Gas and Electric Company transmission lines and other utility corridors, flood protection considerations, historical land subsidence, freshwater outflow from wastewater treatment facilities, operation and maintenance of salt ponds in absence of salt production, and smooth cordgrass.

Goals	Objectives	Research Needs/Data Gaps	Restoration Priorities	Other Conservation Needs or Priorities
	Coyote Creek or for other habitat enhancements.			
The goals that follow are based on the following documents: • South Bay Salt Pond Restoration Project Final EIS/R, 2 Description of Alternatives: (http://www.southbayrestoration.org/pdf_files/SBSP_EIR_Final/2_Alternatives%20Final%20EIS_R.pdf) pp 2-24				
• Enhance numbers of salmonids and juvenile in rearing and foraging habitats relative to NEPA/CEQA baseline numbers	*	• Counts of upstream-migrating salmonids to monitor spawning populations in South Bay streams	•	*
Fall-run Chinook salmon *(Oncorhynchus tshawytscha)*				
The goals that follow are based on the following documents: • South Bay Salt Pond Restoration Project Final EIS/R, 2 Description of Alternatives: (http://www.southbayrestoration.org/pdf_files/SBSP_EIR_Final/2_Alternatives%20Final%20EIS_R.pdf) pp 2-24				
• Enhance numbers of salmonids and juvenile in rearing and foraging habitats relative to NEPA/CEQA baseline numbers	*	• Counts of upstream-migrating salmonids to monitor spawning populations in South Bay streams	*	*

Note:
*Information not provided in given documents

Table I-2 Summary of Baylands Conservation Strategy: Priority Locations

<table>
<tr><th>Objectives</th><th>Research Needs/Data Gaps</th><th>Restoration Priorities</th><th>Other conservation needs or priorities</th></tr>
<tr><td colspan="4">Guadalupe Slough-Warm Springs</td></tr>
<tr><td colspan="4">The objectives that follow are based on the following documents:
• Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California (https://www.fws.gov/sacramento/es/recovery-planning/tidal-marsh/Documents/TMRP_Volume1_RP.pdf) pp 355</td></tr>
<tr><td>• 1.2.1.1 Acquire/protect currently unprotected tidal marsh habitat. (Priority 2)
• 1.2.1.2 Investigate opportunities to acquire/protect lands restorable to tidal marsh. (Priority 2)
• 1.2.2. Acquire/protect currently unprotected high marsh and ecotonal habitat and lands restorable to high marsh and ecotonal habitat for Chloropyron molle ssp. molle, Cirsium hydrophilum var. hydrophilum, California clapper rail, and salt marsh harvest mouse by purchase of fee title or conservation easement. (Priority 1)
• 2.1.5.2 Minimize or avoid over-management of estuarine salinity variation. (Priority 2)
• 2.1.6.1.1.3 Monitor the success of control at sites where non-native Spartina species is managed and the ability of treated sites to support California clapper rails. (Priority 1)
• 2.1.8.2.1 Identify lands adjacent to the Bay Trail and other public access areas where human-related disturbance encourages predation that causes a threat to the California clapper rail and salt marsh harvest mouse. (Priority 2)
• 2.1.8.2.3 Implement and enforce pet restrictions. (Priority 2)
• 2.1.8.2.4 Avoid relocation of nuisance animals in California clapper rail habitat. (Priority 2)</td><td>• 4.2.7.1 Conduct a population viability analysis to determine desirable population sizes for long-term persistence of extant South Bay salt marsh harvest mouse populations. (Priority 2)
• 4.2.7.2 Study use of adjacent habitat, including brackish marsh, by the salt marsh harvest mouse. (Priority 1)
• 4.2.7.3 Study the impact of Spartina alterniflora and its hybrids, and Lepidium latifolium on the salt marsh harvest mouse. (Priority 2)
• 4.2.7.4 Study predation impacts to the salt marsh harvest mouse. (Priority 2)
• 4.3.1 Conduct a salt marsh harvest mouse population genetic analysis to determine:
o the genetic effective population size
o the genetic relationships among presumed populations
o the magnitude of gene exchange between marshes and subpopulations within marshes
o the extent of inbreeding occurring within populations (Priority 1)</td><td>Table III-3: Summary of California Clapper Rail and Salt Marsh Harvest Mouse Recovery Criteria – highlights need by specific habitat complex</td><td>**Noted in objective/action**</td></tr>
</table>

Objectives	Research Needs/Data Gaps	Restoration Priorities	Other conservation needs or priorities
• **2.1.9.2** Manage cattle grazing to minimize impacts to salt marsh harvest mouse, Suisun shrew, and the birds of the high tidal marsh, such as saltmarsh common yellowthroat. (Priority 3) • **2.2.1** Create an interdisciplinary review panel or similar group to coordinate and review the design of tidal marsh restoration projects throughout San Francisco Bay. (Priority 2) • **2.2.3.1** Protect, manage, and monitor large populations and occupied marsh complexes as interim reserves selected to represent the full range of both subspecies of salt marsh harvest mouse. (Priority 1) • **2.2.3.3** Transition from diked wetlands to restored or enhanced tidal marsh habitat, where feasible. (Priority 3)			
• **3.1.1.1** Review existing species survey guidance to determine its adequacy. (Priority 3) • **3.1.1.2** If necessary, revise existing guidance or develop new standardized, scientifically based, and species-specific survey guidance. (Priority 3) • **3.1.2.5.1** Develop certification/training programs for California clapper rail surveyors and survey coordinators. (Priority 3) • **3.1.2.5.2** Conduct annual California clapper rail call counts during breeding season. (Priority 2) • **3.1.2.5.3** Monitor adult California clapper rail survival and mortality of adults, chicks, and eggs due to predation. (Priority 2) • **3.1.2.5.4** Develop and maintain a database to track results from annual California clapper rail monitoring results. (Priority 2) • **3.1.2.5.5** Examine the methodology used for call count surveys in by cross validating surveys (using double	• **4.2.6.1** Conduct a population viability analysis of the California clapper rail. (Priority 1) • **4.2.6.2** Study effects of recent non-native *Spartina* species treatment on California clapper rail movement within the ecosystem. (Priority 1) • **4.2.6.3** Conduct diet analyses on California clapper rail as a tool to understanding habitat use. (Priority 2) • **4.4.3** Study the impacts of large-volume, human-caused, freshwater discharges into tidal marshes. (Priority 2) • **4.4.4** Investigate the effects of salinity fluctuation and altered tidal datum on species covered in this recovery plan. (Priority 2) • **4.4.5** Study the time lag between habitat restoration and recolonization by species covered in this recovery plan. (Priority 2)	Table III-3: Summary of California Clapper Rail and Salt Marsh Harvest Mouse Recovery Criteria	**Noted in objective/action**

Objectives	Research Needs/Data Gaps	Restoration Priorities	Other conservation needs or priorities
observer methods) with movement studies recommended in **Action 4.2.6.2** (Priority 3) • **3.1.2.6** Monitor for salt marsh harvest mouse. (Priority 2)	• **4.4.6** Conduct research on the physical processes (geomorphic and hydrologic) that maintain the structure and function of suitable habitats for tidal marsh species. (Priority 2) • **4.4.7** Study the effects of global climate change and resulting sea level rise on tidal marsh ecosystems. (Priority 1) • **4.4.8** Conduct research on management conflicts between tidal marsh species. (Priority 2) • **4.5.2.1** Conduct research into mercury exposure pathways for California clapper rails and potential means to interrupt those pathways. (Priority 2) • **4.5.2.2** Conduct other necessary research on bioaccumulation and effects, including reproductive success and development, of toxic estuarine contaminants on tidal marsh species. (Priority 2) • **4.5.2.3** Apply results of research in **Action 4.5.2.2** to re-evaluate suitability of delisting criterion E/5 for the California clapper rail and revise, if appropriate. (Priority 3) • **4.5.2.4** Apply results of research in **Actions 4.2.4.2.**1 and **4.2.4.2.2** to sediment and water quality standards to protect sensitive wildlife of the San Francisco Bay Estuary. (Priority 3) • **4.5.2.5** Conduct studies to establish contaminant levels in biosentinels that are “acceptable” or “not acceptable”, then measure compounds in these biosentinels directly or via a non-invasive surrogate, such as feathers, if possible. (Priority 1)		

Objectives	Research Needs/Data Gaps	Restoration Priorities	Other conservation needs or priorities
	• **4.7** Establish research protocols, where necessary, and as determined by the RIT, described below. (Priority 3)For example, establish protocols for handling sick, injured, oiled, and dead California clapper rails or salvaged eggs. • **4.8** Conduct additional research identified as necessary by the Recovery Implementation Team that address changing conditions and are supportive of highest priority recovery tasks. (Priority 2) • **4.9** Apply the results of all studies to conservation and recovery efforts. (Priority 2)		
Guadalupe Slough-Warm Springs			
The objectives that follow are based on the following documents: • San Francisco Bay Subtidal Habitat Goals Report (http://www.sfbaysubtidal.org/PDFS/Full%20Report.pdf) pp 70, pp 90-91, pp 112			
• Promote sand beach creation, restoration, and replenishment projects that use clean, maintenance-dredged sand where possible and in areas where sand is deposited, such as at the river delta interface • Consider incorporating living shoreline techniques to retain sand, either from natural deposition or from sand replenishment • Encourage removal of artificial structures that have negative impacts on soft bottom habitat function • Where appropriate, remove creosote pilings from intertidal and subtidal habitats of the bay, with a focus on those areas that have high concentrations of individual pilings or piling complexes and are within current and historic spawning grounds for herring • Where appropriate, remove shoreline stabilization structures and riprap from the bay that are no longer	*	*	*

Objectives	Research Needs/Data Gaps	Restoration Priorities	Other conservation needs or priorities
providing protection or may be contributing to coastal erosion • Promote pilot projects to remove artificial structures and creosote pilings at targeted sites in combination with a living shoreline restoration design that will use natural bioengineering techniques (such as native oyster reefs, stone sills, and eelgrass plantings) to replace lost habitat structure • Implement a program of adaptive management with phased restoration. Periodic reviews will determine whether the knowledge is adequate to support proceeding to the next phase. Provisionally the targets would be to increase native oyster populations within 10 acres of subtidal area within 5 years, within 400 acres of subtidal area within 10 years, and within 8,000 acres of subtidal area within a 50-year time frame • Incorporate native oyster restoration into other regional restoration and shoreline protection projects and initiatives			
Don Edwards National Wildlife Refuge			
The objectives that follow are based on the following documents: • South Bay Salt Pond Restoration Project Final EIS (http://www.southbayrestoration.org/pdf_files/SBSP_EIR_Final/2_Alternatives%20Final%20EIS_R.pdf) pp 2-24			
• Contribute to the recovery of the South Bay subspecies of the salt marsh harvest mouse	• Monitoring not expected to begin for 5-10 years after pickleweed establishment in 300 acres or more • Counts of upstream-migrating salmonids to monitor spawning populations in South Bay streams	• Meet recovery plan criteria for salt marsh harvest mouse habitat within the South Bay Salt Pond Restoration Project Area • 75% of viable habitat areas within each large marsh complex with a capture	*

Objectives	Research Needs/Data Gaps	Restoration Priorities	Other conservation needs or priorities
		efficiency level of 5.0 or better in five consecutive years •	
Coyote Creek			
The objectives that follow are based on the following documents: • Baylands Ecosystem Habitat Goals (http://baylandsgoals.org/wp-content/uploads/2015/10/1999sfbaygoals031799.pdf) pp 136, pp 146, pp 162, pp 164			
• Restore tidal marsh throughout most of the segment, providing a continuous corridor of tidal marsh along the bayshore. The type of tidal marsh created (salt or brackish) will be dependent on the amount and proximity to local freshwater outflows. Restoration should emphasize reestablishing a natural transition between tidal marsh and adjacent wetlands and upland habitats, as well as transitions between salt and brackish tidal marsh. • Protect existing muted tidal wetland for the salt marsh harvest mouse as insurance against fully tidal wetland being lost as a result of sea-level rise • Modify and manage a large complex of salt ponds for shorebirds and waterfowl. • Restore or enhance vernal pools in the adjacent undeveloped uplands. • Reestablish native riparian vegetation and otherwise improve the riparian corridor along Coyote Creek. • Manage discharges from the San José treatment plant to limit adverse environmental impacts, especially to tidal salt marsh habitat. Consider using recycled water to augment flows in Coyote Creek or for other habitat enhancements.	*	*	Pacific Gas and Electric Company transmission lines and other utility corridors, flood protection considerations, historical land subsidence, freshwater outflow from wastewater treatment facilities, operation and maintenance of salt ponds in absence of salt production, and smooth cordgrass.
Mountain View			

Objectives	Research Needs/Data Gaps	Restoration Priorities	Other conservation needs or priorities
The objectives that follow are based on the following documents: • Baylands Ecosystem Habitat Goals (http://baylandsgoals.org/wp-content/uploads/2015/10/1999sfbaygoals031799.pdf) pp 134, pp 154, pp 160, pp 162, pp 168			
• Restore large areas of tidal marsh and provide a continuous corridor of tidal marsh along the bayshore. • Provide more and wider buffers to tidal marshes and improve management to reduce human intrusion and predators. • Modify and manage two or three complexes of salt ponds, including the pond adjacent to the Dumbarton Bridge, for shorebirds, waterfowl, and post-breeding least terns. • Enhance the seasonal wetlands and burrowing owl habitat in the Sunnyvale baylands. • Reestablish native vegetation and otherwise enhance the riparian corridor along San Francisquito Creek, Guadalupe River, and other tributary streams.	*	*	Pacific Gas and Electric Company transmission lines and other utility corridors, flood protection considerations, historical land subsidence, freshwater outflow from wastewater treatment facilities, operation and maintenance of salt ponds in absence of salt production, and smooth cordgrass.

Note:

* Information not provided in given documents

Amendment 1
Consistent Metrics

This amendment to the Santa Clara County Regional Conservation Investment Strategy (SCCRCIS) was developed to meet the provisions of the RCIS statute and guidelines (CDFW 2018) that a RCIS provide consistent metrics. It describes the purpose of the metrics and how they can be used in developing MCAs and then lists the metrics. The amendment was approved by CDFW in November 2020.

Background

Measurable objectives in the SCCRCIS include metrics for tracking progress towards achieving the SCCRCIS' goals and objectives. In describing objectives, metrics are provided with the intent of measuring, in a consistent way, the net change, from habitat restoration actions, on the habitat area and habitat quality. When implementing conservation actions and habitat enhancement actions that include habitat restoration, an MCA Sponsor shall select, and submit for CDFW's approval, one or more appropriate metric(s) from those outlined below to measure the net change in habitat area and habitat quality.

If an MCA Sponsor determines that an alternative metric, not listed below, is more fitting for an action or objective, the MCA Sponsor may make a written request to the Santa Clara Valley Open Space Authority (Authority), as the SCRCIS Proponent, and CDFW, which approved the SCCRCIS, to consider approving that alternative metric instead of, or in addition to, one or more of the metrics below. CDFW will consider the proposed alternative metric and the Authority's recommendation, if any, when determining whether to approve the alternative metric. The MCA Sponsors may include additional measures and performance standards for assessing habitat quality in an MCA, consistent with the MCA Guidelines and with approval by CDFW.

Once approved, the metrics designated in an MCA must be used for both the baseline and subsequent measurements of habitat area and habitat quality. The MCA Sponsor must then report on relevant RCIS metrics for corresponding conservation actions and habitat enhancement actions identified in the approved MCA.

If an approved metric turns out to be faulty or problematic, the MCA Sponsor may make a written request to the Authority and CDFW to consider approving a different metric instead of, or in addition to, the approved metric(s), as set forth above. The determination to approve will be based, in part, on whether that new metric can be compared with the original baseline data in a reasonable way to compare the change in habitat area or habitat quality, as applicable.

Metrics

The following metrics are acceptable for measuring the net change in habitat area and habitat quality resulting from habitat restoration actions implemented as part of the SCCRCIS:

- Acreage

- Linear feet
- Percent cover (native vs. nonnative species)
- Native species diversity
- Number of individuals
- Number of populations
- Gene pool / genetic diversity
- Evidence of presence and abundance (presence/absence, # of nests, calls, scat, etc.)
- Habitat structure (number of canopy layers; percent cover; snags, etc.)
- Vigor index (health of plant on a scale of 1-4)
- Distribution of key resources (e.g., nesting trees, ponds, host plants) (number per acre)
- Inundation duration (consecutive days)
- Water depth (feet)
- Stream flow (cubic feet per second)
- Water temperature and chemical composition (dissolved oxygen, etc.)
- Stream substrate composition (percent cover; gravel size; etc.)
- Stream characterization (pool, riffle, run; length and width)