Chapter 3
Conservation Strategy

3.1 Overview

The conservation strategy was designed to meet the requirements of the California Department of Fish and Wildlife's (CDFW's) *Regional Conservation Investment Strategies Program Guidelines* (Program Guidelines) (California Department of Fish and Wildlife 2017). This chapter describes how conservation opportunities have been identified and prioritized in the regional conservation investment strategy (RCIS) area. This Santa Clara County RCIS uses the best available science to identify conservation goals and objectives, conservation 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 in the RCIS area. 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 actions, and conservation priorities. All four of these elements are presented in the conservation strategy for each focal species (Ta 3.6, *Conservation Strategy for Focal Species*) and the conservation strategy for other conservation elements[1] (Section 3.7, *Conservation Strategy for Other Conservation Elements*). The conservation strategy provides conservation 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 habitat 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.

[1] A conservation element is an element with ecological functions in an RCIS, including focal species and their habitats, wildlife corridors and linkages, and other natural resources.

- Protect land cover types that are uncommon in the RCIS area to maintain the diversity of natural communities and ecological processes representative of the RCIS area.

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 monitoring and adaptive management (Section 3.9, *Monitoring and Adaptive Management Framework*), which will be used for developing monitoring and adaptive management 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, described 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 in the RCIS area, and address the pressures on focal species and important conservation elements identified in Section 2.7, *Pressures and Stressors on Focal Species and Other Conservation Elements*. Each conservation goal is supported by several conservation objectives. Conservation objectives are concise, measurable statements of the target outcome for each focal species and other conservation elements. Quantitative conservation objectives focus on protecting unprotected land (Section 3.3, *Conservation Gap Analysis and Conservation Targets*) and enhancing land that is already protected in the RCIS area. 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, conservation objectives are quantitative and include a description of how they provide for adaptation opportunities to offset the effects of climate change. Conservation objectives are set such that, if implemented, they would accomplish the conservation goals as written. All conservation goals and objectives will be achieved through the implementation of the conservation actions.[2]

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

[2] 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.

two-digit codes so that they can be easily identified and tracked by those implementing conservation actions.

3.2.2 Conservation Actions and Priorities

This Santa Clara County RCIS's conservation actions and conservation priorities are the strategies that will be employed to accomplish the conservation goals and objectives. *Conservation actions* are defined by the Program Guidelines as "actions that would preserve or restore ecological resources, including habitat, natural communities, ecological processes, and wildlife corridors, to protect those resources permanently, and would provide for their perpetual management." A *conservation priority* is defined by the Program Guidelines as an area that is "ranked based on its importance for contributing to the conservation and recovery of a focal species and their habitats, or other conservation elements" (California Department of Fish and Wildlife 2017). The conservation priorities are used to highlight important locations where conservation actions should occur in the next 10 years. The conservation actions and priorities are not limited to those identified in this RCIS, as additional actions and new priorities will likely become apparent with new information and a changing future environment.

3.2.2.1 Criteria for Identifying Conservation Priorities

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.

The primary data source used to determine conservation priority areas for focal species are the species habitat models (Appendix H, *Focal Species Models*). Species habitat models are based on biotic and abiotic factors (parameters) that, when combined, represent where species are more likely to occur based on current understanding of their life history and ecology. Conservation priorities focus on focal species' habitats that are generally more limited, or limiting to a species' persistence, if a species uses multiple habitats during its life cycle. For example, aquatic breeding habitat was prioritized over upland habitat for California tiger salamander because in nearly all cases, aquatic breeding habitat, not upland aestivation or movement habitat, limits whether that species persists in an area. Similarly, primary habitat (as defined for some plant species) was prioritized over secondary habitat (Section 2.3.5.2, *Habitat Distribution Models*).

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 2.3.5.3, *Focal Species Profiles*).
- Designated critical habitat (for focal species that have designated critical habitat) (Section 2.3.5.3, *Focal Species Profiles*).
- Recovery Areas (for focal species which are also federally listed) (Section 2.3.5.3, *Focal Species Profiles*).
- Local knowledge of priority restoration and enhancement actions (Smith J. pers. comm. 2017, Calnan A. pers. comm. 2017).
- Locations of rare or unique land cover types (Section 2.5.3, *Unique Land Cover Types*).

- Locations of wildlife linkages (Section 2.5.1, *Habitat Connectivity*).
- Adjacency to protected areas (Section 2.3.1, *Protected Areas*).
- Locations that would or are expected to promote climate resilience (California Department of Fish and Wildlife 2017, ICF International 2012).

The focal species conservation 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 and priorities identified in this RCIS. 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 already addressed in this RCIS (e.g., landscape linkages and other conservation elements) to provide additional context to the conservation actions and priorities in this RCIS. Both the *Bay Area Greenprint*[3] (Bay Area Greenprint) (Bay Area Greenprint 2017) and the *Santa Clara Valley Greenprint* (Santa Clara Greenprint) (Santa Clara Valley Open Space Authority 2014) are online tools that reveals 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. 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.

3.2.3 Geographic Units of Conservation

The RCIS area was subdivided into 15 discrete conservation planning units (CPUs) where conservation 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 may be implemented without identifying specific parcels. This approach focuses the conservation 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 conduct 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 2.3.3, *Watersheds*). Watershed boundaries were selected because these boundaries are also used by the Habitat Plan (ICF International 2012) to organize its conservation strategy[4] 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, some have only small portions in the RCIS area. In such cases, these small portions of HUC-10 watersheds were merged with neighboring watersheds so that all CPUs were similarly and reasonably sized. The 15 CPUs are named after the majority watershed in that part of 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. Table 2-2 provides information on the size of these watersheds and the major creeks that run through these watersheds.

[3] https://www.bayareagreenprint.org/

[4] In the Santa Clara Valley Habitat Plan the conservation units are called "conservation analysis zones."

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 necessary level of protection needed for each focal species over the long term, to ensure population persistence even when species are subjected to environmental stressors such as climate change. A conservation gap analysis was conducted to identify the amount of each land cover type and focal species' habitat (i.e., focal species' habitat protection goal) that would need to be permanently protected to help facilitate the long-term sustainability of focal species in the RCIS area. 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 objectives 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 2.3.5.2, *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 2.3.4, *Natural Communities and Land Cover*, and Figures 2-14 through 2-21).
- Species habitat distribution models (Section 2.3.5, *Focal Species*, and Appendix H, *Focal Species Habitat Models*).
- Protected land (Section 2.3.1, *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, *Existing 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 2.3.5.2, *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 setting quantitative conservation targets for each land cover type. 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*).

Conservation targets were set for each land cover type, generally consistent with the approach used by the Conservation Lands Network for setting protection goals (Bay Area Open Space Council 2011). The conservation targets identify the amount of a land cover type that should be protected in the RCIS area, as a percentage of the total amount of that land cover type 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.[5]

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.
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 nonnative land cover types that support focal species. Conservation Lands Network 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 preservation needed in this RCIS area 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.[6]
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 acreage requirements were added to the RCIS gap analysis consistent with the crosswalk of land cover types in Table 2-3a, *Crosswalk of Santa Clara County RCIS Terrestrial Land Cover Types to other State and Local Classification Systems* and Table 2-3b, *Crosswalk of Santa Clara County RCIS Wetland and Bayland Land Cover Types to other State and Local Classification Systems*.
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 the conservation targets for each land cover type.

[5] 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.

[6] Many lands are owned by public agencies or private entities for conservation or recreation purposes, but are not necessarily protected by a conservation easement.

Table 3-1. Conservation Targets and Conservation Gaps in Acres for Each Land Cover Type in the RCIS Area[a]

Land Cover Type	Total Land Cover	Conservation Target (Percent of Total in RCIS Area)	Conservation Target	Currently Protected[c]	Habitat Plan Protection	Conservation Gap[c]
Grassland						
California annual grassland	181,300	75%	136,000	34,300 (19%)	13,000	88,700 (65%)[b]
Serpentine grassland[a]	14,400	90%	13,000	5,600 (39%)	4,000	7,400 (51%)
Serpentine rock outcrops[a]	268	90%	241	108 (40%)	120	133 (50%)
Barren/Rock	1,800	50%	900	81 (5%)	10	828 (45%)
Shrublands						
Northern mixed chaparral/chamise chaparral	99,600	75%	74,700	34,700 (35%)	400	39,600(53%)
Serpentine chaparral[a]	6,100	90%	5,500	2,100 (34%)	700	2,600 (47%)
Northern coastal scrub/Diablan sage scrub[a]	15,300	90%	13,800	5,000 (33%)	1,400	6,400 (46%)
Woodland						
Blue oak woodland	38,000	75%	29,000	13,200 (38%)	1,100	14,200 (48%)
Valley oak forest/woodland[a]	15,900	90%	14,300	7,000 (44%)	1,700	5, 600 (46%)
Coast live oak forest and woodland	74,100	75%	55,600	21,400 (29%)	2,900	31,300 (57%)
Mixed oak woodland and forest	98,200	75%	73,700	49,600 (50%)	7,100	17,000 (23%)
Montane hardwood[a]	20,400	90%	18,400	9,600 (47%)	--	8,800 (48%)
Serpentine hardwood[a]	3,700	90%	3,300	1,400 (38%)	--	1,900 (58%)
Conifer Forest						
Redwood forest[a]	15,000	75%	11,300	5,500 (37%)	10	5,800 (51%)
Douglas fir forest[a]	15,600	90%	14,000	8,400 (54%)	20	5,600 (340%)
Serpentine conifer[a]	754	90%	679	227 (30%)	--	(60%)
Coulter pine forest[a]	198	90%	178	0	--	178 (90%)
Knobcone pine forest[a]	709	90%	638	153 (22%)	N/A	485 (76%)
Ponderosa pine woodland	37,600	75%	28,200	27,000 (72%)	80[d]	1,120(4%)

Land Cover Type	Total Land Cover	Conservation Target (Percent of Total in RCIS Area)	Conservation Target	Currently Protected[c]	Habitat Plan Protection	Conservation Gap[c]
Riparian Woodland						
Central coast riparian forest[a]	3,800	90%	3,400	1,300 (33%)	578[e]	1,500 (44%)
Sycamore alluvial woodland[a]	4,100	90%	3,700	865 (21%)	40	2800 (76%)
Serpentine riparian[a]	268	90%	241	17 (6%)	--	224 (93%)
Baylands						
Shallow bay	629	50%	315	75 (12%)	--	240 (76%)
Tidal bay flat[a]	2,500	90%	2,300	193 (8%)	--	2,085 (90%)
Tidal unnatural	8,100	90%	7,300	6,200 (77%)	--	1,100 (15%)
Tidal vegetation[a]	2,800	90%	2,500	1,700 (62%)	--	787 (31%)
Wetland and Pond						
Perennial freshwater marsh[a]	1,100	90%	990	564 (50%)	50	403 (41%)
Seasonal wetland[a]	591	90%	532	400 (68%)	30	102 (26%)
Seep/Spring (nonserpentine)[a]	120	90%	108	41 (34%)	--	67 (52%)
Seep/Spring (serpentine)[a]	40	90%	36	11 (28%)	10	15 (42%)
Pond[a]	3,000	90%	2,700	611 (20%)	104	2,000 (74%)
Stream (miles)	2,900	90%	2,600	980 (34%)	100	1,500 (58%)
Reservoir	5,500	0%	0	4600 (83%)	N/A	0
Cultivated Agriculture						
Cultivated-undetermined	1,600	50%	800	246 (16%)	--	545 (68%)
Developed agriculture	1,900	0%	0	12	N/A	0
Grain, row-crops, disked	51,300	50%	25,700	3,800 (7%)	N/A	21,900 (85%)
Orchard	4,000	0%	0	79 (2%)	N/A	0
Vineyard	1,600	0%	0	0.4 (<0.1%)	N/A	0

Land Cover Type	Total Land Cover	Conservation Target (Percent of Total in RCIS Area)	Conservation Target	Currently Protected[c]	Habitat Plan Protection	Conservation Gap[c]
Urban						
Urban	189,700	0%	0	3,400(2%)	N/A	0
Rural residential	12,400	0%	0	171 (1%)	N/A	0
Ornamental woodland	216	0%	0	66 (31%)	N/A	0

[a] Unique land cover type (Section 2.5.3, *Unique Land Cover Types*).

[b] Example calculation: 181,300 *.75=136,000-34,300-13,000=88,700 (with rounding)

[c] Percentages in the Currently Protected column are of the total land cover while percentages in the Conservation Gap column are of the conservation target.

[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.

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 proportion 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 2.3.5.2, *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 total amount of modeled habitat in the RCIS area for each focal species with modeled habitat. These amounts are identified in the *Total Modeled Habitat* column in Table 3-2.
2. Calculate in GIS the acres of each land cover type that make up the species habitat model.
3. Calculate in GIS the amount of modeled habitat, broken down by land cover type, already protected for each focal species. These amounts are identified in the *Currently Protected* column in Table 3-2.
4. Apply the protection goals (percentages) for each land cover type (Table 3-1) to the land cover types that make up each focal species model.
5. Determine the conservation target for each land cover type that makes up modeled habitat for each focal species. These amounts are identified in the *Conservation Target* column in Table 3-2.
6. Determine how many acres (or stream miles, for steelhead) are protected, by land cover type, within the modeled habitat for each focal species, and how many additional acres (or stream miles) are needed to meet the conservation target.
7. For each focal species, sum the conservation gaps (in acres or stream miles) for each land cover type to determine the total conservation gap for each focal species, by modeled habitat type (e.g., breeding, upland, dispersal, primary, secondary).
8. 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 did not align precisely between the two plans, the modeled habitat types from the Habitat Plan and RCIS were crosswalked according to Table 3-3.
9. 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 unprotected habitat that needs to be protected to meet the conservation target for each focal species, as show 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[a]; percentages are of total modeled habitat in RCIS area)

Modeled Habitat for Focal Species[b]	Total Modeled Habitat	Currently Protected	Conservation Target	Habitat Plan Protection[e]	Conservation Gap
Central California Coast steelhead[c,d]	91 miles	37 miles (41%)	82 miles (90%)	34 miles[f]	11 miles (13%)
South Central California Coast steelhead[c,d]	122 miles	12 miles (10%)	110 miles (90%)	66 miles[f]	32 miles (29%)
California tiger salamander	700,800	228,900 (33%)	522,000 (74%)	30,150	263,000 (50%)
Breeding habitat	2,333	625 (27%)	2,100 (90%)	150	1,400 (67%)
Occupied breeding	1,030	424 (41%)	927 (90%)	--	503 (66%)
Upland habitat	550,500	164,300 (30%)	412,300 (75%)	30,000	218,000 (53%)
Occupied upland	147,000	63,500 (43%)	106,500 (69%)	--	43,000 (40%)
Foothill yellow-legged frog	48,300	19,800 (41%)	38,000 (79%)	80	18,100 (48%)
Breeding/Foraging	32,500	12,700 (39%)	25,300 (78%)	30	12,600 (50%)
Low-use habitat	15,900	7,100 (45%)	12,700 (80%)	50	5,500 (43%)
California red-legged frog	709,600	232,600 (33%)	529,000 (75%)	31,300	265,100 (50%)
Breeding habitat	5,400	1,800 (33%)	4,800 (90%)	1,300	1,800 (38%)
Dispersal habitat	678,600	222,000 (33%)	504,600 (74%)	30,000	252,600 (55%)
Refugia habitat	25,600	8,800 (34%)	19,500 (76%)	--	10,700 (59%)
Tricolored blackbird	496,500	138,700 (28%)	359,500(72%)	19,000	201,800 (56%)
Breeding habitat	239,300	66,700 (28%)	175,800 (73%)	1,000	108,100 (61%)
Foraging habitat	257,200	72,000 (28%)	183,700 (71%)	18,000	93,700 (51%)
Burrowing owl	143,200	25,700 (18%)	101,100 (71%)	22,300	53,100(51%)
Breeding/Overwintering habitat	42,000	2,700 (6%)	26,800(44%)	5,300	18,800(70%)
Overwintering habitat	101,200	23,000 (23%)	74,300 (74%)	17,000	34,300 (31%)
Swainson's hawk	71,600	3,900 (5%)	36,800 (51%)	N/A	32,900 (89%)
Foraging habitat	69,900	3,400 (5%)	35,300(50%)	N/A	31,900 (90%)
Nesting habitat	1,700	525 (30%)	1,600 (90%)	N/A	1,000 (63%)
San Joaquin kit fox	107,800	7,200 (7%)	59,900 (55%)	4,100	48,600 (81%)
Movement/Foraging	106,100	7,200 (7%)	59,000 (56%)	4,000	47,800 (81%)
Low-use habitat	1,700	0	837 (50%)	100	737 (88%)
Congdon's spikeweed	4,900	702	2,400 (50%)	N/A	1,700 (71%)
Mount Hamilton thistle	640	235 (37%)	627 (98%)	150	242 (39%)

Modeled Habitat for Focal Species[b]	Total Modeled Habitat	Currently Protected	Conservation Target	Habitat Plan Protection[e]	Conservation Gap
Occupied habitat	504	196 (39%)	504 (100%)	150	158 (31%)
Suitable habitat	136	40 (29%)	122 (90%)	--	83 (68%)
Fragrant fritillary	135,400	50,200 (52%)	104,000(77%)	23,000	30,800(29%)
Primary habitat	12,700	5,200 (41%)	11,500 (91%)	3,000	3,300 (29%)
Secondary habitat	122,700	45,000 (53%)	92,500 (75%)	20,000	27,500 (30%)
Loma Prieta hoita	55,200	19,400 (35%)	42,400 (77%)	10,000	13,000 (31%)
Primary habitat	41,600	13,300 (32%)	31,600 (76%)	9,000	9,200 (29%)
Secondary habitat	13,700	6,100 (45%)	10,900 (80%)	1,000	3,800 (35%)
Smooth lessingia	14,500	5,700 (39%)	13,100 (90%)	4,000	3,400 (26%)
Most beautiful jewelflower	22,500	6,200 (28%)	19,600 (87%)	4,000	9,300 (48%)
Primary habitat	20,700	6,100 (45%)	18,600 (90%)	4,000	8,500 (46%)
Secondary habitat	1,800	108 (6%)	909 (51%)	--	828 (91%)

[a] All numbers greater than 1,000 are rounded to the nearest 100 because the species habitat models are based on multiple data sources and represent an estimate of suitable habitat on a landscape scale. All numbers less than 1,000 have not been rounded.

[b] Species habitat models were not created for mountain lion, Tracy's eriastrum, or rock sanicle.

[c] 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.

[d] Stream miles.

[e] ---Table 5-17 of the Habitat Plan does not have a protection goal for this species or habitat types.

N/A This species is not covered by the Habitat Plan.

[f] The amount of unprotected modeled habitat for steelhead for the RCIS that falls within the Habitat Plan boundary.

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
Dispersal habitat	Secondary habitat
Tricolored blackbird	
Breeding habitat	Primary habitat
Foraging habitat	Secondary habitat
Burrowing owl	
Breeding/overwintering habitat	Occupied and potential nesting
Overwintering habitat	Overwintering habitat
San Joaquin kit fox	
Movement/foraging	Secondary habitat
Low-use habitat	Secondary habitat (low-use)
Mount Hamilton thistle	
Occupied habitat	Primary habitat
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	Primary 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 this 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 2.7.3, *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 targets 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 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) in the RCIS area. 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). In addition, the conservation strategy will adaptively allow for adaptations to sea-level rise (Appendix I, *Summary of Bayland Conservation Strategies*).

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, and conservation 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 and 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 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 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 all 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. 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 4.3.1.1, *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 the protection of occupied habitat to protect existing populations of focal species. The conservation strategy also emphasizes the protection and enhancement of focal species' habitat in the RCIS area, as identified by the focal species habitat models (Section 3.3, *Conservation Gap Analysis and Other 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 by protecting and enhancing stream reaches and facilitating migration to spawning habitat in the RCIS area.

Objective 1.1: Reduce the primary threats of habitat loss, degradation, and fragmentation by acquiring the additional stream habitat needed to meet the conservation target for Central California Coast steelhead (11 miles) and South Central California Coast steelhead (32 miles) within the RCIS area (Figure H-1, Appendix H, Focal Species Habitat Models).

- **Conservation 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 up to 37 miles of fish-bearing streams for Central California Coast steelhead and 12 miles of fish-bearing streams for South Central California Coast steelhead on protected land in the RCIS area.

- **Conservation Action CCC-2.** Survey streams identified as habitat, potential habitat, or fish scarce[7] for steelhead in Figure H-1, Appendix H, Focal Species Habitat Models, to identify restoration and enhancement opportunities.
- **Conservation Action CCC-3.** Conduct reconnaissance-level surveys on streams in the RCIS area where additional data are needed, as indicated in Figure H-1, Appendix H, Focal Species Habitat Models, as "no data/extent unknown," to evaluate the distribution of steelhead and assess habitat quality.
- **Conservation Action CCC-4.** Remove or modify barriers to stream passage by steelhead and other aquatic species and reduce stream channelization to enable access to a wide variety of streams and habitats in the RCIS area.
- **Conservation Action CCC-5.** Conduct enhancement and restoration projects in stream habitat identified as steelhead habitat in Figure H-1, Appendix H, *Focal Species Habitat Models*.

[7] Habitats that are dry during summer and fall but may serve as migration routes for steelhead.

- **Conservation Action CCC-6.** Assess the condition of stream habitat mapped as estuarine (Figure H-1, Appendix H, *Focal Species Habitat Models*), and restore where needed through control of fill, waste discharges, instream flows, and riparian buffers.
- **Conservation Action CCC-7.** Design all new road crossings and crossing upgrades in areas of modeled steelhead habitat in adherence to the National Marine Fisheries Service Anadromous Salmonid Passage Facility criteria and guidelines (National Marine Fisheries Service 2011), where feasible.
- **Conservation Action CCC-8.** Work with local flood control agencies (i.e., the Santa Clara Valley Water District and San Benito County 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, Lllagas, and Pacheco Water District) in the RCIS area.
- **Conservation Action CCC-9.** Work with private and public landowners to minimize instream mining in steelhead habitat in the RCIS area and increase the complexity of stream resources (e.g., woody debris) within the RCIS area.
- **Conservation Action CCC-10.** Evaluate, and, where appropriate, increase the complexity of instream habitat, including spawning substrate and instream woody material.
- **Conservation Action CCC-11.** Create, restore, and enhance riparian vegetation in stream reaches that support steelhead habitat.

3.6.1.2 Conservation Priorities

Prioritize conservation 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 and National Marine Fisheries Service 2016).

- For South Central California coast steelhead, all populations in the Pajaro River watershed.
- For Central California Coast steelhead, all populations in the San Francisquito Creek, Guadalupe River, Stevens Creek, and Coyote Creek.

Prioritize conservation actions on streams labeled as estuarine on Figure H-1, Appendix H, *Focal Species Habitat Models*, in the San Francisco Bay CPU to protect, enhance, and restore important bayland habitat for steelhead. Partner with the San Francisco Bay National Wildlife Refuge, when appropriate.

Prioritize enhancement projects to address the following major impediments and habitat conditions for steelhead in the RCIS area (Smith, J. pers. comm. 2017).

- Stevens Creek: Address Fremont Drop and fish ladder barrier, which is tall and narrow and becomes clogged with debris because of sediment buildup.
- Coyote Creek: 1) Address stream crossing with apron and culvert barrier at Singleton Road (slightly upstream of Capitol Expressway); 2) address largemouth and spotted bass in and increased water temperatures released from Ogier Ponds (e.g., by taking ponds off-channel); 3) add spawning gravels to the reach nearest Anderson Reservoir; 4) restore habitat complexity for up to 5 miles below Anderson Dam; and 5) remove barriers between McKee Road and Metcalf Road.

- Uvas Creek: 1) Address trestle apron at the Southern Pacific tracks at Bolsa Road; 2) address right (west) bank tributary to Uvas Creek, which could benefit from increased stream flows via a small pipeline that could capture stream flows from Uvas Reservoir; and 3) modify or remove dam and fish ladder on Little Arthur Creek.
- Alum Rock Park: Address the small (1 meter) 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.
- Pajaro River: Restore the river's riparian corridor and improve fish habitat on the north side of California State Route (SR) 25.
- Millers Canal, San Felipe Lake, and Pacheco Creek: Improve steelhead habitat through restoration; replace the old and poorly functioning fish ladder.
- 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).

3.6.1.3 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. All of 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. If fish are in the stream system they will have more places to go to find adequate habitat to carry out their life cycle. Specific actions such as riparian restoration along fish-bearing streams will provide shade, helping to moderate water temperatures even under scenarios where the temperature is warmer than in the past.

3.6.2 California Tiger Salamander

3.6.2.1 Conservation Goals and Objectives

Goal 2. Increase California tiger salamander populations in the RCIS area through protection, restoration, and enhancement of habitat, and maintain native genetic structure in the population (U.S. Fish and Wildlife Service 2017).

Objective 2-1: Protect known breeding locations of California tiger salamander and allow for expansion of metapopulations by protecting suitable breeding habitat in the RCIS area.

- **Conservation 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: Reduce the threat of habitat loss by acquiring the additional habitat needed to meet this RCIS's conservation targets, including an additional 503 acres of occupied breeding habitat, 43,000 acres of occupied upland habitat, 1,400 acres of breeding habitat, and 218,000 acres of upland habitat (Figure H-2, Appendix H, *Focal Species Habitat Models*).

- **Conservation Action CTS -2.** Acquire unprotected parcels containing California tiger salamander habitat through fee title purchase or conservation easement.

Objective 2-3: Enhance California tiger salamander habitat on protected land in the RCIS area (228,870 acres).

- **Conservation 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.
- **Conservation 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.
- **Conservation Action CTS-5.** Remove exotic wildlife species such as bullfrogs, mosquitofish, other nonnative predatory fish, and nonnative turtles and salamanders.
- **Conservation Action CTS-6.** Cease the use of rodenticides on protected lands, particularly in grasslands, to maintain a source of burrows for 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).

Objective 2-4: Restore or create California tiger salamander breeding and upland habitat on protected land in the RCIS area.

- **Conservation Action CTS-8.** Conduct surveys in suitable habitat to identify opportunities for habitat protection, restoration, and/or creation.
- **Conservation Action CTS-9.** If it is established that livestock are negatively impacting habitat for California tiger salamander, 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.
- **Conservation Action CTS-10.** Plant native emergent vegetation around the perimeter of ponds and wetlands.
- **Conservation Action CTS-11.** Improve the hydroperiod and water quality of natural ponds and stock ponds for California tiger salamander by clearing vegetation, repairing eroding dams and spillways, and removing sediment, where appropriate (Ford et al. 2013).
- **Conservation Action CTS-12.** Install woody debris around perimeter and in submerged banks of ponds and wetlands to create basking habitat and cover for native amphibians and turtles. Materials imported from outside of the watershed shall be treated for chytrid and other potential pathogens prior to installation.

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.

- **Conservation Action CTS-13.** Monitor ponds to assess the presence of hybrid tiger salamanders.
- **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 (U.S. Fish and Wildlife 2017).
- **Conservation Action CTS-15.** Control hybrid California tiger salamanders in ponds where levels of genetic introgression of invasive barred tiger salamander genes meets or exceeds levels that warrant control. Control efforts may include removal of hybrids, drying ponds, and other wildlife agency-approved methods.
- **Conservation Action CTS-16.** Reduce impacts from hybrid salamanders consistent with the conservation strategy in Appendix K of the Habitat Plan (ICF International 2012).

3.6.2.2 Conservation Priorities

- Prioritize protection of occurrences.
- Prioritize protection of all unprotected critical habitat in the following CPUs: 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, Pajaro River, and Tequisquita Slough (Figure H-2, Appendix H, *Focal Species Habitat Models*).
- Using the conservation actions described above, enhance and restore protected breeding habitat in the following locations.
    - Northern and southern Upper Coyote Creek CPU, which contains the highest density of documented populations of California tiger salamander in the RCIS area and overlaps with

designated critical habitat in the RCIS area, with emphasis on the Coyote Valley Open Space Preserve.

- Laguna Seca in the Lower Coyote Creek-Frontal San Francisco Bay Estuaries CPU, where there is a high density of California tiger salamander occurrences (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017).
- Southern Henry W. Coe State Park, which contains breeding ponds in critical habitat.
- Within 1.3 miles of occupied or suitable habitat, where habitat protection, enhancement, and restoration should be prioritized to increase the likelihood of colonization by California tiger salamander.

3.6.2.3 Adaptation to Climate Change

Because California experiences highly variable annual rainfall events and droughts, California tiger salamanders have adapted a life history strategy to deal with these inconsistent environmental conditions (U.S. Fish and Wildlife Service 2017). California tiger salamander breeding success is tied very closely to rainfall amounts and timing, and different breeding locations may serve as population sources in different years, buffering the overall population against inter-annual variability (Cook et al. 2005). However, despite these life history strategies, climate change could result in even more erratic weather patterns that California tiger salamanders cannot adapt to quickly enough. Regardless of what occurs, it is clear that either drought or considerable changes in rainfall amounts or timing could be detrimental to California tiger salamander populations in the RCIS area, if those conditions persist over multiple breeding years.

Wright et al. (2013) estimated that the California tiger salamander was at "intermediate risk" from climate change. That estimate was based on the likely persistence of current species locations in 2050 and the amount of currently suitable habitat that is likely to remain suitable by 2050. Both eventualities were examined under four climate change scenarios, so there is considerable variability in the predictions. It was estimated that 20% - 80% of current California tiger salamander occurrences would persist through 2050 but that 20% - 99% of modeled suitable area would no longer be suitable. Across the four climate change scenarios, the prediction of future habitat varies from nearly all of the current habitat in the RICS area remaining suitable (particularly in the Diablo Range), to scenarios where hardly any of it remains suitable and habitat is much patchier.

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. Since 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 modeled habitat is a sufficient strategy for allowing California tiger salamander to adapt to climate change. Shifts in habitat should not be sudden, giving populations time to adapt to new habitat areas, provided they have access. Several of the conservation actions are focused on the intensive management of surface water resources used for breeding by California tiger salamander. Providing for enough duplication of breeding sites on protected lands will ensure that in any given year there will be source populations of California tiger salamander, even when some breeding sites may be too dry. Protecting and managing California tiger salamander 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.

3.6.3 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 through protection and enhancement of habitat.

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.

- **Conservation Action FYLF-1.** Acquire parcels with known breeding occurrences of foothill yellow-legged frog through fee title purchase or conservation easement.
- **Conservation Action FYLF-2.** Conduct surveys in suitable habitat to identify opportunities for habitat protection, restoration, and/or creation.

Objective 3-2: Reduce the threat of habitat loss by acquiring the additional habitat needed to meet this RCIS's conservation target for unprotected breeding/foraging habitat (12,600 acres) and low-use habitat (5,500 acres) (Figure H-3, Appendix H, *Focal Species Habitat Models*).

- **Conservation Action FYLF-3.** Target acquisition of 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) on protected land in the RCIS area (19,818 acres of modeled habitat).

- **Conservation Action FYLF-4.** Enhance seasonal breeding habitat by managing reservoir releases to occur before or after the peak foothill yellow-legged frog egg-laying period.
- **Conservation Action FYLF-5.** Control exotic species such as bullfrogs, mosquitofish, crayfish, nonnative predatory fish, and nonnative turtles by periodically draining perennial ponds.
- **Conservation Action FYLF-6.** Plant and/or seed native understory and overstory riparian vegetation within 15 feet of the edge of the low-flow channel to create structural diversity, provide overhead cover, and moderate water temperature.
- **Conservation Action FYLF-7.** Replace concrete, earthen or other engineered channels to restore floodplain connectivity.
- **Conservation Action FYLF-8.** Replace confined channels to restore floodplain connectivity and commensurate functions.
- **Conservation Action FYLF-9.** 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.

- **Conservation Action FYLF-10.** Census egg masses in breeding habitat downstream of reservoirs before and after releases to determine whether egg masses are lost.

3.6.3.2 Conservation Priorities

- Protect known occurrence of foothill yellow-legged frog in the RCIS area.
- Protect and enhance the following creek segments.
- 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 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 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 reproduction periods. Also, there is a concern that if the climate is drier and warmer, that will reduce in-stream habitat quality and that there will generally be less water available in the watershed to meet the needs of urban and agricultural use, with enough left over to meet the habitat needs of species that rely on in-stream habitats.

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 suitable areas that is likely to remain suitable by 2050. Both conditions (i.e., the likelihood of population persistence and the 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 were likely to persist through 2050, across all four climate scenarios. It was further determined that less than 20% of currently suitable habitat would become unsuitable by 2050. There was strong consensus across the models, under all four climate change scenarios, that all of the habitat in the RICS area that is currently 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*). All of the 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. Specific actions such as increasing rocky and sandy substrate in streams to provide breeding sites will ensure that current breeding locations remain viable and that new breeding locations are available should current locations become unsuitable.

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 through protection, restoration, and enhancement of habitat.

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).

- **Conservation Action CRLF-1.** Acquire parcels with known breeding occurrences and adjacent dispersal/refugia habitat for California red-legged frog.
- **Conservation Action CRLF-2.** Conduct surveys in suitable habitat to identify opportunities for habitat protection, restoration, and/or creation.

Objective 4-2: Reduce the threat of habitat loss and nonnative species by acquiring the additional habitat needed to meet this RCIS's conservation target for unprotected breeding habitat (1,800 acres), refugia habitat (10,700 acres), and dispersal habitat (252,600 acres).

- **Conservation 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 on protected land in the RCIS area (232,600 acres).

- **Conservation Action CRLF-4.** Enhance breeding habitat by managing ponds to support suitable vegetative cover for California red-legged frog.
- **Conservation 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.
- **Conservation Action CLRF-6.** Remove exotic species such as bullfrogs, mosquitofish, other nonnative predatory fish, and nonnative turtles from breeding ponds and stream segments.
- **Conservation Action CRLF-7.** Manage grazing (e.g., fencing, seasonal timing, stocking rates) to reduce impacts from cattle on California red-legged frog habitat.
- **Conservation 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 modeled 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.

- **Conservation Action CRLF-9.** Install fencing, where necessary, to reduce grazing pressure from cattle and exclude feral pigs from California red-legged frog breeding habitat. Fence installation should be carefully applied to avoid negatively affecting small mammal movement and upland habitat.
- **Conservation Action CRLF-10.** Establish native emergent vegetation around the perimeter of ponds and wetlands to provide breeding habitat for California red-legged frog.
- **Conservation Action CRLF-11.** Improve the hydroperiods and water quality of natural ponds and streams, and stock ponds for California red-legged frog by clearing vegetation, repairing eroding dams and spillways, and removing sediment, where appropriate (Ford et al. 2013).
- **Conservation Action CRLF-12.** Install woody debris around perimeter and in submerged banks of ponds and wetlands to create basking habitat and cover for native amphibians and turtles. Materials imported from outside of the watershed shall be treated for chytrid and other potential pathogens prior to installation.
- **Conservation Action CRLF-13.** Enhance seasonal breeding habitat by managing reservoir releases to occur before or after the peak California red-legged frog egg-laying period.

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 2010) 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 Jose and Morgan Hill in Lower Coyote Creek–Frontal San Francisco Bay Estuaries.
- Eastern edge of Pacheco Creek CPU, along the county line.
- Laguna Seca in the Lower Coyote Creek-Frontal San Francisco Bay Estuaries CPU (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017).
- Prioritize the protection of isolated breeding populations with limited habitat protection in the following locations (California Natural Diversity Database 2017).
    - South of Gilroy in the southern Uvas Creek CPU.
    - West of SR 25 in the Pajaro River CPU.
    - East of Hollister in the Tequisquita Slough CPU.
- Using the conservation actions described above, enhance protected breeding habitat in the following locations.
    - 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 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, to increase the likelihood that it will be colonized by California red-legged frog.

3.6.4.3 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, ensuring that there is enough water in the stream or pond during the right time of year, and 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. That estimate was based on the likely persistence of current populations in 2050 and the amount of currently suitable areas that is likely to remain suitable by 2050. Both conditions (i.e., the likelihood of population persistence and the suitability of habitat by 2050) were examined under four climate change scenarios, so there is considerable variability considered in the predictions. It was estimated that greater than 80% of current California red-legged frog occurrences were likely to persist through 2050, across all four climate scenarios. It was further determined that less than 20% of currently suitable habitat would become unsuitable by 2050. There was strong consensus across the models, under all four climate change scenarios, that all of the habitat in the RICS area that is currently suitable, would remain suitable. However, it was also noted in the report that even though current occurrences are likely to persist and habitat that is currently suitable will likely remain so, California red-legged frog is one of five amphibian species likely to see an overall reduction in habitat quality across the range. In fact, an overall reduction in habitat quality higher than that of the highest-risk species. However, an adequate amount of lower quality habitat will likely persist. It is also assumed that in the RCIS area the availability of water in stream systems and as ponded surface water 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 California red-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 California Coast Steelhead*). All of the 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.

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 conservation 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 and foraging habitat in the RCIS area.

Objective 5-1. Protect tricolored blackbird breeding habitat that supports, historically supported, or could support tricolored blackbird colonies in the RCIS area. Suitable foraging habitat should also be protected within 3 miles of breeding habitat.

- ***Conservation Action TRBL-1.*** Protect and manage modeled tricolored blackbird breeding habitat.
- ***Conservation Action TRBL-2.*** Conduct surveys in suitable habitat to identify opportunities for habitat protection, restoration, and/or creation.

Objective 5-2. Reduce the threat of habitat loss by acquiring the additional habitat needed to meet this RCIS's conservation target for unprotected breeding (108,100 acres) and foraging (93,700 acres) habitat.

- ***Conservation Action TRBL-3.*** Acquire parcels with unprotected tricolored blackbird colony sites and those with suitable nesting habitat through fee title or conservation easement in the RCIS area.
- ***Conservation Action TCBL-4.*** Acquire agricultural easements on suitable agricultural foraging habitat surrounding tricolored blackbird nest colonies to protect tricolored blackbird foraging habitat.
- ***Conservation 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 breeding habitat in the RCIS area, to identify nesting colonies and tricolored blackbird habitat use in the RCIS area, and to inform habitat protection, enhancement, restoration, and management.

Objective 5-3: Enhance tricolored blackbird breeding and foraging habitat on protected land in the RCIS area (138,700 acres).

- ***Conservation 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.
- ***Conservation 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.
- ***Conservation Action TRBL-8.*** In wetland complexes that support nest colonies, manage nonnative invasive plants so that native vegetation that provides suitable nesting substrate can develop.
- ***Conservation Action TCBL-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.
- ***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, particularly within 3 miles of active nest colonies and suitable nesting habitat.

3.6.5.2 Conservation Priorities

- Prioritize protection of occurrences.
- Protect and enhance nesting and foraging habitat that has been occupied within the last 15 years, and foraging habitat within 3 miles of that nesting habitat (Figure H-5, Appendix H, *Focal Species Habitat Models*). This includes the following historic nesting sites (ICF International 2012).
    - Calero Reservoir in the Llagas Creek CPU.
    - Cañada de Los Osos Ecological Reserve–Tooth Lake (Upper Coyote Creek CPU).
    - Del Puerto Canyon Road (Arroyo Valle CPU).
    - Coyote Valley (Upper Coyote Creek CPU).
- Prioritize protection of foraging habitat near protected colony sites.
- Fund surveys of historically documented colony sites to understand presence/absence patterns in the RCIS area.

3.6.5.3 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 is 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 a priority with respect to climate vulnerability (Table 3-4).

Table 3-4. Climate Vulnerability Scoring for Tricolored Blackbird as Described in Gardali et al. (2012)[1]

Criteria	Score[2, 3]
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; taxa with high dispersal ability

1 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

2 Scores range from 1 – 3; generally low, medium, and high

3 Climate vulnerability score = Sum of exposure score X Sum of sensitivity score

Despite the assessment that tricolored blackbird may not be 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. According to habitat suitability models under current and future conditions, the probability of tricolored blackbird occurrence in the RCIS area could decrease over time (Point Blue Conservation Science 2017). Models predict the same probability of occurrence but over a smaller area, with a lower probability (0-20%, down from 20-40%) in the future in the hills around Santa Clara Valley, but the same probability (20-40%)for occurrence in the valley itself as is currently expected.

Ponds and wetlands, the primary breeding habitats in the RCIS area, could become more ephemeral under drier conditions, reducing the extent of wetland vegetation needed for nesting. 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.

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 now 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 to 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.[8] 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 northern San Benito County, 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 foraging habitat in the RCIS area (Figure H-6, Appendix H, *Focal Species Habitat Models*), in coordination with the ongoing monitoring program being conducted for the Habitat Plan.

- ***Conservation Action BUOW-1.*** Acquire, through fee title purchase or conservation easement, parcels with documented burrowing owl nest sites.

Objective 6-2. Reduce the threat of habitat loss by acquiring the additional habitat needed to meet this RCIS's conservation target for unprotected breeding/overwintering (18,800 acres) and overwintering (34,300 acres) habitat.

- ***Conservation Action BUOW-2****.* Acquire, through fee title purchase or conservation easement, parcels with breeding habitat in the RCIS area outside of the Habitat Plan boundary.
- ***Conservation Action BUOW-3****.* Acquire, through fee title purchase or conservation easement, parcels with overwintering habitat for burrowing owl.
- ***Conservation Action BUOW-4****.* 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 6-3. Enhance burrowing owl habitat on protected land in the RCIS area (25,700 acres).

[9] Underpasses are where wildlife are crossing 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.

- ***Conservation Action BUOW-5.*** Use livestock grazing to create and maintain short-statured grasslands to encourage ground squirrel colonization, and to help support burrowing owl colonies.
- ***Conservation Action BUOW-6.*** Cease the use of rodenticides on protected lands, particularly in grasslands, to maintain a prey base and a source of burrows for burrowing owls.
- ***Conservation Action BUOW-7.*** Coordinate with the wildlife agencies to explore the feasibility of establishing artificial burrows or other means to promote breeding.

Objective 6-4: Work with private and public landowners to conduct land management practices in a way that will benefit burrowing owls.

- ***Conservation 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.
- ***Conservation 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.
- ***Conservation Action BUOW-10.*** Seek additional funding to support research.

3.6.6.2 Conservation Priorities

- Prioritize protection of any known or newly discovered occurrences.
- Protect and enhance known breeding habitat. Also, protect and enhance habitat on and adjacent to areas known to have been occupied in the RCIS area (Figure H-6, Appendix H, *Focal Species Habitat Models*). This includes the following historic nesting sites.
    - Upper Coyote Creek CPU (Henry W. Coe State Park).
    - Pajaro River CPU (Pajaro River Mitigation Bank).
    - Tequisquita Slough CPU.
    - Arroyo Valle CPU.
    - Arroyo Mocho CPU.
    - Arroyo Hondo CPU.
- Prioritize protection and enhance actions within 1.0 mile of documented burrowing owl occurrences.
- Provide funding to support an annual monitoring program for burrowing owl to monitor occupied burrowing owl habitat, monitor burrowing owl populations in the RCIS area, and to estimate the population target needed for burrowing owls to persist in the RCIS area.

3.6.6.3 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 is 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. Burrowing owl was given a score of 21, and was not considered a priority with respect to climate vulnerability (Table 3-5).

Table 3-5. Climate Vulnerability Scoring for Burrowing Owl as Described in Gardali et al. (2012)[1]

Criteria	Score[2, 3]
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; taxa use 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; taxa with high dispersal ability

1 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

2 Scores range from 1 – 3; generally low, medium, and high

3 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, in the RCIS area, the species is already in steep decline (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 and into northern San Benito County (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 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 by protecting habitat and enhancing and restoring protected habitat.

Objective 7-1. Protect known Swainson's hawk nesting trees in the RCIS area.

- ***Conservation Action SWHA-1.*** Conduct annual surveys of nesting habitat in the RCIS area to locate new nest locations and monitor the status of known nest sites to identify areas for habitat protection, enhancement, and restoration.
- ***Conservation Action SWHA-2.*** Acquire unprotected 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 threat of habitat loss by acquiring the additional habitat needed to meet this RCIS's conservation target for unprotected nesting (1,000 acres) and foraging (31,900 acres) habitat.

- ***Conservation Action SWHA-3.*** Acquire unprotected habitat nesting and foraging habitat in the RCIS area.

Objective 7-3. Enhance Swainson's hawk foraging and nesting habitat (Figure H-7, Appendix H, *Focal Species Habitat Models*) on protected land in the RCIS area (3,900 acres).

- ***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), to enhance prey populations for Swainson's hawk.
- ***Conservation Action SWHA-5.*** Maximize tree plantings 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.

- ***Conservation Action SWHA-6.*** Work with landowners on working lands to develop land management strategies that are designed 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).
- ***Conservation 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 occurrences in the RCIS area.
- Prioritize for protection and enhancement of habitat determined to be suitable within 1 mile of nest sites. The known 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, *Focal Species Habitat Models*).

3.6.7.3 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 is 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. Swainson's hawk was given a score of 42, and was therefore considered a priority with respect to climate vulnerability. Swainson's hawk is vulnerable to the effects of climate change due to an expected loss of habitat in the Central Valley, along with 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)[1]

Criteria	Score[2, 3]
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; taxa with high dispersal ability

1 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
2 Scores range from 1 – 3; generally low, medium, and high
3 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 2.3.5.3, *Focal Species Profiles*). There are ample opportunities for the species to expand its nesting range within the RCIS area (Figure H-7, Appendix H, *Focal Species Habitat Models*), 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 in the RCIS area, so any further loss would make nesting much less viable. Actions in the conservation strategy focused on working with private land owners on 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 acquiring suitable movement/foraging habitat in the southeastern and northeastern portion of this RCIS area (Figure H-8, Appendix H, *Focal Species Habitat Models*) needed to meet this RCIS's conservation target for unprotected movement/foraging habitat (47,800 acres) and low-use habitat (737 acres).

- ***Conservation Action SJKF-1.*** Conduct movement corridor studies of small to large mammals to identify targeted acquisition areas needed to improve connectivity.
- ***Conservation Action SJKF-2.*** Acquire San Joaquin kit fox denning/movement habitat to improve connectivity in the RCIS area, 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.

- ***Conservation Action SJKF-3***. Enhance existing landscape linkages for San Joaquin kit fox and other medium-sized and large mammals within movement/foraging habitat in the RCIS area.
- ***Conservation 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.

Objective 8-3: Enhance San Joaquin kit fox habitat on protected land in the RCIS area (7,200 acres).

- ***Conservation Action SJKF-5.*** 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.
- ***Conservation Action SJKF-6.*** Include species-specific measures in management plans that prohibit rodenticides and emphasize the conservation and expansion of California ground squirrel colonies.

- ***Conservation Action SJKF-7.*** Conduct targeted movement studies on lands in eastern Santa Clara and San Benito counties 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 8-4: Work with private and public landowners to conduct land management practices to benefit San Joaquin kit fox.

- ***Conservation Action SJFK-8.*** Work with owners and managers of working lands to develop land management strategies to benefit San Joaquin kit fox.
- ***Conservation Action SJFK-9*.** 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 to increase permeability between Central Valley populations and San Joaquin kit fox habitat in the Tequisquita Slough, Pacheco Creek, and Arroyo Valle CPUs (Figure H-8, Appendix H, *Focal Species Habitat Models*).
- Educate private landowners in southeastern Santa Clara County and in San Benito County on land management actions that could enhance grassland habitat and allow for wildlife movement across the landscape.
- Implement the conservation priorities for San Joaquin kit fox that are consistent with the conservation actions prioritized for those identified under Section 3.7.1, Habitat Connectivity and Landscape Linkage.

3.6.8.3 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 and northern San Benito 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. Facilitate the persistence of mountain lion populations in the RCIS area by improving habitat connectivity.

Objective 9-1. Improve habitat connectivity for mountain lion in the RCIS area to promote dispersal and gene flow to maintain populations.

- ***Conservation 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.
- ***Conservation 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 within the RCIS area.
- ***Conservation Action ML-3*.** Conduct targeted studies to track mountain lion movement patterns and habitat use in the RCIS area, particularly around movement pinch points; identify priority habitat to protect; and identify barriers to modify to improve landscape connectivity.
- ***Conservation Action ML-4*.** Improve vegetation cover in key linkage areas where lack of cover reduces the areas' suitability for wildlife passage.
- ***Conservation Action ML-5*.** Improve use of safe wildlife passage structures with directional fencing and maintenance of existing culverts throughout the RCIS area.

Objective 9-2. Implement a public outreach campaign to educate 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 reduce mountain lion populations.

- ***Conservation Action ML-6*.** Work with private landowners to discourage harming mountain lion, and to implement management practices that reduce negative mountain lion-livestock interactions.
- ***Conservation Action ML-7*.** Conduct public education 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), and *Coyote Valley Landscape Linkage Report* (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017) as a guiding documents.

Conservation 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 in the RCIS area (Figure 2-22b). 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: between Los Gatos and the western boundary of Santa Clara County.

New overpasses and/or underpasses designed for wildlife crossing are also needed to improve permeability in linkage areas. 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. 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 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 habitat that is still suitable. 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 lions 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, unprotected occurrences of Congdon's spikeweed (Figure H-9, Appendix H, *Focal Species Habitat Models*) and any newly discovered occurrences within the RCIS area.

- ***Conservation Action CSPW-1*.** Reduce the loss of Congdon's spikeweed occurrences by protecting occupied habitat.
- ***Conservation Action CSPW2.*** Establish an incentive program for private landowners for the protection of Congdon's spikeweed occurrences and habitat management.
- ***Conservation Action CSPW-3.*** Conduct surveys to identify undocumented occurrences of Congdon's spikeweed in the RCIS area, with a focus on areas within modeled habitat or near known occurrences.

Objective 10-2. Enhance Congdon's spikeweed habitat on protected land in the RCIS area (702 acres).

- ***Conservation Action CSPW-4.*** Conduct surveys of suitable habitat near known occurrences to identify locations where the habitat can be enhanced or restored to allow for population expansion.
- ***Conservation Action CSPW-5.*** Control invasive plants in occupied habitat throughout the RCIS area.

Objective 10-3. Restore and/or create occurrences of Congdon's spikeweed.

- ***Conservation Action CSPW-6***. Restore and/or establish new occurrences through translocation onto protected habitat.
- ***Conservation Action CSPW-7.*** Restore occupied habitat and suitable but unoccupied habitat for Congdon's spikeweed.
- ***Conservation Action CSPW-8.*** Create habitat for Congdon's spikeweed.
- ***Conservation Action CSPW-9****.* Store and maintain seeds from natural occurrences in the RCIS area at a Center for Plant Conservation certified botanic garden.

3.6.10.2 Conservation Priorities

Known occurrences of, and suitable habitat for, Congdon's spikeweed on large expanses of natural habitat (i.e., California annual grassland) should be prioritized over the protection and restoration of occurrences on fragmented habitat patches in urban or rural residential areas (e.g., golf courses), where feasible. 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-9, Appendix H, *Focal Species Habitat Models*). At present, the only documented occurrences of this species in the RCIS area are in relatively urban locations. Therefore, protection and management of existing occurrences of and suitable habitat for Congdon's spikeweed in the following locations should be prioritized because of their large size and relative intactness.

- Sunnyvale Baylands Park.
- San Jose–Santa Clara Regional Wastewater Treatment Facility Bufferlands.
- Survey suitable habitat to locate new occurrences for protection and enhancement.

3.6.10.3 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).

How individual species or populations are affected by changed conditions under a different climate are largely influenced by their phenotypic plasticity and their ability to move. 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., can dispersal 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 conservation 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 adaptable 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 the RCIS area. In addition, because the known occurrences of Congdon's spikeweed in the RCIS area 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 in the RCIS area 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. Creation and management of new habitat will increase the amount of available 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 acquiring the additional habitat needed to meet this RCIS's conservation target for unprotected occupied habitat (158 acres) and unprotected suitable habitat (83 acres) for Mount Hamilton thistle within the RCIS area (Figure H-10, Appendix H, *Focal Species Habitat Models*).

- ***Conservation Action MTHT-1.*** Acquire, through fee title purchase or conservation easement, land that supports parcels with known occurrences of Mount Hamilton thistle and/or that features suitable habitat in areas near existing known populations.
- ***Conservation Action MTHT-2***. Conduct surveys to identify additional occurrences of Mount Hamilton thistle in the RCIS area to inform future land protection.

Objective 11-2. Enhance Mount Hamilton thistle habitat on protected land in the RCIS area (235 acres).

- ***Conservation Action MTHT-3.*** Conduct research on Mount Hamilton thistle, in coordination with species experts, land managers, universities, and the regulatory agencies, to inform management.
- ***Conservation Action MTHT-4***. Conduct invasive species removal in suitable habitat, and address other stresses or threats, as determined by research in the RCIS area.
- ***Conservation 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 in the RCIS area.

Objective 11-3. Restore and/or create occurrences of Mount Hamilton thistle.

- ***Conservation Action MTHT-6.*** Restore and/or establish new occurrences through translocation onto protected habitat.

- ***Conservation Action MTHT-7.*** Restore occupied habitat and suitable but unoccupied habitat for Mount Hamilton thistle.
- ***Conservation Action MTHT-8.*** Create habitat for Mount Hamilton thistle.
- ***Conservation Action MTHT-9.*** Store and maintain seeds from natural occurrences in the RCIS area at a Center for Plant Conservation certified botanic garden.

3.6.11.2 Conservation Priorities

- Prioritize protection of occurrences.
- Evaluate occurrences on protected lands for enhancement actions.
- Survey suitable habitat to locate new occurrences for protection and enhancement.

3.6.11.3 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).

How individual species or populations are affected by changed conditions under a different climate are largely influenced by their phenotypic plasticity and their ability to move. 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., can dispersal 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 conservation 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 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 in the RCIS area is surrounded by large expanses of intensive urban development, and is threatened by further development. In addition, this species 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. 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 1998) 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 known 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. Creation and management of new habitat will increase the amount of available 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-11, Appendix H, *Focal Species Habitat Models*), and any newly discovered occurrences within the RCIS area.

- ***Conservation Action TE&RS-1***. Acquire parcels with known occurrences of Tracy's eriastrum and/or rock sanicle through fee title purchase or conservation easement.
- ***Conservation Action TE&RS-2***. Conduct surveys to identify additional occurrences of, and suitable habitat for, Tracy's eriastrum and rock sanicle, with a focus on the Arroyo Valle, Arroyo Hondo, and Upper Coyote Creek CPUs, where all known occurrences are found in the RCIS area.

Objective 12-2. Enhance rock sanicle occurrences and habitat on protected land within the RCIS area.

- ***Conservation 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.
- ***Conservation 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.

- ***Conservation Action TE&RS-5***. Restore and/or establish new occurrences through translocation onto protected habitat.
- ***Conservation Action TE&RS-6.*** Restore occupied habitat and suitable but unoccupied habitat for Tracy's eriastrum and rock sanicle.
- ***Conservation Action TE&RS-7.*** Create habitat for Tracy's eriastrum and rock sanicle.
- ***Conservation Action TE&RS-8.*** Store and maintain seeds from natural occurrences in the RCIS area 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-11, 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.
- Survey suitable habitat to locate new occurrences for protection and enhancement.

3.6.12.3 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).

How individual species or populations are affected by changed conditions under a different climate are largely influenced by their phenotypic plasticity and their ability to move. 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., can dispersal 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 conservation actions that facilitate dispersal across the landscape, and assisted migration (e.g., creating new occurrences).

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 extant occurrences of this species, coupled with the intent to protect large blocks of suitable habitat in the RCIS area 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. Creation and management of new habitat will increase the amount of available 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 within the RCIS area (Figure H-12, Appendix H, *Focal Species Habitat Models*).

- ***Conservation Action FF-1.*** Acquire parcels with known occurrences of fragrant fritillary and/or suitable habitat adjacent to known populations through fee title purchase or conservation easement.
- ***Conservation Action FF-2*****.** Conduct surveys to identify additional occurrences of fragrant fritillary in the RCIS area with an emphasis on surveying parcels adjacent to known occurrences.

Objective 13-2. Acquire the additional habitat (Figure H-12, Appendix H, *Focal Species Habitat Models*) needed to meet this RCIS's conservation target for unprotected primary habitat (3,300 acres) and secondary habitat (27,500 acres) in the RCIS area.

- ***Conservation Action FF-3*****.** Acquire unprotected fragrant fritillary habitat in the RCIS area.

Objective 13-3. Enhance fragrant fritillary occurrences and habitat on protected land in the RCIS area (50,200 acres).

- ***Conservation Action FF-4***. Use livestock grazing in a variety of regimes with the appropriate timing and intensity for fragrant fritillary.
- ***Conservation Action FF-5***. Conduct research on fragrant fritillary, in coordination with species experts, land managers, universities, and the regulatory agencies, to inform management.
- ***Conservation Action FF-6.*** Conduct invasive species removal in suitable habitat through hand pulling, mowing, or mechanical removal.
- ***Conservation 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.

- ***Conservation Action FF-8***. Restore and/or establish new occurrences through translocation onto protected habitat.
- ***Conservation Action FF-9.*** Restore occupied habitat and suitable but unoccupied habitat for fragrant fritillary.
- ***Conservation Action FF-10.*** Create habitat for fragrant fritillary.
- ***Conservation Action FF-11****.* Store and maintain seeds from natural occurrences in the RCIS area at a Center for Plant Conservation certified botanic garden.

3.6.13.2 Conservation Priorities

- Prioritize protection of occurrences.
- Evaluate occurrences on protected lands for enhancement actions.
- Survey suitable habitat to locate new occurrences for protection and enhancement.

3.6.13.3 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).

How individual species or populations are affected by changed conditions under a different climate are largely influenced by their phenotypic plasticity and their ability to move. 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., can dispersal 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 conservation 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 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, and 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. Therefore, the focus on protecting extant occurrences of this species, coupled with the intent to protect large blocks of suitable habitat in the RCIS area 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. Creation and management of new habitat will increase the amount of available 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 within the RCIS area (Figure H-13, Appendix H, *Focal Species Habitat Models*).

- ***Conservation Action LPH-1.*** Acquire parcels with known occurrences of Loma Prieta hoita and suitable habitat adjacent to known populations through fee title purchase or conservation easement.
- ***Conservation Action LPH-2.*** Conduct surveys to identify additional occurrences of Loma Prieta hoita in the RCIS area, with an emphasis on surveying parcels with known occurrences or parcels adjacent to known occurrences.

Objective 14-2. Acquire the additional habitat needed to meet this RCIS's conservation target for unprotected primary habitat (9,200 acres) and secondary habitat (3,800 acres) in the RCIS area (Figure H-13, Appendix H, *Focal Species Habitat Models*).

- ***Conservation Action LPH-3*****.** Acquire unprotected fragrant fritillary habitat in the RCIS area.

Objective 14-3. Enhance Loma Prieta hoita occurrences and habitat on protected land in the RCIS area (19,400 acres).

- ***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.
- ***Conservation 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.
- ***Conservation 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.

- ***Conservation Action LPH-7.*** Restore and/or establish new occurrences through translocation onto protected habitat.
- ***Conservation Action LPH-8.*** Restore occupied habitat and suitable but unoccupied habitat for Loma Prieta hoita.
- ***Conservation Action LPH-9.*** Create habitat for Loma Prieta hoita.
- ***Conservation Action LPH-10.*** Store and maintain seeds from natural occurrences in the RCIS area at a Center for Plant Conservation certified botanic garden.

3.6.14.2 Conservation Priorities

- Prioritize protection of occurrences.
- Evaluate occurrences on protected lands for enhancement actions.

- Survey suitable habitat to locate new occurrences for protection and enhancement.

3.6.14.3 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).

How individual species or populations are affected by changed conditions under a different climate are largely influenced by their phenotypic plasticity and their ability to move. 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., can dispersal 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 conservation actions that facilitate dispersal across the landscape, and assisted migration (e.g., creating new occurrences).

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 occur 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. In addition, 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. Without a year-round water source, some currently occupied habitat will become unsuitable and may reduce or eliminate adjacent suitable habitat. Therefore, the focus on protecting extant occurrences of this species, coupled with the intent to protect large blocks of suitable habitat in the RCIS area 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. Creation and management of new

habitat will increase the amount of available 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 within the RCIS area.

- ***Conservation Action SMLS-1.*** Acquire parcels with occurrences of smooth lessingia and suitable habitat in areas near known populations through fee title purchase or conservation easement.
- ***Conservation Action SMLS-2.*** Conduct surveys to identify additional occurrences of smooth lessingia in the RCIS area, with an emphasis on surveying parcels with known occurrences or parcels adjacent to known occurrences.

Objective 15-2. Acquire the habitat needed to meet this RCIS's conservation target for unprotected habitat (3,400 acres) for smooth lessingia in the RCIS area (Figure H-14, Appendix H, *Focal Species Habitat Models*).

- ***Conservation Action SMLS-3.*** Acquire unprotected smooth lessingia habitat in the RCIS area.

Objective 15-3. Enhance smooth lessingia occurrences and habitat on protected land in the RCIS area (5,700 acres).

- ***Conservation Action SMLS-4.*** Use livestock grazing in a variety of regimes with the appropriate timing and intensity for smooth lessingia.
- ***Conservation Action SMLS-5.*** Conduct invasive species removal in suitable habitat.

Objective 15-4. Restore and/or create occurrences of smooth lessingia.

- ***Conservation Action SMLS-6.*** Restore and/or establish new occurrences through translocation onto protected habitat.
- ***Conservation Action SMLS-7.*** Restore occupied habitat and suitable but unoccupied habitat for smooth lessingia.
- ***Conservation Action SMLS-8.*** Create habitat for smooth lessingia.
- ***Conservation Action SMLS-9.*** Store and maintain seeds from natural occurrences in the RCIS area at a Center for Plant Conservation certified botanic garden.

3.6.15.2 Conservation Priorities

- Prioritize protection of occurrences.
- Evaluate occurrences on protected lands for enhancement actions.
- Survey suitable habitat to locate new occurrences for protection and enhancement.

3.6.15.3 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).

How individual species or populations are affected by changed conditions under a different climate are largely influenced by their phenotypic plasticity and their ability to move. 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., can dispersal 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 conservation 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 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 adaptable 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 1998) and loss of habitat. In addition, 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 1998). This will ensure the persistence of known 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. Creation and management of new habitat will increase the amount of available 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.

- ***Conservation Action MBJ-1.*** Acquire parcels with known occurrences of most beautiful jewelflower and suitable habitat adjacent to known populations through fee title purchase or conservation easement.
- ***Conservation Action MBJ-2.*** Conduct surveys to identify additional occurrences of most beautiful jewelflower in the RCIS area, with an emphasis on surveying parcels with known occurrences or parcels adjacent to known occurrences.

Objective 16-2. Acquire habitat needed to meet the conservation target for unprotected primary habitat (8,500 acres) and secondary habitat (820 acres) in the RCIS area (Figure H-15, Appendix H, *Focal Species Habitat Models*).

- ***Conservation Action MBJ-3***. Acquire unprotected most beautiful jewelflower habitat in the RCIS area.

Objective 16-3. Enhance most beautiful jewelflower occurrences and habitat on protected land RCIS area (6,200 acres).

- ***Conservation Action MBJ-4.*** Use livestock grazing in a variety of regimes with the appropriate timing and intensity for most beautiful jewelflower.
- ***Conservation Action MBJ-5.*** Conduct invasive species removal in suitable habitat for most beautiful jewelflower.
- ***Conservation 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.

- ***Conservation Action MBJ-7.*** Restore and/or establish new occurrences through translocation onto protected habitat.
- ***Conservation Action MBJ-8.*** Restore occupied habitat and suitable but unoccupied habitat for most beautiful jewelflower.
- ***Conservation Action MBJ-9.*** Create habitat for most beautiful jewelflower.
- ***Conservation 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.

- Evaluate occurrences on protected lands for enhancement actions.
- Survey suitable habitat to locate new occurrences for protection and enhancement.

3.6.16.3 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).

How individual species or populations are affected by changed conditions under a different climate are largely influenced by their phenotypic plasticity and their ability to move. 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., can dispersal 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 conservation 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 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 adaptable 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 1998) and loss of habitat. In addition, 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 1998) to help ensure the long-term survival of this species. This will help to ensure the persistence of known 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. Creation and management of new habitat will increase the amount of available 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 the unique land cover types and other ecological resources within this RCIS area, as identified in Chapter 2, *Environmental Setting*. 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 important landscape linkages for the focal species and other native species in the RCIS area.

- ***Conservation 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 SR 17, U.S. 101, SR 152, SR 25, and other pinch points within the RCIS area.

- ***Conservation Action HC-2***. Identify known or potential road crossings with suitable habitat on both sides of the roadway for focal species or other native species and implement projects to protect them.
- ***Conservation Action HC-3*.** Remove or modify barriers to increase permeability to wildlife, and, where possible, install or repair crossings to increase permeability within the RCIS area for the focal species or other native species.
- ***Conservation 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.

- ***Conservation Action HC-5.*** Coordinate with state and local government agencies, including Caltrans, Santa Clara Valley Transportation Authority, City of San Jose, Santa Clara County, and San Benito County to implement conservation actions that will improve landscape connectivity.

Objective 17-3: Enhance permeability in stream habitat for anadromous fish and other aquatic species in the RCIS area.

The conservation actions under Section 3.6.1, *Central California Coast and Southern California Coast Steelhead*, will also be employed to meet Objective 17-3.

- ***Conservation Action HC-6.*** Identify and remove unnatural barriers to upstream migration for anadromous fish and other aquatic species.
- ***Conservation Action HC-7*.** Enhance the natural functions of floodplains in the RCIS area.

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*.
- Coyote Valley, the Soap Lake Floodplain, and the Upper Pajaro River are areas of critical landscape linkages for wildlife and plant dispersal in the RCIS area between the Santa Cruz Mountains and the Diablo Range. Prioritize major projects and minor enhancements in these areas and other important pinch points in the RCIS area to enhance or create linkages across SR 17, SR 25, SR 152, U.S. 101, Upper Pajaro River floodplain/Soap Lake floodplain, and other important movement routes (Diamond and Snyder 2013, ICF International 2012, Penrod et al. 2013, Diamond and Snyder 2016a, Diamond and Snyder 2016b, Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017). See Figure 2-22b for the locations of linkage features, including culverts, overpasses, and underpasses.[9] Priority linkage locations in the Soap Lake floodplain are shown as priority camera station locations on Figure 2-22b.

  Major projects include, but are not limited to, the following.

  - Replace the Trout Creek culvert along SR 17 with a large box culvert (13 feet high by 32 feet wide or larger) to encourage wildlife use.
  - Construct a wildlife crossing over or under SR 17 between Los Gatos and Leniham Dam (Lexington Reservoir).
  - Close Metcalf Road to vehicle traffic and convert the roadbed over Coyote Creek immediately east of Monterey Road in San Jose to a wildlife tunnel. To accomplish this, the road cut at the base of Tulare Hill would need to be recontoured down to Coyote Creek.
  - Replace the existing double box culvert at Tick Creek along U.S. 101 with a large arch culvert with a natural bottom. Remove large branches and sediment blocking the culvert.
  - Upgrade the existing box culvert at the Pajaro River at its intersection with SR 152, upstream of where the river intersects U.S. 101.

[9] Underpasses are where wildlife are crossing 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.

Minor Enhancements 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*.
- Revegetate habitat on the west side of the Lexington culvert along SR 17 to provide suitable cover for wildlife moving through the linkage but ensure that this vegetation does not directly block the front of the culvert.
- Remove chainlink fence along Monterey Road where it is adjacent to open space (i.e., Coyote Creek County Park) and replace the median k-rail barrier on Monterey Road to facilitate animal crossing. Remove barriers such as fences or gates in any other feasible locations along the Coyote Creek riparian corridor.
- Enhance the suitability of the Aldercroft Creek culvert by draining the large pool of water on the east side (which acts as a crossing barrier), and create banks for animals to walk along the access to the culvert.
- 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 in the RCIS area 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. In addition, repair sections of existing fences that have holes in dangerous locations for wildlife crossings.

3.7.1.3 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 the RCIS area. 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 both maintain economically viable operations and benefit wildlife use in the RCIS area.

- ***Conservation 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.
- ***Conservation Action WL-2-*** Work with public and private landowners to cease the use of rodenticides and limit the use of pesticides and herbicides, particularly near focal species occurrences***,*** and encourage land managers to use integrated pest management principals.
- ***Conservation 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.
- ***Conservation Action WL-4.*** Offer financial and regulatory incentives to private landowners to maintain and enhance habitat for focal species.
- ***Conservation Action WL-5.*** Introduce livestock grazing to reduce vegetation cover that currently excludes ground squirrels and encourage ground squirrel colonization.
- ***Conservation 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 conservation 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 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 meet important breeding, foraging, and roosting habitat needs 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 in the RCIS area, limiting their availability for the for the focal species that rely on them as foraging, dispersal, or even breeding habitat (i.e. 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 the RCIS area (Table 3-1).

- ***Conservation 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 in the RCIS area.

- ***Conservation 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.
- ***Conservation 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 soils that have 30% or more serpentine components (includes serpentine, ultrabasic, and alluvium soils derived from serpentine) and that are adjacent to protected areas, as shown on Figure 2-10.

3.7.3.3 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 plant species 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. In addition, climate change is expected to affect the relative dominance of native versus nonnative vegetation (U.S. Fish

and Wildlife Service 1998). 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 conservation 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 in the RCIS area 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.

- ***Conservation Action ULCT-1.*** Work with the land managers to incorporate management practices that benefit unique land cover types on public and private lands.
- ***Conservation 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.
- ***Conservation Action ULCT-3.*** Acquire, through fee title purchase or conservation easement, unique land cover types in the RCIS area.
- ***Conservation Action ULCT-4.*** Restore unique land cover types in the RCIS area.

Objective 20-2. Protect and manage tidal and subtidal communities for the benefit of rare, threatened, and endangered species and to retain a coastal zone that is protective against sea-level rise, consistent with the conservation plans in Appendix I, *Summary of Bayland Conservation Strategies*[10].

- ***Conservation Action ULCT-5.*** Acquire existing, historic, and restorable tidal marsh habitat in the RCIS area to promote the long-term conservation of this habitat.
- ***Conservation Action ULCT-6.*** Enhance, restore, and create tidal and subtidal habitat in the RCIS area, working with private and public landowners (e.g., Don Edwards National Wildlife Refuge).

[10] 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, 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.

- ***Conservation Action ULCT-7.*** Conduct studies to investigate key data gaps (e.g., population viability analysis or predation impacts) for focal and nonfocal species that occur in the baylands in the RCIS area.

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 will be 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; and/or 3) the presence of focal species (Santa Clara Valley Open Space Authority and Conservation Biology Institute 2017, San Francisco Bay Restoration Authority 2017, Goals Project 2015, ICF International 2012).

- Los Gatos Creek.
- Pacheco Creek.
- Laguna Seca.
- Fisher Creek.
- Permanente Creek.
- Adobe Creek.

Fisheries and Aquatic Habitat Collaborative Effort (i.e., Coyote Creek, Stevens Creek, and the Guadalupe River).

3.7.4.3 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 2.5.3, *Unique Land Cover Types*. Some of these land cover types have a limited distribution in the RCIS area 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 in the RCIS area. 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, *Existing 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 the 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 enhancement actions, restoration 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 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 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, nonnative 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 nonnative 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, nonnative wildlife.
- Plant and/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.
- 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 road crossing opportunities for San Joaquin kit fox across 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.
- 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 in the RCIS area 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 and/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 33 routine O&M, minor new construction, and Community Pipeline Safety Initiative (CPSI) activities for its electric and gas transmission and distribution systems 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 HCP's conservation strategy is guided by five key principles:

1. The avoidance and minimization of impacts is ensured by a thorough review of covered activities via environmental impact review, planning, and screening.
2. Avoiding impacts on habitat (i.e., implementing AMMs and BMPs) is preferable to mitigating or preserving habitat offsite.
3. Preserving lands for covered species with high-quality habitat or of high conservation value helps to build on other local and regional conservation efforts.
4. Preserving large, contiguous areas of habitat is preferable to preserving a larger number of small areas.
5. Habitat mitigation lands will be protected and managed in perpetuity.

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 known 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 levels across the study area/RCIS area.

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. However, 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 (SVP), 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 under Section 10(a) of the ESA.

The species covered by the 30-year permit HCP include the federally-threatened Bay checkerspot butterfly (*Euphydryas editha bayensis*), as well as four federally endangered plant species: the coyote ceanothus (*Ceanothus ferrisae*), Metcalf Canyon jewelflower (*Streptanthus albidus* ssp. *albidus*), Santa Clara Valley dudleya (*Dudleya abramsii* ssp. *setchellii*), and the Tiburon paintbrush (*Castilleja affinis* ssp. *neglecta*). 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.

The biological goals and objectives for the low-effect HCP include the following:

- To reduce potential cumulative effects to Bay checkerspot butterfly and federally-listed serpentine plants from the DVR to less-than-significant levels. The objectives of this goal are to:
    - Acquire and establish a 40-acre property as a permanent conservation area called the DVR Ecological Preserve for Bay checkerspot butterfly and federally listed serpentine plants.
    - Establish and fund an endowment for management of the DVR Ecological Preserve in perpetuity.
- To protect, manage, and maintain the existing habitat for Bay checkerspot butterfly and federally listed serpentine plants at the DVR Ecological Preserve. The objectives of this goal are to:
    - Monitor the DVR Ecological Preserve for plant composition, including cover of butterfly host and nectar sources, nonnative grasses, invasive weeds, and serpentine endemic plants.
    - Minimize the spread of invasive weeds and nonnative annual grasses in locations where they can have negative effects on the host and nectar plants for butterflies and on the listed endemic plants.
    - Manage the DVR Ecological Preserve through controlled grazing.
    - Maintain a grazing lease on the 40-acre DVR Ecological Preserve for the life of the DVR Power Plant (30 years). The grazing regime shall be flexible enough to account for climatic variability.
- Protect populations of Bay checkerspot butterfly and federally listed serpentine plants at the DVR Ecological Preserve. The objective of this goal is to:
    - Monitor populations of Bay checkerspot butterflies and the federally listed serpentine plants.

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 performed 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 has a 50-year permit term. 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, receiving a 50-year endangered species take permit in March 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 Jose, 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 nonnative 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, nonnative annual grasslands, oak woodlands, oak savanna, coastal sage scrub, serpentine coastal sage scrub, and riparian habitats. The low-effect HCP only covers a single species, 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 includes 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 4.19 acres of annual grassland, serpentine grassland, interior live oak woodland, coastal sage scrub, and riparian habitats. The low-effect HCP covers a single species, the 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 includes 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 0.83 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 six 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 (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[11], 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:

1. Reduce the present or threatened destruction, modification, or curtailment of habitat or range.
2. Ameliorate utilization for commercial, recreational, scientific, or educational purposes.
3. Abate disease and predation.
4. Establish the adequacy of existing regulatory mechanisms for protecting Central California Coastal steelhead DPS now and into the future (i.e., post-delisting).
5. Address other natural or manmade factors affecting the continued existence of Central California Coastal steelhead DPS.
6. Ensure Central California Coastal steelhead DPS is at a low risk of extinction based on abundance, growth rate, spatial recovery, and diversity.

The 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:

- Priority 1. An action that must be taken to prevent extinction or to identify those actions necessary to prevent extinction.

[11] Diversity Strata are geographically distinct areas with similar environmental conditions (National Marine Fisheries Service 2016).

- 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.

The goals, objectives, conservation 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 by:

- 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' conservation actions that address the targeted attributes or threats identified in the recovery plan for the RCIS area.

Table 3-7. Santa Clara County RCIS Conservation 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 Conservation 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, HC-6, HC-7
Habitat complexity	CCC-1, CCC-2, CCC-5, CCC-10
Riparian	CCC-1, CCC-2, CCC-5, CCC-11
Sediment	CCC-1, CCC-2, CCC-5, CCC-8, CCC-9
Water quality	CCC-2, CCC-5, CCC-7, CCC-9, CCC-11
Viability	CCC-2, CCC-3
Channel modification	CCC-1, CCC-2, CCC-4, CCC-5, CCC-8, CCC-11
Disease/predation/competition	CCC-10
Fishing/collecting	N/A
Hatcheries	N/A
Livestock	WL-1, WL-3-6
Mining	CCC-9
Recreation	CCC-1, CCC-2, CCC-11
Residential/commercial development	CCC-1, CCC-2, CCC-5, CCC-11
Roads/railroads	CCC-1, CCC-2, CCC-5, CCC-7, CCC-11
Severe weather patterns	N/A
Water diversions/impoundments	CCC-4, CCC-8, HC-6, HC-7

3.8.2.2 Recovery Plan for the South-Central Coast Steelhead

The South-Central California Coast Steelhead Recovery Plan (National Marine Fisheries Service 2013) identifies four biogeographic population groups (BPG) in the South-Central California Coast Steelhead (SCCCS) Recovery Planning Area. Recovery of a minimum number of viable populations within each BPG will be necessary to recover the SCCCS Distinct Population Segment (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 SCCCS Recovery 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 SCCCS Recovery 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 California Coast 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 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 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 recovery plan identifies a full suite of recovery actions necessary to recovery SCCCS populations, and to help achieve the goal of the recovery plan. Table 9-4 in the 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, nonnative species, recreational facilities, roads, upslope/upstream activities, urban developments, and urban effluents (National Marine Fisheries Service 2013).

This RCIS' conservation goal, objectives, conservation 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 California Coast 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 recovery plan and the recovery plan can be used to identify specific locations or finer detail about the type of conservation 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 recovery plan. The RCIS does not address groundwater depletion and conservation actions that might be used to reduce the effects of groundwater drawdown on instream habitat. Instead the RCIS focuses on restoration activities that could be implemented to improve instream 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 (U.S. Fish and Wildlife Service 2013). The Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California focuses on five endangered species: two endangered animals, California clapper rail (*Rallus longirostris obsoletus*) and salt marsh harvest mouse (*Reithrodontomys raviventris*), and three endangered plants, Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*), sotft bird's beak (*Chloropyron molle* ssp. *molle*), and California sea-blite (*Suaeda californica*). In addition, the 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*). Recovery goals and objectives were only set 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 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 explicitly 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 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, by implementing Conservation Actions ULCT-3 and ULCT-4, 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 Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California objectives to:

- 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' Conservation Action ULCT 5, recommends conducting studies to investigate key data gaps for species that occur in the baylands in the RCIS area. This conservation action is consistent with the Recovery Plan for Tidal Marsh Ecosystems of Northern and Central California 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 (U.S. Fish and Wildlife Service 1998). The 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 recovery plan is to delist federally listed species addressed by the recovery plan and ensure the long-term conservation of species of concern covered in the recovery plan. 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 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 recovery plan is increased by protecting entire communities, and by doing so, conservation of species of concern also addressed by the recovery plan 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:

1. Habitat protection.
2. Habitat management and restoration, including removal of invasive nonnative species.
3. Surveying and monitoring.
4. Ex-situ conservation, such as artificial rearing and seed banking.
5. Research.
6. Public participation, outreach, and education.

The 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, conservation 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 Santa Clara County 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 conduct surveys to identify habitat for these species to inform habitat protection. Furthermore, this RCIS includes Objective 19-1 and Conservation 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 nonnative species. This RCIS identifies objectives and conservation 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 conservation 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 conservation actions to conduct surveys to locate new occurrences of Mount Hamilton thistle, smooth lessingia, and most beautiful jewelflower. This RCIS also includes a monitoring and adaptive management framework (Section 3.9, *Monitoring and Adaptive Management Framework*) that can be used to develop monitoring and adaptive management 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 conservation 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 conservation 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 strategy to recover the 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 goal of this 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 recovery objectives of the plan are to:

- 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.

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. Several recovery actions are identified in the Implementation Schedule for the Central California Tiger Salamander, starting on page III-14 of the recovery plan (U.S. Fish and Wildlife Service 2017). Those actions are grouped into the following seven categories.

- **Maintain current distribution of species.** Maintaining the current distribution of the species will increase the resiliency of the Central California tiger salamander to withstand stochastic events and ensure that the genetic diversity of the species is maintained.
- **Maintain genetic structure across the species range.** Preserving native genetic diversity is necessary to preserve genes adapted to local environments, maintain evolutionary potential for adaptation to future stresses, and reduce the potential for inbreeding depression.
- **Reduce road mortality.**
- **Reduce the risk of introduction of diseases (e.g., ranaviruses, chytrid fungi, or other pathogens) within preserves.**
- **Reduce levels of nonnative predator species within preserves.**
- **Develop and implement adaptive management and monitoring plans for protected habitat counted toward recovery.** All preserves should have management and monitoring plans. These plans should specifically target management and monitoring of Central California tiger salamander breeding and upland habitat to maintain habitat suitability in perpetuity. The plans may include, but are not limited to, actions to identify and reduce harmful contaminants, nonnative predator species, road mortality, and nonnative tiger salamanders and hybrids. Management plans should describe grazing management and disease prevention strategies. Plans should be updated based on feedback from land managers and adaptive to climate change and other variables.

- **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 recovery plan, listed above. The 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 nonnative species and compromised genetic diversity are central pieces of both the RCIS and 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 in 2002 (U.S. Fish and Wildlife Service 2002). The goal of the 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 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 conservation 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[1]	RCIS Objectives and Conservation Actions that Support Conservation Need
Protect existing populations	ESFB, SCV	Objectives 4-1, 4-2, 4-3, 4-4
Control nonnative predators	ESFB, SCV	Conservation 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, Conservation Actions CRLF-7 and CRFL-9 are intended to address impacts from grazing.
Reduce impacts associated with livestock grazing	ESFB	Conservation Action CRLF-7, CRLF-9
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.

Conservation Need Identified in Recovery Plan	Core Recovery Area[1]	RCIS Objectives and Conservation Actions that Support Conservation Need
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, 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.

[1] East San Francisco Bay (ESFB); Santa Clara Valley (SCV)

3.9 Monitoring and Adaptive Management Framework

According to the Program Guidelines, in order for an individual or entity to develop a mitigation credit agreement (MCA) under this Santa Clara County RCIS, this RCIS must include an adaptive management and monitoring framework. This section provides an overview of monitoring and adaptive management and describes the framework that will be used when developing monitoring and adaptive management plans for each MCA in the RCIS area. Monitoring and adaptive management plans will only be required for conservation actions or habitat enhancement actions that are implemented under MCAs.

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 or enhancement actions being executed. Unless otherwise determined by CDFW or other participating regulatory agencies, the elements of the monitoring and adaptive management framework described in this section will need to be addressed in any MCA prepared under this Santa Clara County RCIS.

A monitoring and adaptive management plan could be developed for any voluntary conservation action in the RCIS area (unrelated to an MCA), but it is not required. Such a monitoring and adaptive management plan consistent with the framework described in this section would provide the same benefits as those described for mitigation actions.

3.9.1 Objectives

The overarching objective of monitoring and adaptive management is to ensure that conservation and enhancement actions are implemented in ways that benefit focal species and other resources credited under the agreement, and contribute to the achievement of conservation goals and objectives stated in the RCIS. This section presents a framework for site-specific monitoring and adaptive management strategies for each MCA site(s). Additional objectives of monitoring and adaptive management include the following.

- Create a structured decision-making framework that can be used as the basis for collecting information, verifying hypotheses, and designing and changing management practices.
- Develop and implement effective and efficient monitoring protocols to ensure that data collected will inform adaptive management.
- Document the baseline condition of biological resources on mitigation lands and other key habitat outside of mitigation parcels using existing data, modeling, and the results of ongoing field surveys.
- Provide an organizational framework and decision-making process for evaluating monitoring and other data to determine whether and how to adjust management actions.

3.9.2 Phases of Monitoring and Adaptive Management

Monitoring and adaptive management can be organized into three phases: baseline inventory, management and monitoring planning, and long-term monitoring and adaptive management. Key tasks in each phase are described in this section.

3.9.2.1 Baseline Inventory Phase

In general, activities in the baseline inventory phase occur during the first 1 to 2 years following the commitment to conduct conservation or enhancement actions. The baseline inventory phase occurs on new mitigation sites prior to or when they are secured (e.g., land acquisition, conservation easement, management agreement with landowner, or other mechanism). In some cases, baseline information may have been collected during the site assessment process. Baseline information is used to assess changes in biological resources once conservation or enhancement actions are applied. This information lays the foundation for monitoring and adaptive management. Inventories may need to occur over multiple seasons to ensure that all focal species present are identified, or to accommodate any climatic variation between years (e.g., below-average rainfall).

The MCA proponent inventories and assesses populations or status (e.g., presence/absence) of focal species, as appropriate, on mitigation properties. At a minimum, baseline monitoring data must be collected so that MCA proponents can assess the following.

- The contribution of conservation or enhancement actions to the relevant conservation goals and objectives in the RCIS.
- The net ecological gain in the area and quality of habitat or other natural resource values.
- The progress toward meeting performance-based milestones and achievement of ecological performance standards that will determine when and how many mitigation credits are released.

During the baseline inventory phase, the MCA proponent may also develop and test hypotheses about key relationships between species, habitats, and processes; the identification and assessment of threats and stressors to natural communities and species; the prioritization of conservation actions on the mitigation site; and the selection of biotic and abiotic indicators for evaluating habitat condition over time.

Baseline conditions on the mitigation site need to be documented to enable management planning and to serve as a comparison point for future monitoring. Accordingly, resources of interest that occur on a site need to be assessed, documented, and mapped. Baseline conditions can be documented with historical data and trends, as available and appropriate, surveys focused on presence/absence of focal species for which mitigation credit is being sought, and the condition of habitats that support those species. If mitigation credit is being sought for other conservation elements (e.g., landscape linkage implementation, aquatic resources, rare or unique land cover types) those resources should be assessed as well. Baseline assessments of resources that are regulated by other federal, state, or local agencies, or are subject to other CDFW permits (i.e., Lake and Streambed Alteration Agreement) should be consistent with standards and protocols recognized by those agencies where possible, to create monitoring efficiency.

3.9.2.2 Management and Monitoring Planning Phase

Once the baseline condition of the mitigation site is understood, MCA preparers develop the required monitoring and long-term adaptive management plan. The monitoring and long-term adaptive management plan will memorialize the desired outcomes and success criteria for the mitigation site, as described in the MCA. Management and monitoring planning will generally consist of the following tasks.

- Identify the stressors and threats to the focal species or habitat.
- Describe management actions that will be used to address the stressor and threats and improve habitat for focal species, as well as conditions for other conservation elements.
- Describe desired outcomes of management actions, including a species population response, habitat condition, or change in other conservation element.
- Prioritize implementation of conservation actions to best achieve mitigation objectives.
- Describe monitoring protocols including methods and equipment used, monitoring frequency, and monitoring timing, and identify sampling design.
- Develop criteria for measuring success of any enhancement or restoration efforts.
- Describe condition of infrastructure and necessary infrastructure improvements needed to execute the management program.

As much as possible the management plan should be a practical guide to management and monitoring actions that will occur on the mitigation site over time, written with the land manager and monitors in mind.

3.9.2.3 Long-Term Monitoring and Adaptive Management Phase

The planning phase is followed by long-term monitoring and adaptive management (Section 3.9.3, *Adaptive Management*) to determine the status and trends of focal species and habitats and the effectiveness of the management of the mitigation site. Long-term monitoring is implemented after

the baseline inventory phase is complete and any near-term restoration or enhancement actions have been largely completed. Long-term monitoring uses the framework developed during the planning phase and memorialized in the monitoring and long-term adaptive management plan to carry out effectiveness monitoring and to implement adaptive management.

The long-term monitoring phase includes the following tasks.

- Monitor species response to any enhancement, restoration, or habitat creation described in the MCA and management plan.
- Monitor restoration sites for success; remediate sites if initial success criteria are not being met. The management plan will identify triggers for remediation, if necessary.
- Assess status and trends of focal species by monitoring species populations, habitat, and other indicators over time.

In many cases, as sites approach and ultimately meet their performance-based metrics, monitoring frequency and intensity can be reduced. Similar to management actions, the monitoring program can change over time in response to the information collected and the trends observed. This adaptive approach to the monitoring program ensures that enough data are being collected to determine whether the mitigation site is performing as expected, while also avoiding unnecessary monitoring costs.

3.9.3 Adaptive Management

- Adaptive management is a decision-making process that adjust actions as uncertainties become better understood or as conditions change. 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 conservation 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 a monitoring and adaptive management 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. The adaptive management process is administered by the MCA holder in coordination with CDFW.

  Adaptive management includes the following tasks.

  - Evaluate efficacy of monitoring protocols.
  - Incorporate best available scientific information into management.
  - Review any unexpected or unfavorable results and test hypotheses to achieve desired outcome.
  - Adjust management actions and continue to monitor.
  - Adjust success criteria and conservation actions, if necessary.

3.9.4 Types of Monitoring

A monitoring plan is developed for each mitigation site. The monitoring plan comprises two types of monitoring: routine monitoring and effectiveness monitoring. The monitoring plan includes protocols, indicators, monitoring schedule, and success criteria based on the guidance offered in this section. CDFW approves, the monitoring plan as part of the MCA approval process. Other participating regulatory agencies may also review and approve the monitoring plan.

3.9.4.1 Routine Monitoring

Routine monitoring (also known as easement monitoring) tracks the status of 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. For MCAs in the RCIS area, routine monitoring will, at a minimum, track the following components.

- Maintaining the property in a condition consistent with the easement.
- Maintaining infrastructure and access as stated in the easement.
- Implementing enhancement and restoration actions as described in the MCA.
- Implementing management actions as described in the MCA.
- Reporting of monitoring activities conducted.

3.9.4.2 Effectiveness Monitoring

Effectiveness monitoring assesses the biological success or failure of conservation actions or enhancement actions and is only required on actions that have been approved for mitigation credit under an MCA. Effectiveness monitoring may also be used on voluntary conservation investments in order to determine if management actions are achieving the desired outcomes, but it is not required. 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).

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 monitoring and adaptive management program. The purpose of effectiveness monitoring is to ascertain the success of management in achieving desired outcomes, to provide information and mechanisms for altering management if necessary, and to evaluate whether the mitigation credit agreement was successful. Monitoring results may also be used to determine when mitigation credits can be released and when they are available for use or sale. Further, results from effectiveness monitoring can be used to establish how implementation of the MCA or voluntary conservation investment contributes to the achievement of conservation goals and objectives.

Effectiveness monitoring includes the development and assessment of success criteria (i.e., performance-based milestones) for conservation and enhancement actions. The conservation goals and objectives determine the nature of the success criteria. In other words, success criteria should be structured in a way that allows the RCIS applicant, MCA proponent, CDFW, or other interested agencies to determine whether implementation of the conservation or enhancement action achieves, or partially achieves, one or more conservation objectives.

3.9.5 Key Elements of Monitoring Program

In addition to the guidelines described previously, the following steps will be included when designing the monitoring program so that it can most effectively inform any necessary changes in management.

- **Determine what to measure.** Establish the attributes or variables that the monitoring will measure to answer the question previously defined. This step includes the development of measurable success criteria for evaluating management actions.
    - **Species status.** Monitoring whether species are present and comparing species status (e.g., species health, life history stages, and population size) across years can determine whether and how well management actions are working.
    - **Habitat quality**. 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 assessing how species respond to restoration or enhancement actions on mitigation lands.
- **Develop monitoring protocols.** Questions to be answered by the monitoring program will be at the species or habitat level. Monitoring protocols vary depending on the species or habitat type being monitoring. In some cases, standardized or CDFW-approved protocols exist.[12] When appropriate, those protocols should be used, although sometimes variations in those protocols may be warranted.
- **Ensure monitoring frequency matches need.** Tie the frequency of monitoring directly to the needs of the MCA and the cycles of the focal species and other natural resources. In some cases, especially early in implementation, more frequent monitoring may ensure that conservation and enhancement actions make progress toward performance-based milestones (and, ultimately, credit release). In other cases, monitoring may need to occur more infrequently. Ensure that the frequency of monitoring efforts matches the question being asked. Factors that may influence the frequency or type of monitoring include, but are not limited to the following.
    - Natural history of the species being monitored.
    - Variability in habitat between years due to uncontrollable factors (e.g., rainfall).
    - Variability in species population levels between years due to uncontrollable factors (e.g., drought or fire).
    - Variability in habitat quality between potential sampling locations.
- **Use indicator species, if appropriate.** Use groups of species or indicator species where possible to streamline monitoring. Indicators are selected because they are easy to survey and provide usable information on the species, habitat, or ecosystem in question.

[12] However, many CDFW-approved protocols are designed to detect species presence on proposed development sites and may not be suitable for long-term monitoring to detect species trends or responses to management actions.

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Chapter 4
Implementation

After approval by the California Department of Fish and Wildlife (CDFW), the regional conservation investment strategy (RCIS) can be used immediately 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.

- Conservation organizations making conservation investments in the RCIS area.
- State or federal agencies evaluating grant or permit applications for local conservation or research projects.
- Project proponents to guide the siting and design of compensatory mitigation projects and project-level permitting for listed species.
- Landowners, public agencies, private entities, or others interested in establishing a mitigation or conservation bank or developing 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. 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 4.2.2.2, *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 implementation sponsor *may* do (see Section 4.2, *Implementation Structure*, for a description of the implementation sponsor), as opposed to required elements that they *will* do or *shall* do. To make it explicit, Section 4.2.1, *Required Responsibilities of Implementation Sponsor*, describes those elements required during implementation, and Section 4.2.2, *Other Potential Implementation Sponsor Activities*, describes elements that are not required, but may prove helpful.

It is not the intent for the implementation sponsor to fully fund all aspects of implementation. Instead, it is assumed that the implementation sponsor would facilitate implementation activities using some funds of their own, but also through funding partnerships with other interested parties, including proponents of MCAs. It is further assumed that entities pursuing mitigation credit agreements under the RCIS would fully fund their involvement in, and development of, those MCAs – and that the Implementation Sponsor would bear no financial responsibility for development or monitoring of those MCAs.

4.1 Goals of Implementation

The purpose of the RCIS is to provide information to facilitate conservation actions or habitat enhancement actions in the RCIS area. These actions include those driven by regulatory needs (primarily in the form of mitigation) as well as other 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 Implementation Structure

The RCIS priority conservation actions will be implemented collectively by all voluntary users of the RCIS. These users could include any or all of the entities listed above. The Program Guidelines (California Department of Fish and Wildlife 2017) define the RCIS applicant as the public agency or group of public agencies responsible for the technical and administrative updates[1] to an RCIS. For the purposes of this Santa Clara County RCIS, the *implementation sponsor* is the entity or entities responsible for conducting periodic technical and administrative updates to this RCIS consistent with the Program Guidelines. The applicant and implementation sponsor for the Santa Clara RCIS is the Santa Clara Valley Open Space Authority (Authority).

It is expected that this Santa Clara County RCIS will be used to support establishment of one or more MCAs. For an RCIS to support an MCA, California Fish and Game Code (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 responsibilities of the implementation sponsor and its partners are described in the following subsections.

[1] The Program Guidelines state that "[a]n updated RCIS means updates to an RCIS best available science; it does not include updates or amendments to the geographic area, focal species, or other conservation elements." See Section 4.4, *Amending the RCIS,* for the definition of an RCIS amendment and the RCIS amendment process.

4.2.1 Required Responsibilities of Implementation Sponsor

As the implementation sponsor for this Santa Clara County RCIS, the Authority, in coordination with the Santa Clara Valley Habitat Agency (Habitat Agency), CDFW, and potentially with the support of an implementation committee, will be responsible for the following actions.

- Ensuring that this Santa Clara County RCIS is updated at least once every 10 years, until all mitigation credits are used, so that it reflects the most up-to-date information about resources in the RCIS area.
- Assessing progress towards meeting this RCIS's goals and objectives, through conservation investments and mitigation actions, at least once every 10 years, or until all mitigation credits are used.

CDFW may extend the duration of an approved RCIS for additional periods of up to 10 years after this RCIS is updated with new scientific information and CDFW finds that this RCIS continues to meet the requirements of CFGC 1852. CDFW will maintain a list and status of all MCAs that are active in the RCIS area on their website.

4.2.1.1 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, 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 may be presented either as part of a progress report (Section 4.2.2.1, *Progress Report*) or as a stand-alone document. If the 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 4.4, *Amending the RCIS*.

4.2.1.2 Assessing Progress

To determine whether this Santa Clara County RCIS is meeting its conservation goals and objectives, the Authority, in coordination with the Valley Habitat Agency and CDFW, will assess the status of conservation actions and habitat enhancement actions in the RCIS area and relate those actions to the conservation goals and objectives in this RCIS (Chapter 3, *Conservation Strategy*) at least once every 10 years, or until all mitigation credits are used. As part of this assessment, the Authority and the Valley Habitat Agency will coordinate to use data provided by CDFW to compile the status of MCAs being used in the Santa Clara County RCIS area as well as progress toward meeting the conservation goals and objectives of this RCIS.

4.2.2 Other Potential Implementation Sponsor Activities

Section 4.2.1, *Required Responsibilities of Implementation Sponsor*, describes the minimum requirements for implementation, 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.

4.2.2.1 Progress Report

The implementation sponsor, may prepare an RCIS implementation progress report. Progress reports are not required by CFGC or the Program Guidelines, but may prove useful in communicating the progress made toward achieving the conservation goals and objectives in the RCIS. If prepared, the progress report could include the following.

- An overview of the conservation actions and habitat enhancement actions that the Authority and implementation committee is aware of, and only those specifically implemented under this Santa Clara County RCIS.
- An assessment of progress in offsetting identified threats to focal species and other conservation elements and in achieving this RCIS's conservation goals and objectives.
- An evaluation of the effectiveness of conservation actions and habitat enhancement actions in offsetting identified threats to focal species and in achieving the strategy's biological goals and objectives.

MCA proponents must conduct monitoring of their conservation actions to determine whether they have met performance-based milestones that allow release of mitigation credits. MCA proponents provide these reports to CDFW, who must post them on-line. The implementation committee can use these public reports, and other data, to assess the progress and effectiveness of conservation actions in the RCIS area to contribute to the RCIS conservation goals and objectives.

4.2.2.2 Implementation Committee

The Authority may choose to team with other public agencies, organizations, or collaborators to form an RCIS implementation committee to 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,
- 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, and
- 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 chose 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

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 in the RCIS area.
- 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 will 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 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. 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.

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 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.
- Mitigation credits can be pooled across large sites or multiple sites, providing economies of scale to deliver mitigation more efficiently across many projects.
- An MCA provides certainty and predictability to the MCA sponsor for the future costs of project mitigation under state laws.
- 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.

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, large mitigation site with multiple phases, a suite of mitigation sites, or even a specific region (e.g., watershed boundary or municipality) within the RCIS area.

MCAs will primarily facilitate permitting under the California Endangered Species Act for RCIS focal species which are state listed, and other species whose conservation need is analyzed or otherwise provided for in this Santa Clara County RCIS. The MCA could be designed to satisfy a range of other state wildlife laws and regulations, including the California Environmental Quality Act (CEQA), and Lake or Streambed Alteration requirements of the CFGC. This also applies to nonfocal species of interest, particularly in the context of CEQA It is assumed that if conservation actions or habitat enhancement actions are aligned with the conservation goals and objectives of this RCIS and benefit nonfocal species, than those species could be included in an MCA as well (Section 2.4, *Nonfocal 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 permitting under their respective authorities.

4.3.1 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 established 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. CDFW must approve the release of all credits after the sponsor meets performance-based milestones established by the MCA.

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).
- Restoration of resources that creates new and/or increases existing habitat function for a focal species or species whose conservation need is analyzed or otherwise provided for in this Santa Clara County RCIS.
- Enhancement of focal species or other species whose conservation need is analyzed or otherwise provided for in this RCIS, habitat conditions, or habitat connectivity.

An MCA developed under an RCIS must also be consistent with any previously approved or amended RCIS, 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*). An MCA must also take into account any approved mitigation bank and available mitigation credits at these banks in the RCIS area (Section 4.3.2, *Conservation or Mitigation Banks*). The MCA must explain how available mitigation credits at approved banks will be purchased or used in combination with the MCA mitigation credits. If available bank credits will not be purchased or used, an MCA must explain why. More information on the MCA development and approval process can be found on the CDFW website for the RCIS program[2].

[2] https://www.wildlife.ca.gov/Conservation/Planning/Regional-Conservation

4.3.1.1 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*).
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.
3. 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.

4.3.2 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 (also see Appendix A, *Glossary*).

The goals of private mitigation banks are compatible with and support regional conservation strategies such as this Santa Clara County RCIS. See Section 2.3.1.3, *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.[3] The Santa Clara County RCIS can provide guidance on where mitigation or conservation banks could be established to support focal species.

4.3.3 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 States, second to mitigation banks. As defined in 33 CFR 332.2, an in-lieu fee program involves:

"…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. 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. If the RCIS Implementation Sponsor should seek to pursue coverage for aquatic resource impacts through the Habitat Agency's In-Lieu Fee Program, the In-Lieu Fee Program would need to be amended to accommodate the request.

4.4 Amending the RCIS

Under current state law, CDFW may extend the duration of an approved or amended RCIS for additional periods of up to 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.

[3] For additional information on banking see the following websites: <www.dfg.ca.gov/hcpb/conplan/mitbank/mitbank.shtml> and <www.fws.gov/sacramento/es/cons_bank.htm>.

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."

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

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).

4.5 Conservation Partners

This Santa Clara County RCIS provides a framework for identifying regional conservation priorities and actions for focal species and other conservation elements within the RCIS area. 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 in the RCIS area. As such, the RCIS applicant anticipates that a combination of conservation investments, conservation actions, 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.

To that end, 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.

- 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 (VTA)
- Santa Clara Valley Water District
- San Francisco Bay Restoration Authority
- San Francisquito Creek Joint Powers Authority
- Silicon Valley Land Conservancy
- 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.

Chapter 5
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5.1 Chapter 1

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5.2 Chapter 2

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Chapter 6
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