DRAFT

San Bernardino County Regional Conservation Investment Strategy

SAN BERNARDINO COUNTY

sb cog
san bernardino council of goverments

SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

December 2018

PREPARED BY

DUDEK

Draft

San Bernardino County
Regional Conservation Investment Strategy

Prepared for:

SAN BERNARDINO COUNTY

sb cog San Bernardino Council of Governments

SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

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EXECUTIVE SUMMARY

The San Bernardino County Regional Conservation Investment Strategy (SBC RCIS) is a voluntary, nonregulatory framework for conservation and mitigation actions in key regions of San Bernardino County, California. The County of San Bernardino, San Bernardino Council of Governments, and the Environment Element stakeholder group, in collaboration with the Southern California Association of Governments, developed the SBC RCIS based on a set of biological and planning principles that arose from the Countywide Vision planning process. In an effort to streamline mitigation decisions and generate the best conservation outcomes, the SBC RCIS was developed to provide a regional, science-based conservation guidebook for use by public agencies, the development community, environmental groups, other interested entities, and the public when planning and carrying out conservation and mitigation actions in the Valley and West Desert regions of San Bernardino County.

The SBC RCIS covers two subareas of San Bernardino County: the Valley subarea and the West Desert subarea. Within each subarea, the conservation strategy was built around conservation elements, including Focal Species and their habitats. Conservation elements in the Valley subarea include 13 general vegetation communities and 25 Focal Species and the landscape processes and features that support them. Conservation elements in the West Desert subarea include 17 general vegetation communities and 30 Focal Species and the landscape processes and features that support them.

Building off the landscape context and baseline biological information, the SBC RCIS is founded upon conservation goals and objectives that structure and focus the conservation strategy on priority actions and areas. The conservation actions toolbox provides the suite of actions available for RCIS users to select from based on their individual conservation or mitigation needs, and the prioritization guidelines provide decision support at a regional scale for optimizing the effectiveness of conservation and mitigation actions. Following approval by the California Department of Fish and Wildlife, the SBC RCIS can be used to support more informed conservation and mitigation decisions.

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1 INTRODUCTION

The following provides introductory information related to the development of the San Bernardino County Regional Conservation Investment Strategy (SBC RCIS), including a discussion of background, purpose and need, intended uses, RCIS area, conservation elements, planning process, relationship to other planning, and document content and organization.

1.1 Background

The San Bernardino Countywide Vision is a comprehensive planning effort developed by the County, local municipalities, and other stakeholders to identify and execute the vision for its future. The Countywide Vision statement and goals, as adopted by the County and the San Bernardino Associated Governments (SANBAG; now San Bernardino Council of Governments, SBCOG), are oriented around nine community elements: jobs/economy, education, housing, public safety, infrastructure, quality of life, environment, wellness, and image, and stakeholder groups were formed around each element to further the visioning process.

A primary initiative of the Environment Element Group (EE Group) is to "develop a more comprehensive approach to the preservation/conservation of habitat and open space throughout the county". The Countywide Habitat Preservation/Conservation Framework Development (Phase 1 Framework Study), which was completed in 2015, set the foundation for developing a conservation strategy for San Bernardino County (Dudek 2015). Importantly, the County, SBCOG, and EE Group in collaboration with the Southern California Association of Governments (SCAG) established the following *Policy* and *Biological Principles* for future conservation planning in the County.

Policy Principles

1. Increase certainty for both the preservation/conservation of habitat as well as for land development and infrastructure permitting.
2. Recognize that San Bernardino County needs to have a growing economy to be able to afford the acquisition and ongoing management of habitat. Conservation efforts should complement other objectives such as managed growth, economic development and housing affordability.
3. Institutional structures to promote habitat protection and management should be designed to leverage private funding, easements, public funding, and other mechanisms to maximize the protection of habitat and associated species.

4. Conservation planning efforts should be led by a funded institutional structure that can provide champions to keep the process moving in a transparent, productive and timely manner.
5. Recognize that participating in a more comprehensive approach to conservation planning will be voluntary, but that participating in the more comprehensive approach will provide benefits for most of those participating.
6. Leverage existing conservation efforts.
7. Match potential tools for conservation with unique conservation and development needs within specific subareas.
8. Consider conservation planning strategies that go outside the County boundaries, if needed.
9. Don't undermine existing conservation measures, such as mitigation banks and in-lieu fee programs.

Biological Principles

1. Recognize San Bernardino County is biologically diverse.
2. Invest in the science of conservation planning.
3. The identification of conservation areas should incorporate scientifically accepted tenets of conservation biology.
4. Consider current and future endangered, threatened, and sensitive species.
5. Identify mechanism for long term, sustainable, management and monitoring.
6. Manage public access to be compatible with conservation needs.
7. Conservation objectives in San Bernardino County can be achieved through a variety of conservation strategies.
8. Implementation mechanisms for identified conservation priority areas should produce effective rather than scattered conservation.

As the next phase of conservation planning work was proceeding in accordance with these principles, the new RCIS[1] planning tool became available that aligned well with the approaches being pursued by the County, SBCOG, SCAG, and the EE Group. In October 2016 and again in March 2017, the EE Group provided strong guidance to the County, SBCOG, and SCAG to

[1] The RCIS Program was established when Assembly Bill 2087 (AB 2087) was signed into law in September 2016 and became effective January 1, 2017. RCISs are codified in California Fish and Game Code Chapter 9, Section 1850, et seq.

pursue an RCIS for San Bernardino County. In October 2016, the San Bernardino County Board of Supervisors adopted Resolution No. 2016-189 authorizing the County to pursue an RCIS under AB 2087.

1.2 Purpose and Need

The purpose of the SBC RCIS is to inform science-based nonbinding and voluntary conservation and habitat enhancement actions for focal species, vegetation communities, ecological processes, and habitat connectivity and provide nonbinding voluntary guidance on conservation priority areas and actions to enhance streamlining and predictability of land development processes in the Valley and West Desert regions of San Bernardino County. The SBC RCIS will provide a coordinated strategy for conservation and mitigation in these key regions of the County considered high priority by the County, SBCOG, SCAG, and the EE Group due to the land uses, development pressures, and other stressors in these areas.

1.3 Intended Uses

The intent of the CDFW RCIS program, as described in California Fish and Game Code (CFGC) Section 1850, is to "promote science-based conservation, including actions to promote resiliency to the impacts of climate change and other stressors... [and] to create nonregulatory mechanisms to guide investments in conservation, infrastructure, and compensatory mitigation for impacts to natural resources, including impacts to threatened and endangered species, other sensitive species, natural communities, ecological processes, and connectivity. The intended use of the SBC RCIS is to provide a regional biological conservation guidebook to public agencies, the development community, environmental groups, other interested entities, and the public for science-based nonbinding and voluntary conservation and mitigation actions in the Valley and West Desert regions of San Bernardino County.

As stated in CFCG Section 1850(e-f), an RCIS is not intended "to regulate the use of land, establish land use designations, or to affect, limit, or restrict the land use authority of any public agency", and an approved RCIS would not be "binding on independent public agency action".

As stated in California Fish and Game Code (CFGC) Section 1855(a), an RCIS:

> *shall not affect the authority or discretion of any public agency and shall not be binding upon public agencies other than parties to a mitigation credit agreement. Nothing in this chapter increases or decreases the authority or jurisdiction of the [CDFW] regarding any land use, species, habitat, area, resource, plan, process, or corridor. Regional conservation investment strategies are intended to provide scientific information for the consideration of public agencies. Nothing in this*

> *chapter or any other provision of law requires any public agency, other than a public agency that is party to a mitigation credit agreement, to adopt, implement, or otherwise adhere to a regional conservation investment strategy.*

Additionally, as clarified in CFGC Section 1855(c), an RCIS shall not require:

> *a project proponent seeking to provide compensatory mitigation pursuant to [CFGC] Section 1602, 2080.1, 2081, or 2835 or the California Environmental Quality Act to undertake conservation actions or habitat enhancement actions identified in a regional conservation investment strategy; implement, contribute to, fund, or otherwise comply with the actions described in a regional conservation investment strategy; require or otherwise compel a project proponent to enter into a mitigation credit agreement; or use or purchase mitigation credits established pursuant to this chapter to satisfy the compensatory mitigation requirements.*

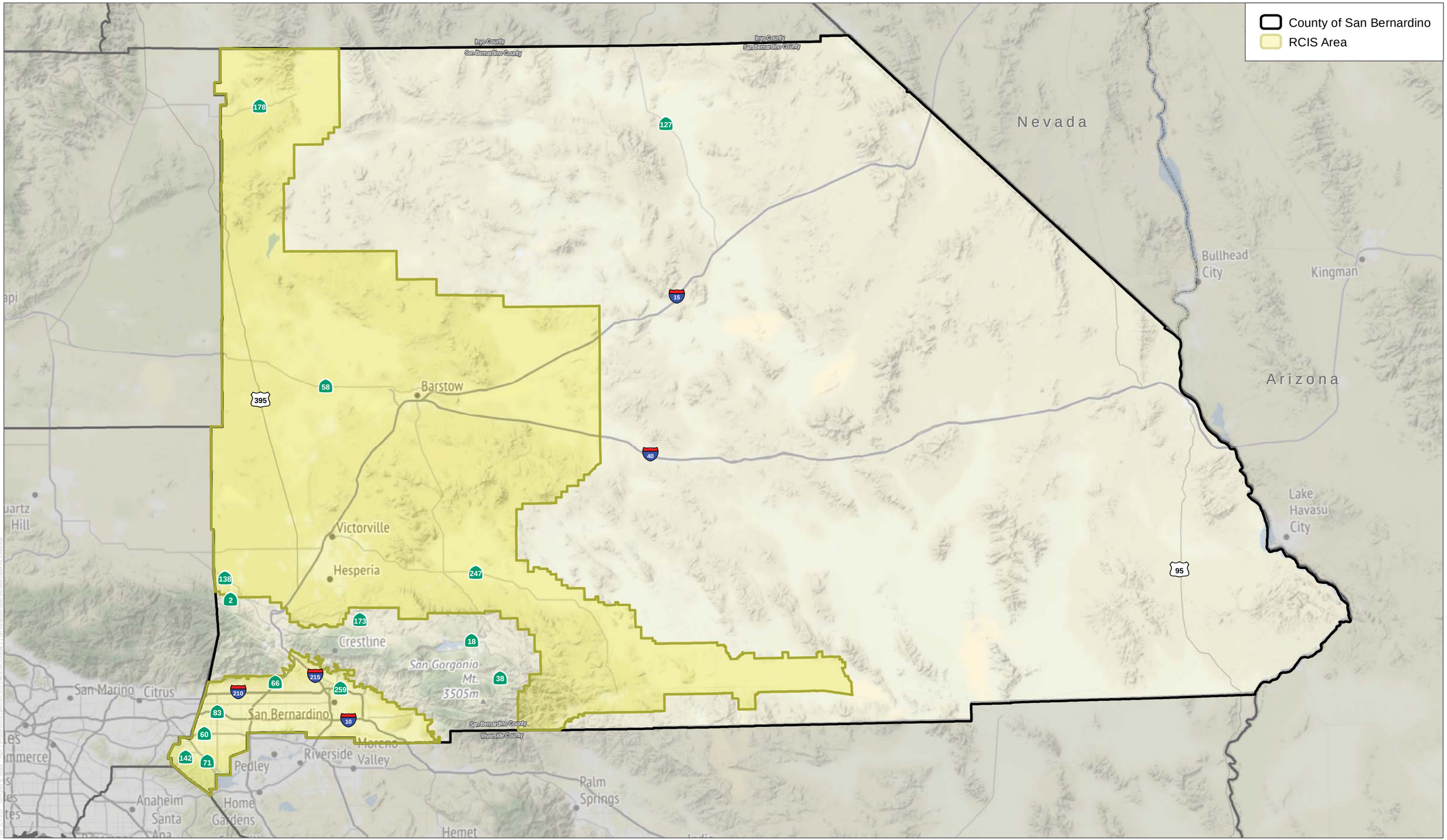
Further, CFGC Section 1855(e) states that CDFW:

> *shall not reject biologically appropriate and adequate compensatory mitigation proposed by a project proponent on the basis that the compensatory mitigation is not a conservation action or habitat enhancement identified in a regional conservation investment strategy.*

1.4 RCIS Area

The RCIS area is the geographic area encompassed by an RCIS. For the SBC RCIS, the RCIS area includes two subareas as shown on Figure 1-1, the Valley subarea and the West Desert subarea. The landscape context and setting for the RCIS area is provided in Section 2.

San Bernardino County spans nearly 13 million acres and developing an RCIS for the entire County was not considered necessary or feasible. In order to identify the preferred SBC RCIS area, the County, SBCOG, SCAG, and the EE Group first divided the County into RCIS planning subareas. Conservation planning subarea boundaries for the County were first studied as part of the Phase 1 Framework Study (Dudek 2015), which previously identified the "region" boundaries (i.e., valley, mountain, desert) as useful subdivisions for the County. For the purpose of developing the RCIS subareas, the desert region was further subdivided into West Desert and East Desert resulting in four total RCIS planning subareas: Valley, Mountain, West Desert and East Desert. The relationship of these planning boundaries to ecoregional boundaries is discussed in Section 2.1.



SOURCE: Bing Maps 2018; San Bernardino County 2018

DUDEK

0 42,000 84,000 Feet

FIGURE 1-1

San Bernardino Valley and West Desert RCIS Area

San Bernardino County RCIS

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The Valley and West Desert subareas were considered highest priority for inclusion in the SBC RCIS because these subareas would benefit greatest from a coordinated regional conservation and mitigation strategy. The biological resources of greatest conservation concern and interest in the Valley and West Desert subareas are largely unprotected and occur on lands within local land use jurisdiction where the RCIS strategy can provide the greatest conservation and mitigation streamlining benefits (see Section 2.6 for details on land ownership, designations, and jurisdiction).

Although the Mountain subarea of the County is not formally addressed as part of the RCIS area, the San Bernardino mountain region is a characteristic element of the San Bernardino County landscape that supports unique habitat areas for plant and animal species and provides critical functions for habitat connectivity and climate change resiliency and adaptation. The resources and functions of the Mountain subarea are addressed and referred to, as necessary, as they pertain to SBC RCIS conservation strategy for the Valley subarea and for the West Desert subarea (see Section 3 Conservation Strategy). The mountain foothills, which are areas of both development and conservation interest, are included in the Valley and West Desert subareas of the SBC RCIS.

The Mountain subarea is primarily USDA Forest Service land managed according to their three-tier land and resource management program: the Southern California National Forests Vision (USDA FS 2005a), the forest-specific land management plan for the San Bernardino National Forest (USDA FS 2005b), and design criteria for implementing management plan actions. Land management plan monitoring reports are issued annually to document and track implementation of the program. Further, the Ecological Restoration Implementation Plan (USDA FS 2013) sets out the Forest Service Pacific Southwest Region's vision for the implementation of stewardship actions in the wildlands and forests of southern California for the next 15-20 years, including a specific set of actions for the San Bernardino National Forest. The overall purpose of the multi-tiered land management program is to "articulate the long-term vision and strategic management direction for each southern California national forest,…facilitate the development of management activities that will contribute toward the realization of the national forests' desired conditions, [and] offer the flexibility to adapt decisions to accommodate rapidly changing resource conditions" (USDA FS 2005). The existing USDA Forest Service land management program is an established conservation strategy being implemented for the benefit of the plant and animal species, vegetation communities, and ecological processes of the San Bernardino National Forest, and development of an RCIS that overlapped with this existing program was not considered a priority at this time. See Section 1.6 for a discussion of relationship of the SBC RCIS to other planning and Section 2.7 for a description of other resource conservation and management plans and programs.

Although the East Desert subarea of the County is not formally addressed as part of the RCIS area, the East Desert region supports important areas for plant and animal habitat and important landscape processes and functions. The resources, processes, and functions of the East Desert subarea are addressed and referred to, as necessary, as they pertain to the SBC RCIS conservation strategy for the West Desert subarea (see Section 3 Conservation Strategy). The East Desert subarea is primarily military, Bureau of Land Management, National Park Service, and State Lands Commission land managed according to agency-specific policies, processes, and programs. Through the planning process to develop the boundary for SBC RCIS area, the West Desert subarea was expanded to encompass EE Group priority areas including the Morongo Basin, Lucerne Valley, and the Ord-Rodman desert tortoise area. See Section 1.6 for a discussion of relationship of the SBC RCIS to other planning and Section 2.7 for a description of other resource conservation and management plans and programs.

The SBC RCIS conservation and mitigation approaches, strategies, and tools are not be geographically limited by the boundary of the RCIS area. Therefore, the boundary of the RCIS area does not in any way dictate or restrict where projects impacts or mitigation can or should occur. Additionally as described in CDFW RCIS Guidelines, an RCIS may be amended at any time after its initial approval to incorporate additional geographic areas (CDFW 2017).

1.5 Conservation Elements

As defined in CDFW 2017, conservation elements are elements with ecological functions within an RCIS that are the focus of the RCIS conservation strategy. For the purposes of the SBC RCIS, the conservation elements are organized into landscape process and features, vegetation communities, and Focal Species. In the Valley subarea, the conservation elements are the 13 general vegetation communities and 25 Focal Species and the landscape processes and features that support them (see Section 3.1.1). In the West Desert subarea, the conservation elements are the 17 general vegetation communities and 30 Focal Species and the landscape processes and features that support them (see Section 3.1.2).

1.6 Planning Process

As briefly described above under the RCIS background, the RCIS planning process arose from San Bernardino Countywide Vision process. The County, SBCOG, and EE Group, in collaboration with SCAG, are the lead planning team for the RCIS. The EE Group is a multi-disciplinary stakeholder group comprised of representatives from local municipalities and districts; staff from federal, state, and local agencies; development and industry community representatives; staff from non-governmental organizations; and the interested public.

The County, SBCOG, and SCAG developed the draft SBC RCIS with support from Dudek and with input throughout the process from the EE Group, other interested entities, and the public. EE Group meetings where held regularly prior to RCIS development and during the development of the draft SBC RCIS in September 2016, March 2017, and November 2017. On October 4, 2016, the Board of Supervisors of San Bernardino County passed Resolution Number 2016-189 authorizing the County of San Bernardino, in collaboration with SANBAG (now SBCOG) and SCAG, to pursue an RCIS under the establish Assembly Bill 2087. This marked the date the SBC RCIS was officially initiated. CFGC Section 1854 describes the review and approval process for an RCIS. As specified in CFGC Section 1854(c)(1), public agencies developing an RCIS typically would be required to file a notice of intent (NOI) with the Governor's Office of Planning and Research; however, an NOI is not necessary for the SBC RCIS because it was initiated prior to 2017.

As envisioned by the RCIS legislation and as codified in CFGC Chapter 9, Section 1850, et seq., Regional Conservation Assessments (RCAs) may optionally be prepared to support RCIS development. An RCA is an assessment that provides information and analyses that document the ecosystems, ecosystem functions, species, habitat, protected and conserved areas, and habitat linkages within an ecoregion to provide the appropriate context for nonbinding, voluntary conservation strategies and actions (CDFW 2017). As noted in the RCIS background provided in Section 1.1, early planning work supporting the SBC RCIS included the Phase 1 Framework Study (Dudek 2015) which included data gathering, outreach, and development of a conservation framework that contained many of the elements of an RCA. Additionally, numerous resource conservation and management plans and programs have been developed in the SBC RCIS area, as listed in Section 2.6, that were used to inform development of the SBC RCIS. As noted in Section 2.6, an RCA for the Mojave ecoregion is currently being developed by the California Strategic Growth Council. The County, SBCOG, and SCAG coordinated with the California Strategic Growth Council during development of the SBC RCIS, and the SBC RCIS and the Mojave RCA (in development) are considered complementary and consistent.

Upon submittal of the Draft RCIS to CDFW, CDFW has 30 days to determine if the Draft RCIS is complete. Upon determination of a complete Draft RCIS, CDFW will post the Draft RCIS to website for a minimum 30-day public review and comment period. At least 60 days prior to submittal of a Final RCIS, counties and cities in the RCIS are to be notified. Based on comments from CDFW, counties, and cities, and the public, the Draft RCIS would be revised and the Final RCIS would be submitted to CDFW for approval.

The RCIS legislation and CFGC Chapter 9, Section 1850, et seq. also describe mitigation credit agreements (MCAs) as part of the overall RCIS program. MCAs are agreements that may be developed between CDFW and one or more persons or entities that identifies the types and

numbers of credits the person(s) or entity(ies) proposes to create by implementing one or more conservation actions or habitat enhancement actions (CDFW 2017). MCAs may only be developed within approved RCIS areas. The SBC RCIS has been prepared with the information required to support potential future MCA development.

1.7 Relationship to Other Planning

Numerous programs and planning efforts addressing biological resources and land uses in San Bernardino County have been developed at the federal, state, and local levels. At the federal level, the RCIS area includes military lands, Bureau of Land Management (BLM) lands, Forest Service lands, and National Park Service lands. The RCIS also includes California State Parks land, California State Lands Commission (CSLC) lands, and CDFW-owned lands. Further, the RCIS area includes tribal lands, lands owned by local governments, and private lands. Lands under the jurisdiction of local governments include unincorporated County lands and lands within cities and towns, including Adelanto, Apple Valley, Barstow, Chino, Chino Hills, Colton, Fontana, Grand Terrace, Hesperia, Highland, Loma Linda, Montclair, Ontario, Rancho Cucamonga, Redlands, Rialto, San Bernardino, Twentynine Palms, Upland, Victorville, Yucaipa, and Yucca Valley. See Section 2.6 for detailed information on land ownership, designations, and jurisdictions within San Bernardino County.

As described above in Section 1.3 Intended Uses, the SBC RCIS does not affect the authority or discretion of any public agency and is not be binding upon public agencies. Therefore, the SBC RCIS does not change in any way the land use policies, designations, decisions, or recommendations of other federal, state, or local planning. See Section 2.7 for a description of the existing resource conservation and management plans and programs in and around the RCIS area.

1.8 Document Content and Organization

The SBC RCIS was developed consistent with the legislative requirements of the RCIS program and the CDFW RCIS guidelines (CDFW 2017). The following lists the required components of an RCIS based on CFGC 1852(c) (in *italics*) and the location of this information in the SBC RCIS.

(1) An explanation of the conservation purpose of and need for the strategy.

SBC RCIS Section 1.1 and 1.2

(2) The geographic area of the strategy and rationale for the selection of the area, together with a description of the surrounding ecoregions and any adjacent protected habitat areas or linkages that provide relevant context for the development of the strategy.

SBC RCIS Section 1.4 (Intended Uses) and Section 2 (Landscape Context and Setting)

(3) The focal species included in, and their current known or estimated status within, the strategy.

SBC RCIS Section 3.1 (Conservation Elements) and Appendix A (Focal Species Summaries)

(4) Important resource conservation elements within the strategy area, including, but not limited to, important ecological resources and processes, natural communities, habitat, habitat connectivity, and existing protected areas, and an explanation of the criteria, data, and methods used to identify those important conservation elements.

SBC RCIS Section 3.1 (Conservation Elements)

(5) A summary of historic, current, and projected future stressors and pressures in the strategy area, including climate change vulnerability, on the focal species, habitat, and other natural resources, as identified in the best available scientific information, including, but not limited to, the State Wildlife Action Plan.

SBC RCIS Section 2.8 (Regional Pressures and Stressors) and Appendix A (Focal Species Summaries)

(6) Consideration of major water, transportation and transmission infrastructure facilities, urban development areas, and city, county, and city and county general plan designations that accounts for reasonably foreseeable development of major infrastructure facilities, including, but not limited to, renewable energy and housing in the strategy area.

SBC RCIS Section 2.7 (Land Uses and Reasonably Foreseeable Development)

(7) Provisions ensuring that the strategy will be in compliance with all applicable state and local requirements and does not preempt the authority of local agencies to implement infrastructure and urban development in local general plans.

SBC RCIS Section 1.3 (Intended Uses), Section 3.4 (Conservation and Mitigation Actions and Priorities), and Section 4 (Implementation Framework)

> *(8) Conservation goals and measurable objectives for the focal species and important conservation elements identified in the strategy that address or respond to the identified stressors and pressures on focal species.*

SBC RCIS Section 3.3 (Conservation Goals and Objectives)

> *(9) Conservation actions, including a description of the general amounts and types of habitat that, if preserved or restored and permanently protected, could achieve the conservation goals and objectives, and a description of how the conservation actions and habitat enhancement actions were prioritized and selected in relation to the conservation goals and objectives.*

SBC RCIS Section 3.4 (Conservation and Mitigation Actions and Priorities)

> *(10) Provisions ensuring that the strategy is consistent with and complements any administrative draft natural community conservation plan, approved natural community conservation plan, or federal habitat conservation plan that overlaps with the strategy area.*

SBC RCIS Section 2.6 (Other Resource Conservation and Management Plans and Programs), Section 3.3 (Conservation Goals and Objectives), Section 3.4 (Conservation and Mitigation Actions and Priorities), and Section 4 (Implementation Framework)

> *(11) An explanation of whether and to what extent the strategy is consistent with any previously approved strategy or amended strategy, state or federal recovery plan, or other state or federal approved conservation strategy that overlaps with the strategy area.*

SBC RCIS Section 2.6 (Other Resource Conservation and Management Plans and Programs), Section 3.3 (Conservation Goals and Objectives), Section 3.4 (Conservation and Mitigation Actions and Priorities), and Section 4 (Implementation Framework)

> *(12) A summary of mitigation banks and conservation banks approved by the department or the United States Fish and Wildlife Service that are located within the strategy area or whose service area overlaps with the strategy area.*

SBC RCIS Section 2.6 (Other Resource Conservation and Management Plans and Programs)

> *(13) A description of how the strategy's conservation goals and objectives provide for adaptation opportunities against the effects of climate change for the strategy's focal species.*

SBC RCIS Section 3.3 (Conservation Goals and Objectives)

> *(14) Incorporation and reliance on, and citation of, the best available scientific information regarding the strategy area and the surrounding ecoregion, including a brief description of gaps in relevant scientific information, and use of standard or prevalent vegetation classifications and standard ecoregional classifications for terrestrial and aquatic data to enable and promote consistency among regional conservation investment strategies throughout California.*

SBC RCIS Section 2 (Landscape Context and Setting), Section 3.1 (Conservation Elements), Section 3.2 (Conservation Analysis), Section 6 (References), Appendix A (Focal Species Summaries), and Appendix B (Key Data Summaries).

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2 LANDSCAPE CONTEXT AND SETTING

San Bernardino County spans the valley, mountain, and desert regions of Southern California containing unique and varied landscape processes and features that support a rich and diverse assemblage of vegetation communities and plant and wildlife species. This section provides an overview of the broad landscape context and setting within which the SBC RCIS for the Valley subarea and West Desert subarea was developed. The landscape context and setting for the SBC RCIS includes a description of ecoregions (Section 2.1) and climate (Section 2.2), geomorphology, topography, and soils (Section 2.3), hydrology (Section 2.4), land ownerships designations, and jurisdictions (Section 2.5), other resource conservation and management plans and programs (Section 2.6), land uses and reasonably foreseeable development (Section 2.7), and regional pressures and stressors (Section 2.8),. Figure 2-1 provides a reference map for place names and other features referenced in this section and throughout the document.

2.1 Ecoregions

San Bernardino County (County) is geographically divided into the valley region, the mountain region, and the desert region. These geographic divisions generally follow ecoregional boundaries defined by the USDA with the valley and mountain regions occurring in the Southern California Mountains and Valleys ecoregion section and the desert region occurring in the Mojave Desert ecoregion section (USDA 2007), as shown on Figure 2-2. For the purposes of RCIS planning, the desert region was split into west and east resulting in four RCIS subareas for the County: the Valley subarea, the Mountain subarea, the West Desert subarea, and the East Desert subarea. This RCIS addresses the Valley and West Desert subareas of the County.

The Valley subarea of the County is located in the inland coastal plain south of the San Bernardino and San Gabriel Mountains. The Valley is the most populated region of the County and is located in the southwest portion of the County that extends to Riverside County to the south, Orange County to the southwest, and Los Angeles County to the west. The Valley subarea is primarily located in the Fontana Plain-Calimesa Terraces ecoregion subsection; the Santa Ana Mountains and the Perris Valley and Hills ecoregion subsections overlap with the southern edges of the Valley subarea (USDA 2007).

The Mountain subarea separates the Valley region from the Desert region of the County and is characterized by predominantly National Forest lands. The San Gorgonio Mountains and San Gabriel Mountains ecoregion subsections comprise the Mountain subarea (USDA 2007).

The Desert region is the largest of the three geographic regions and occurs north of the San Bernardino and San Gabriel Mountains, extending east to the Arizona state line. Kern and Los Angeles Counties are located to the west, with Inyo County and the Nevada state line to the north

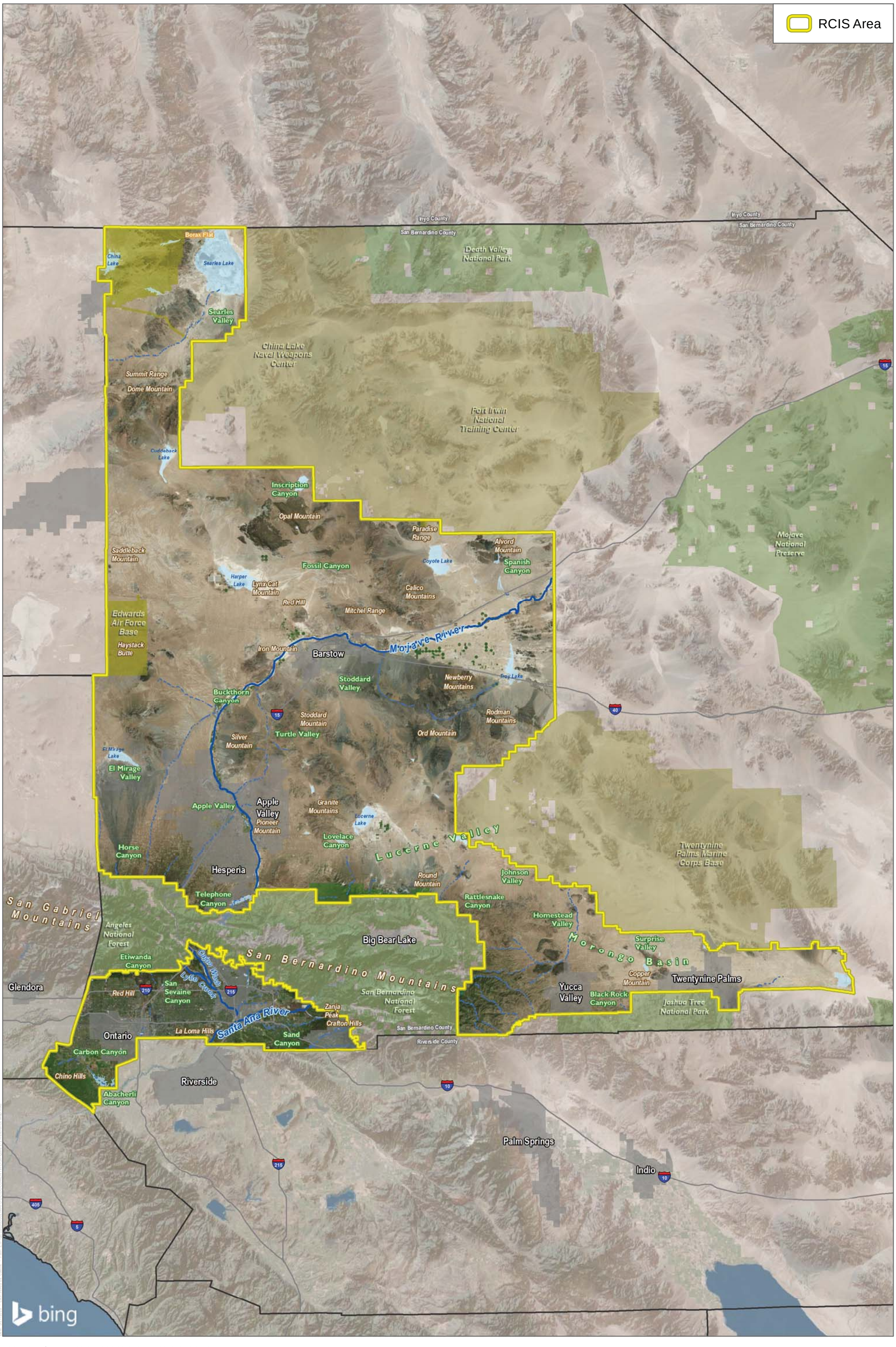
and east. West Desert was separated from East Desert in consideration of ecoregion boundaries as well as land ownership patterns. In the north, the eastern edge of the West Desert subarea is the boundary for Army's Fort Irwin National Training Center. In the central portion of the County, the West Desert was separated from the East Desert where BLM Wilderness Study Area and the Mojave National Preserve boundaries begin east of Newberry Springs. In the south, West Desert subarea includes the Morongo Basin north of Joshua Tree National Park and excludes Marine Corps Air Ground Combat Center Twentynine Palms. The West Desert subarea is predominantly located in the Mojave Desert ecoregion section. Foothills of the Little San Bernardino – Bighorn Mountain and San Gorgonio Mountain ecoregion subsections also occur in the West Desert subarea. The East Desert subarea occurs in the Mojave Desert and Sonoran Desert ecoregion sections (USDA 2007).

2.2 Climate

Climate varies considerably across the RCIS Area. The Valley region of the County has a Mediterranean climate, with hot, dry summers and cool winters. Summers are warm with the average daily maximum temperatures in July and August reaching approximately 96°F (WRCC 2017b). In the Valley, the City of San Bernardino receives an average of approximately 16 inches of rain annually, with the majority rainfall occurring November through April and in occasional thunderstorms during the summer months (WRCC 2017b).

In the Mountain region, annual rainfall amounts for the San Bernardino Mountains average approximately 22 inches near Big Bear Lake with an average of 62 inches of snowfall (WRCC 2017a). The majority of precipitation in the mountain region occurs between November and March. Summers are relatively dry with few thunderstorms. In winter months, snow typically occurs above 3,000 feet amsl and is frequent above 5,000 feet amsl. Rainfall and snowmelt in the mountains is a crucial source for the regional streams and rivers that feed the Santa Ana River and Mojave River.

Climate variability within the Desert region is influenced by elevation, topography, latitude, and proximity to water bodies. The desert climate is characterized by hot, dry summers and mild to cold winters. Precipitation events are primarily from winter frontal storms moving east off the Pacific Ocean, and sporadic summer convective monsoons. Winter storms generally bring widespread rainfall of longer duration, and lower intensity than summer monsoons, which generate isolated, high-intensity, short duration rainfall. The Mojave Desert is considered a "cold" or winter desert, with about 50% to 70% of annual precipitation occurring during the winter (Redmond 2009; Lichvar and McColley 2008). The Desert region experiences more extreme temperature variations than the other regions (Randall et al 2010; Webb et al. 2009).



SOURCE: Bing Maps 2018; USGS 2018; CDFW 2018; CEC 2018

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0 12.5 25 Miles

FIGURE 2-1

Reference Map

San Bernardino County RCIS

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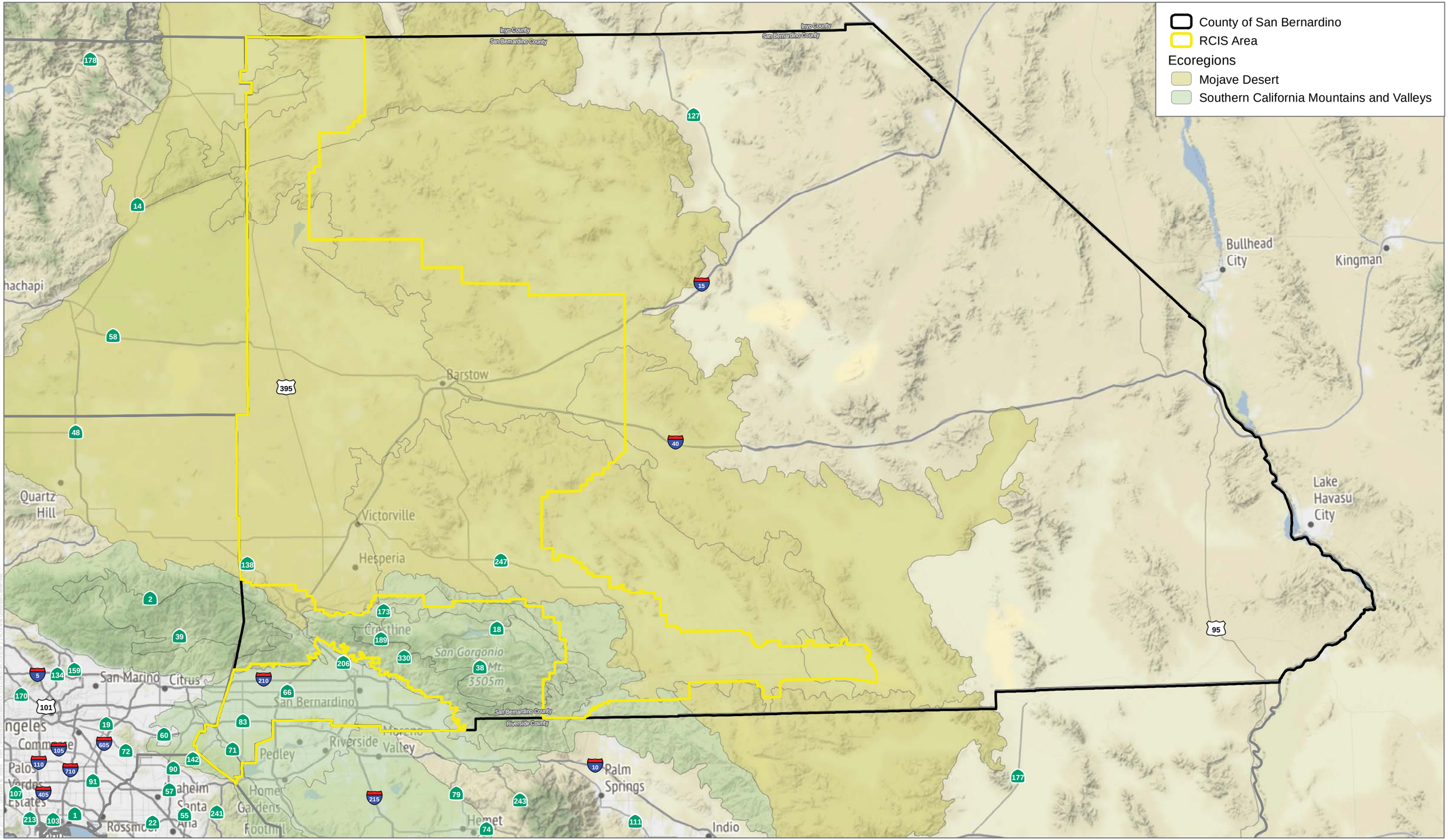

SOURCE: ESRI 2018; USDA 2018

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FIGURE 2-2

RCIS Area Landscape Context

San Bernardino County RCIS

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In addition to being geographically and seasonally variable, rainfall amounts are also related to topography and elevation. Annual rainfall within the valleys of the Mojave Desert range from approximately 2 to 5 inches and annual rainfall ranges from 10 to 30 inches in the mountain ranges (Redmond 2009). Inter-annual climate variability in the Mojave Desert is also related cyclical processes including El Niño Southern Oscillation (ENSO) and drought cycles.

2.3 Geomorphology, Topography, and Soils

Landforms and topography of the RCIS area are shown in Figure 2-3. The Valley region is composed of inland coastal plain and mountain foothills. Elevation in the Valley subarea ranges from approximately 4,000 feet amsl above Rancho Cucamonga to around 500 feet amsl in the Prado Basin. A majority of the topography in the Valley region is flat to gently rolling. More varied topography and landforms in the Valley are found in the Santa Ana Mountain foothills of the Chino Hills State Park in the southwest, the Loma Linda Hills and Crafton Hills in the southeast, and the San Gabriel and San Bernardino Mountain foothills that bound the Valley to the north. The Valley region contains a variety of soil types and textures primarily composed of alluvium derived from granite (USDA 2015). Alluvial deposits and active fluvial processes combine in the Valley region where hydrologic features like the Santa Ana River, Cajon Wash, Lytle Creek, and other tributaries drain from the San Bernardino Mountains into the Valley basin.

The Valley region also contains the Colton Dunes (composed of the Delhi soil series) that provide habitat for the Delhi sands flower-loving fly once covered approximately 40 square miles in northwestern Riverside and southwestern San Bernardino counties. Currently, the dunes occur only in fragmented areas in the southern portion of the Valley around Colton, Rialto, and Fontana, likely as a result of disconnection from wind-blown sand sources (USFWS 1997a).

The Mountain region is comprised of the San Bernardino and San Gabriel mountain ranges that both rise above 10,000 feet amsl and descend gradually to the Mojave Desert to the north and the Valley region to the south. These mountains are part of the Transverse Ranges of the Southern California mountain chain. Geomorphology of the Mountain region is characterized of steep slopes and ridgelines dissected by deep canyons with unstable hillslope rock debris (USGS 2006). This region has a variety of shallow soil types primarily consisting of decomposed granite and sandy loam (USDA 2015). An endemic geologic feature of this area is the presence of the pebble plains. These areas are the fragmented remains of a Pleistocene lake bed and are composed of discrete “islands” of clay soils covered with quartzite pebbles (71 FR 67712 et seq.). The combination of this rare soil series and the oscillating temperatures within the mountains results in unique habitat for rare and threatened plant species in the region (Krantz 1987). Carbonate soils, or soils with higher alkalinity, can also be found in various portions of the Mountain region; most notably from White Mountain to Blackhawk Mountain, including the limestone cliffs of Cushenbury Canyon. Carbonate soils also provide habitat for rare and threatened plant species.

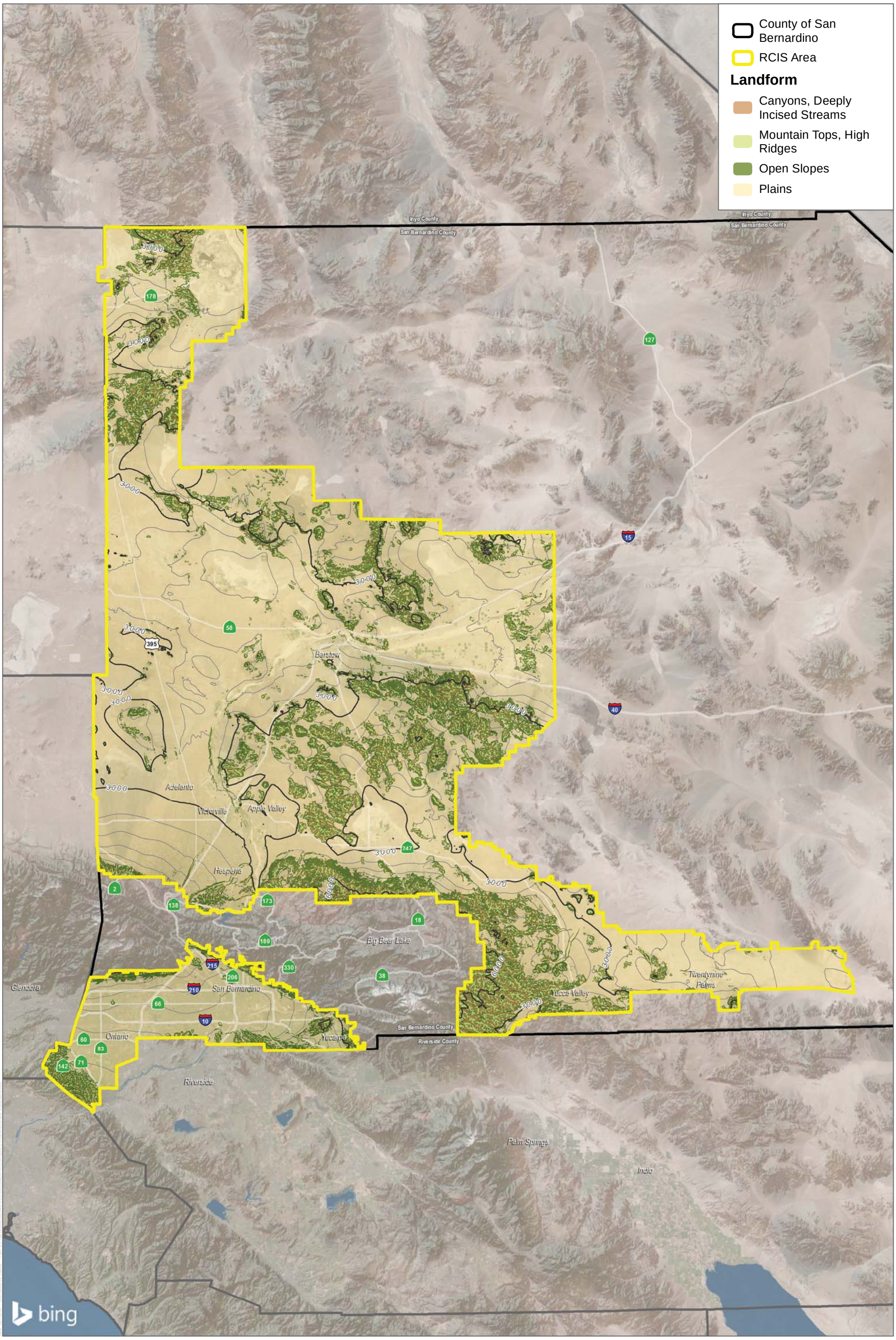
The Desert region is primarily characterized by low elevation, remote mountain ranges surrounded by desert plains. These mountains ranges often have alluvial fans associated with them, where a fan-shaped buildup of sediment protrudes from the base of the of mountains toward the valley floor. Alluvial fans originate from flashflood debris and stream sediment accretion (Harden 2004). Other significant landforms within the desert include mountains, plateaus, basins, dunes, and playas. The western portion of the Desert region is characterized primarily by relatively flat desert plains with elevations around 3,000 feet amsl with scattered low-elevation mountains ranging up to about 4,500 feet amsl. Geomorphological landforms in the Desert region are shaped by Aeolian (wind) processes; fluvial, alluvial, and lacustrine (water) processes; and mass-wasting (gravity) processes (Miller et al. 2009). Alluvial fans are formed primarily through fluvial and debris flow processes; dunes and sand sheets are formed through Aeolian processes; playas and washes are formed through fluvial, lacustrine, and Aeolian processes; and hillslope materials are formed primarily through mass-wasting.

2.4 Hydrology

The dominant aquatic feature within the Valley region is the Santa Ana River. The upstream reaches of the Santa Ana River watershed originate in the San Bernardino Mountains, and the entire Valley region is located within this watershed. The Santa Ana River is the largest river fully contained within Southern California. It begins in the San Bernardino Mountains before passing through Seven Oaks Dam in the foothills above the Valley. The river then flows 96 miles to the Pacific Ocean, alternating between its natural state and being contained in flood control channels. Key tributaries within the area include City Creek, Day Creek, Etiwanda Creek, Plunge Creek, San Sevaine Creek, Lytle Creek, Cajon Wash, San Timoteo Wash, and Mill Creek.

The southern and western portions of the Mountain region are part of the Santa Ana River watershed, and the northern portion of the Mountain region is part of the Mojave River watershed. The Mountain region has several large lakes where water is captured and stored: Big Bear Lake, Lake Arrowhead, and Silverwood Lake. Numerous creeks and tributaries drain the Mountain region, including Grass Valley Creek, Kinley Creek, Willow Creek, and Deep Creek.

The major hydrologic feature of the West Desert is the Mojave River. The Mojave River is an intermittent river, with the majority of the water flow occurring underground. The river's source starts within the San Bernardino Mountains and terminates at Soda Lake approximately 110 miles to the northeast. Though water in the Mojave River flows primarily underground, it comes to the surface in areas with impermeable rock substrata, such as the upper and lower narrows near Victorville and in the Afton Canyon area northeast of Barstow.



SOURCE: Bing Maps 2018; San Bernardino County 2018

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FIGURE 2-3

Landforms and Topography

San Bernardino County RCIS

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Other linear drainage channels occur throughout the San Bernardino foothills and desert mountains in the West Desert, and flowing surface water in these features (e.g., discontinuous ephemeral channels in alluvial fans, braided channels) is infrequent and usually the result of precipitation and flash-flood events. Other important hydrologic features of the West Desert include dry lakes/playas (e.g., Searles, Harper, El Mirage, and Lucerne) and seeps/springs. Anthropogenic modifications to hydrology from urbanization, water conveyance, and storage also exist within the Desert region. Major hydrologic features in the RCIS area are shown on Figure 2-4.

2.5 Land Ownerships, Designations, and Jurisdictions

San Bernardino County is characterized by a complex mixture of various land ownerships, designations, and jurisdictions (Figure 2-5 and Figure 2-6). Table 2-1 summarizes the land ownership patterns in San Bernardino County. The Valley subarea of the RCIS is nearly all private land (94%). Approximately 3% of the Valley subarea is comprised of State lands (Chino Hills State Park), and the remainder of the Valley is made up of federal, local government, and tribal lands. The West Desert subarea of the RCIS is characterized by approximately 58% public lands and 42% private lands. Public lands are predominantly Bureau of Land Management (BLM)-administered lands, which make up 49% of the West Desert subarea.

Table 2-1
Land Ownership in San Bernardino County

Land Ownership	RCIS Area		Elsewhere in San Bernardino County		Total
	Valley	*West Desert*	*Mountain*	*East Desert*	
Federal	**4,533**	**1,829,302**	**453,058**	**8,128,994**	**10,415,888**
Military	2,358	231,004	360	2,016,796	2,250,518
Bureau of Land Management	1,033	1,580,107	725	4,277,014	5,858,878
Fish and Wildlife Service	--	--	--	6,354	6,354
National Park Service	--	118	--	1,822,998	1,823,116
Bureau of Reclamation	--	--	--	5,833	5,833
Forest Service	1,142	18,073	451,973	--	471,188
State	**10,919**	**43,821**	**3,546**	**204,999**	**263,285**
Local Government	**2,772**	**603**	**10**	**53**	**3,437**
Tribal	**171**	**163**	**636**	**62,570**	**63,539**
Private	**301,183**	**1,382,979**	**81,748**	**355,770**	**2,121,680**
Total	**319,578**	**3,256,867**	**538,998**	**8,752,385**	**12,867,828**

Notes: Land ownership derived from the San Bernardino County Plan Base, which is a composite geographic information system (GIS) layer created for the San Bernardino Countywide Plan and used in the SBC RCIS to characterize and map land ownership, jurisdiction, and designations and is based on existing data from the County, SANBAG, BLM, State Parks, USPAD, and CPAD. The acreage summary provided here is approximate and intended to support landscape-scale assessment of land ownership patterns in the County. Land ownership data differs in quality, resolution, and accuracy from different sources; every effort was made to use data from authoritative sources.

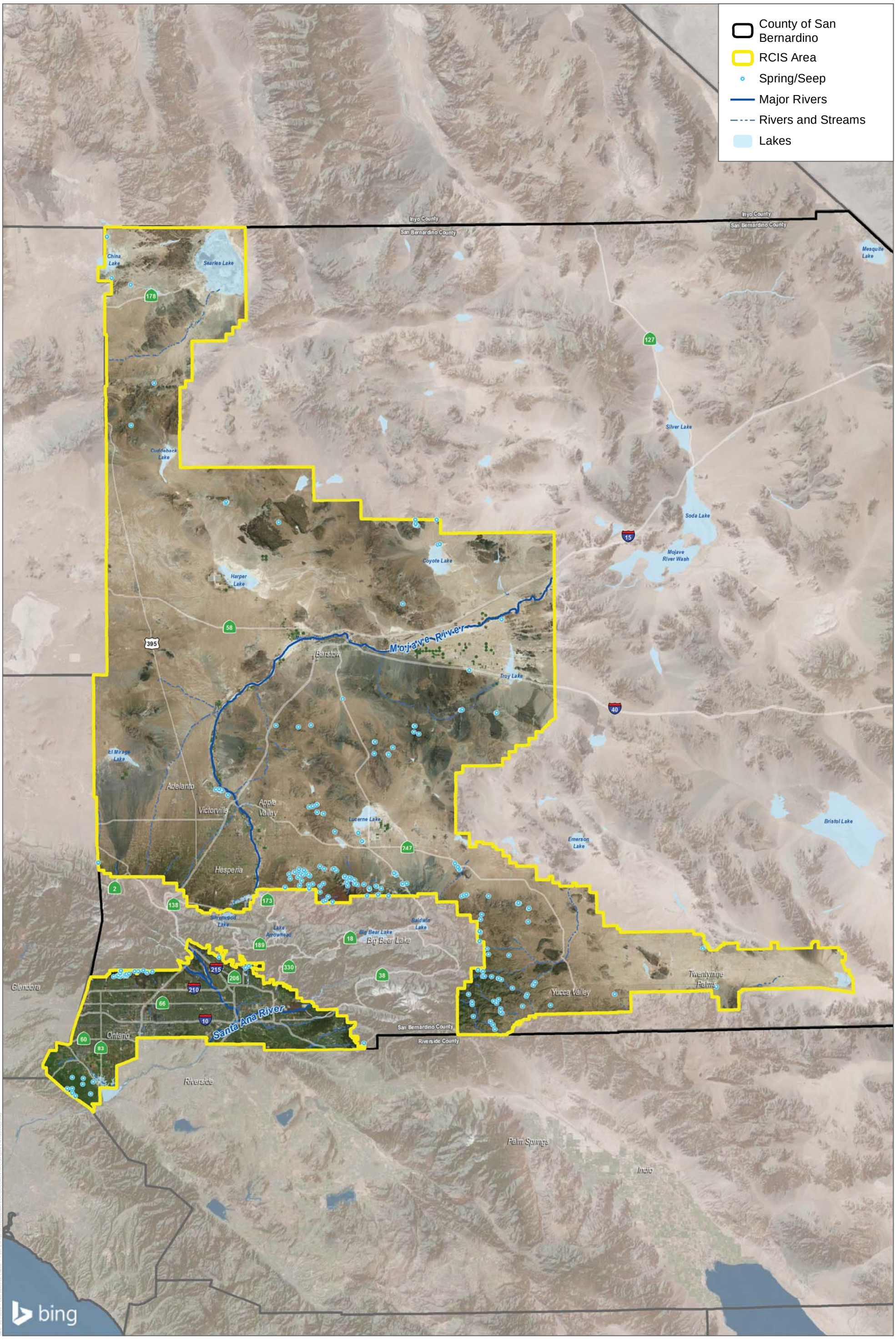
Using the Plan Base[2] and the Local Conserved Land[3] layers created for San Bernardino County, Table 2-2 summarizes the RCIS Area based on the following groupings of land designations.

- **Public Land–Protected Areas:** Include National Monuments, National Parks, National Preserves, National Refuges, BLM Wilderness areas, BLM National Conservation Lands, CDFW Lands, and California State Parks. These areas are considered permanently protected and managed for resource conservation.
- **Local Conserved Lands:** Include mitigation banks, land trust lands, and other conservation easements in the RCIS Area. These areas are considered permanently protected and managed for resource conservation.
- **Public Land–Multiple Use:** Includes National Forest lands, BLM Areas of Critical Environmental Concern (ACECs), and other undesignated federal, state, and local government lands. These areas are considered permanently protected and managed for multiple uses.
- **Other Open Space and Parks:** Includes other lands maintained in open space or for park uses. These areas are considered permanently protected and managed for multiple uses.
- **Military:** Lands administered by the Department of Defense.
- **Tribal:** Tribal lands.
- **Undesignated:** Largely private lands with no resource protection or management designation.

As Table 2-2 shows, nearly 90% of the Valley subarea of the RCIS Area is undesignated with no identified resource protection/management designation. This contrasts with the West Desert subarea of the RCIS area that is 16% protected public land and local conserved land and 36% multiple use public land and other open space and parks. Approximately 40% of the West Desert is undesignated with no identified resource protection/management designation. Elsewhere in the County, 85% of the Mountain area and 73% of the East Desert is covered by public land designations (multiple use and protected).

[2] Plan Base is a composite geographic information system (GIS) layer created for the San Bernardino Countywide Plan and used in the SBC RCIS to characterize and map land ownership, jurisdiction, and designations and is based on existing data from the County, SANBAG, BLM, State Parks, USPAD, and CPAD.

[3] Local Conserved Land is a composite GIS layer created for the San Bernardino Countywide Plan and used in the SBC RCIS to characterize, map, and track locally conserved lands in the County, including lands conserved by The Nature Conservancy, Wildlands, Mojave Desert Land Trust, Transition Habitats Conservancy, Inland Empire Resource Conservation District, Land Veritas, San Bernardino Department of Public Works, City of Fontana, City of Rancho Cucamonga, City of Colton, and the other land conserved via conservation easement including as inventoried by the California Conservation Easement Database.



SOURCE: Bing Maps 2018; USGS NHD 2018; CEC 2018

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FIGURE 2-4

Hydrology

San Bernardino County RCIS

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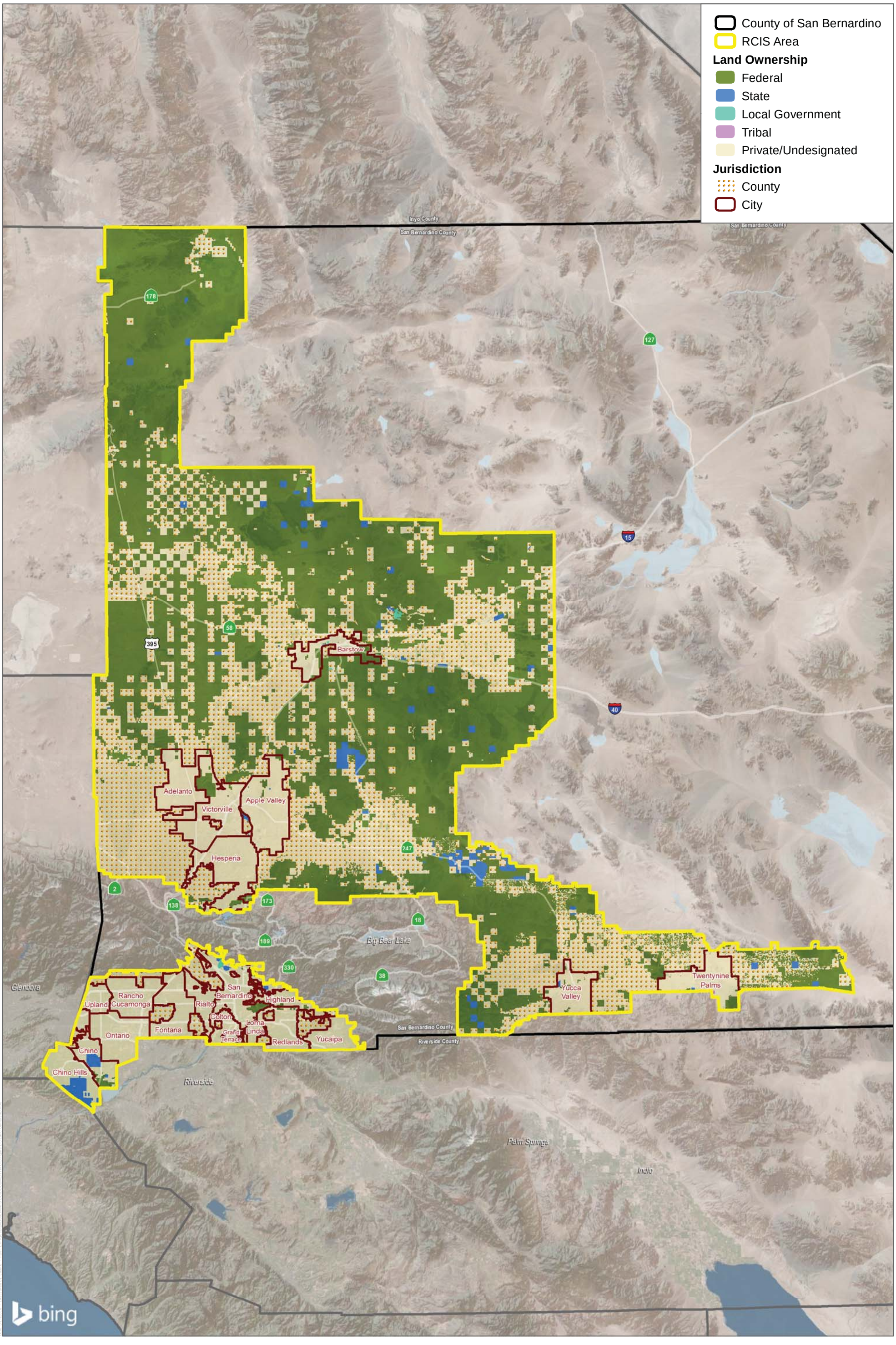

SOURCE: Bing Maps 2018; San Bernardino County 2018; BLM 2018

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FIGURE 2-5

Land Ownership and Jurisdiction

San Bernardino County RCIS

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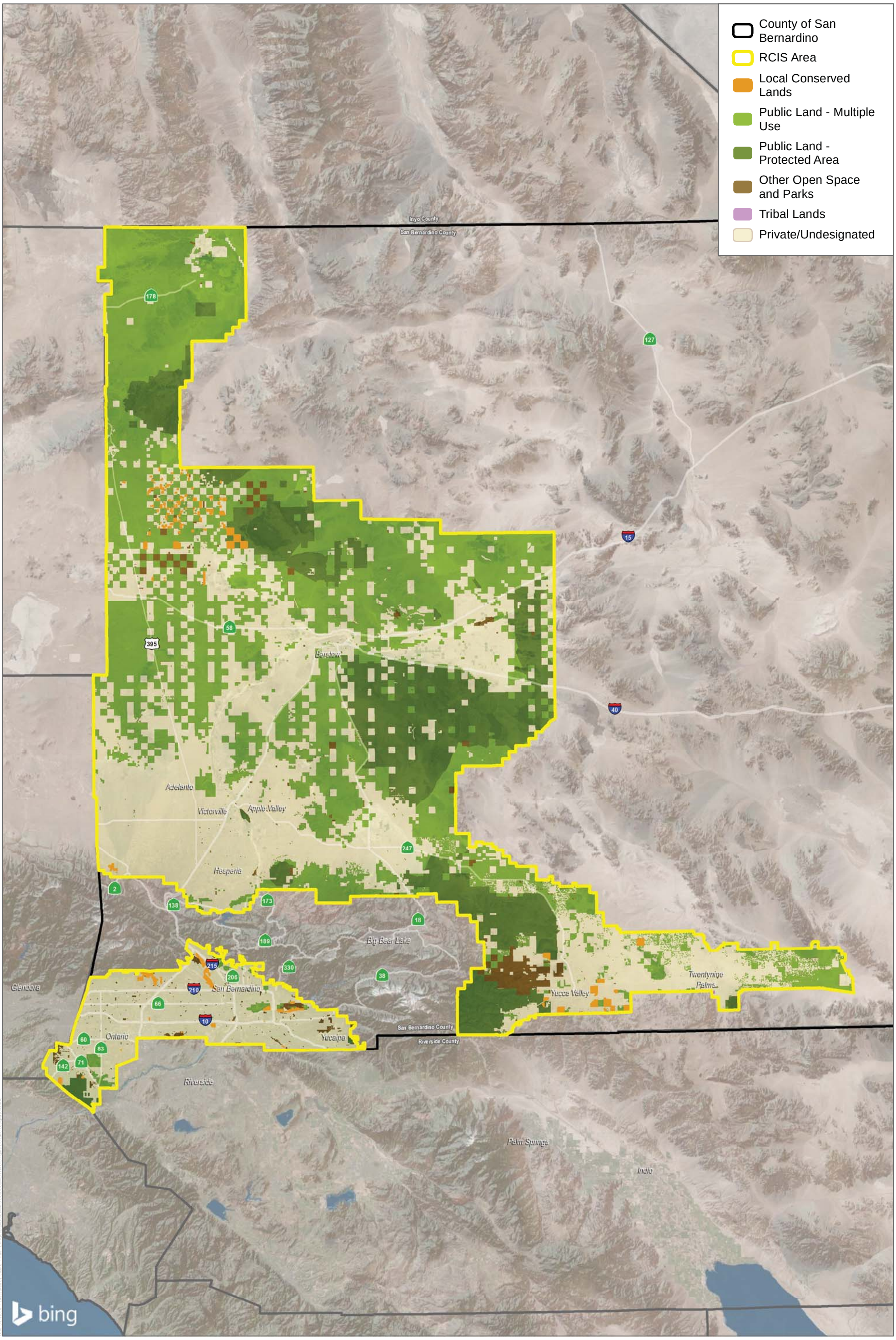

SOURCE: Bing Maps 2018; San Bernardino County 2018; BLM 2018

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FIGURE 2-6

Land Designations

San Bernardino County RCIS

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Table 2-2
Land Designations in San Bernardino County

Land Designation	RCIS Area		Elsewhere in San Bernardino County		Total
	Valley	*West Desert*	*Mountain*	*East Desert*	
Public Land - Protected Area	**8,146**	**530,078**	**71,644**	**5,599,577**	**6,209,445**
National Monuments, Parks, Preserves, and Refuges	--	51,802	67,450	3,599,106	3,718,358
BLM Wilderness and NCLs	--	473,184	712	1,992,312	2,466,208
CDFW Lands	--	5,003	119	2,079	7,201
California State Parks	8,146	89	3,362	6,080	17,677
Local Conserved Land	**4,870**	**13,414**	**819**	**13,257**	**32,361**
Public Land - Multiple Use	**8,393**	**1,120,956**	**386,560**	**817,953**	**2,333,862**
BLM ACECs		707,842	3	412,065	1,119,910
National Forests	1,059	17,394	386,372		404,824
Other BLM Lands	1,032	359,126	4	250,634	610,795
Other Federal Lands	--	--	--	5,833	5,833
Other State Lands	3,616	36,514	180	149,401	189,711
Other Local Government Lands	2,686	81	2	20	2,789
Other Open Space and Parks	**11,137**	**56,774**	**6,049**	**14,186**	**88,146**
Military	**2,358**	**231,004**	**360**	**2,016,792**	**2,250,515**
Tribal	**171**	**163**	**636**	**62,570**	**63,539**
Undesignated	**284,503**	**1,304,479**	**72,929**	**228,051**	**1,889,962**
Total	**319,578**	**3,256,867**	**538,998**	**8,752,385**	**12,867,828**

Notes: Land designation derived from the San Bernardino County Plan Base, which is a composite geographic information system (GIS) layer created for the San Bernardino Countywide Plan and used in the SBC RCIS to characterize and map land ownership, jurisdiction, and designations and is based on existing data from the County, SANBAG, BLM, State Parks, U.S. Protected Area Dataset (USPAD), California Protected Areas Dataset (CPAD) and Conservation Easement Database. Local Conserved Land is a composite GIS layer created for the San Bernardino Countywide Plan and used in the SBC RCIS to characterize, map, and track locally conserved lands in the County, including lands conserved by The Nature Conservancy, Wildlands, Mojave Desert Land Trust, Transition Habitats Conservancy, Inland Empire Resource Conservation District, Land Veritas, San Bernardino Department of Public Works, City of Fontana, City of Rancho Cucamonga, City of Colton, and the California Conservation Easement Database (CCED). The acreage summary provided here is approximate and intended to support landscape-scale assessment of land designation patterns in the County. Land designation data differs in quality, resolution, and accuracy from different sources; every effort was made to use data from authoritative sources.

A majority of San Bernardino County (84%) is outside the jurisdiction of local government (i.e., lands administered by the federal or state government). Of the 16% of lands under the jurisdiction of local governments, 12% unincorporated land within the land use jurisdiction of the County of San Bernardino and 4% is in incorporated cities. The Valley subarea of the RCIS Area is nearly all under local government jurisdiction; 85% of the Valley is in incorporated cities and approximately 14% is under the land use jurisdiction of the County of San Bernardino. Approximately 42% of the West Desert subarea of the RCIS Area is under local government jurisdiction; 34% is under the land use jurisdiction of the County of San Bernardino and 8% is in incorporated cities.

2.6 Other Resource Conservation and Management Plans and Programs

As described in Section 1.3, the intended use of the SBC RCIS is to provide a regional biological conservation guidebook to public agencies, the development community, environmental groups, other interested entities, and the public for science-based nonbinding and voluntary conservation and mitigation actions in the Valley and West Desert regions of San Bernardino County. The SBC RCIS was developed to be consistent with and to complement existing resource conservation and management plans and programs in the RCIS area. Figure 2-7 illustrates the key existing habitat conservation programs in and around the RCIS area. Table 2-3 provides a summary of the existing resource conservation and management planning and programs relevant to the SBC RCIS at the federal, state, and regional/local levels.

Table 2-3
Existing Resource Conservation and Management Planning and Programs Relevant to the SBC RCIS

Existing Plan/Program	Description
Federal Planning	
USFWS Recovery Plans for Federally-listed Species	Amphibians: California red-legged frog (USFWS 2002a); arroyo toad (USFWS 199) Reptiles: Agassiz's desert tortoise (Mojave population) (USFWS 2011) Birds: least Bell's vireo (USFWS 1998a); southwestern willow flycatcher (USFWS 2002b) Mammals: None Invertebrates: Delhi Sands flower-loving fly (USFWS 1997a) Fish: Santa Ana sucker (USFWS 2017b); Mohave tui chub (USFWS 1984) Plants: Gambel's water cress (USFWS 1998b); marsh sandwort (USFWS 1998b); Parish's daisy (USFWS 1997b)
USFWS-designated Critical Habitat for Federally-listed Species	Amphibians: California red-legged frog; arroyo toad Reptiles: Agassiz's desert tortoise (Mojave population) Birds: coastal California gnatcatcher; least Bell's vireo; southwestern willow flycatcher; western yellow-billed cuckoo; Mammals: San Bernardino kangaroo rat Invertebrates: None Fish: Santa Ana sucker Plants: Lane Mountain milkvetch; Parish's daisy
USFS Land and Resource Management Plans	Land Management Plan, Part 1: Southern California National Forest Vision (USDA Forest Service 2005a) and Land Management Plan, Part 2: San Bernardino National Forest Strategy (USDA Forest Service 2005b)
NPS General Management Plans	Joshua Tree National Park General Management Plan (USDOI National Park Service 1995)
BLM Resource Management Plans	Desert Renewable Energy Conservation Plan (DRECP) (BLM 2016a, b); West Mojave Resource Management Plan (BLM 2006); California Desert Conservation Area Plan (CDCA) as amended (BLM 1999); South Coast Resource Management Plan (BLM 1994);

Table 2-3
Existing Resource Conservation and Management Planning and Programs Relevant to the SBC RCIS

Existing Plan/Program	Description
DOD Integrated Natural Resource Management Planning	Marine Corps Air Ground Combat Center Twentynine Palms (UCR 1993); Fort Irwin National Training Center; Edwards Air Force Base (Edwards Air Force Base 2002); Naval Air Weapons Station China Lake (Tierra Data Systems 2014); Marine Corps Logistics Base Barstow (Vernadero Group 2017)
State Planning	
CDFW State Wildlife Action Plan	SBC RCIS occurs in the Desert Province and Southern California Province of the State Wildlife Action Plan (SWAP (CDFW 2015)
CEC California Desert Biological Conservation Framework	Interagency planning developed from Draft DRECP to set the foundation for further conservation planning in California deserts (CEC, CDFW, BLM, USFWS 2016)
Chino Hills State Park	1999 General Plan
Mojave Ecoregion RCA	California Strategic Growth Council Regional Conservation Assessment planning for the West Mojave.
Regional/Local Planning	
San Bernardino County	Existing General Plan; Countywide Plan in preparation
SANBAG Countywide Habitat Preservation/Conservation Framework Study	SANBAG Phase 1 Report (Dudek 2015), which was a foundational document prepared prior to the RCIS.
SCAG	Regional Comprehensive Plan (SCAG 2008)
Morongo Basin Conservation Priorities Report	Conservation Priorities Report prepared for the Morongo Basin portion of the West Desert subarea (Sonoran Institute and Morongo Basin Open Space Group 2012)
TNC Mojave Desert Ecoregional Assessment	Identifies areas important for continued survival of the Mojave Desert's biological diversity (Randall et al. 2010)
Draft Upper Santa Ana River HCP	In progress; Covers the Santa Ana River Watershed including all of Valley region and part of Mountain region; primarily addresses aquatic species/resources.
Wash Plan HCP	In progress; Upper Santa Ana River Wash area in a portion of the Valley region; incidental take of special status plant and animal species
Draft Apple Valley HCP/NCCP	In progress; Planning Agreement 2017, Independent Science Advisors Report 2016
Draft Antelope Valley RCIS	In progress; Includes portions of the Mojave Desert within Los Angeles County
North Fontana Interim MSHCP Policy	Allows the City to develop parcels in North Fontana under CEQA if no listed species occur on the property, and requires mitigation fees for impacts to Riversidean Alluvial Fan Sage Scrub or Riversidean Sage Scrub vegetation communities
Other Local HCPs	20 HCPs approved by the USFWS in San Bernardino County as of August 2014 (USFWS 2014; http://ecos.fws.gov/conserv_plans/). These approved HCPs were generally single project HCPs addressing single species issues. HCPs have been developed in the county to obtain take for Delhi Sands flower-loving fly (10 approved HCPs), San Bernardino kangaroo rat (6 approved HCPs), and desert tortoise (4 approved HCPs).
Planning by Municipalities	Individual general plans and land use policies and programs developed by cities and towns, including conservation and open space elements and overlays, steep slope and hillside ordinances, and other local resource protections.
Existing Mitigation and Conservation Banks	Cajon Creek Habitat Conservation Management Area, Soquel Canyon Mitigation Bank, Colton Dunes Conservation Bank, Lytle Creek Conservation Bank, Black Mountain Conservation Bank

Table 2-3
Existing Resource Conservation and Management Planning and Programs Relevant to the SBC RCIS

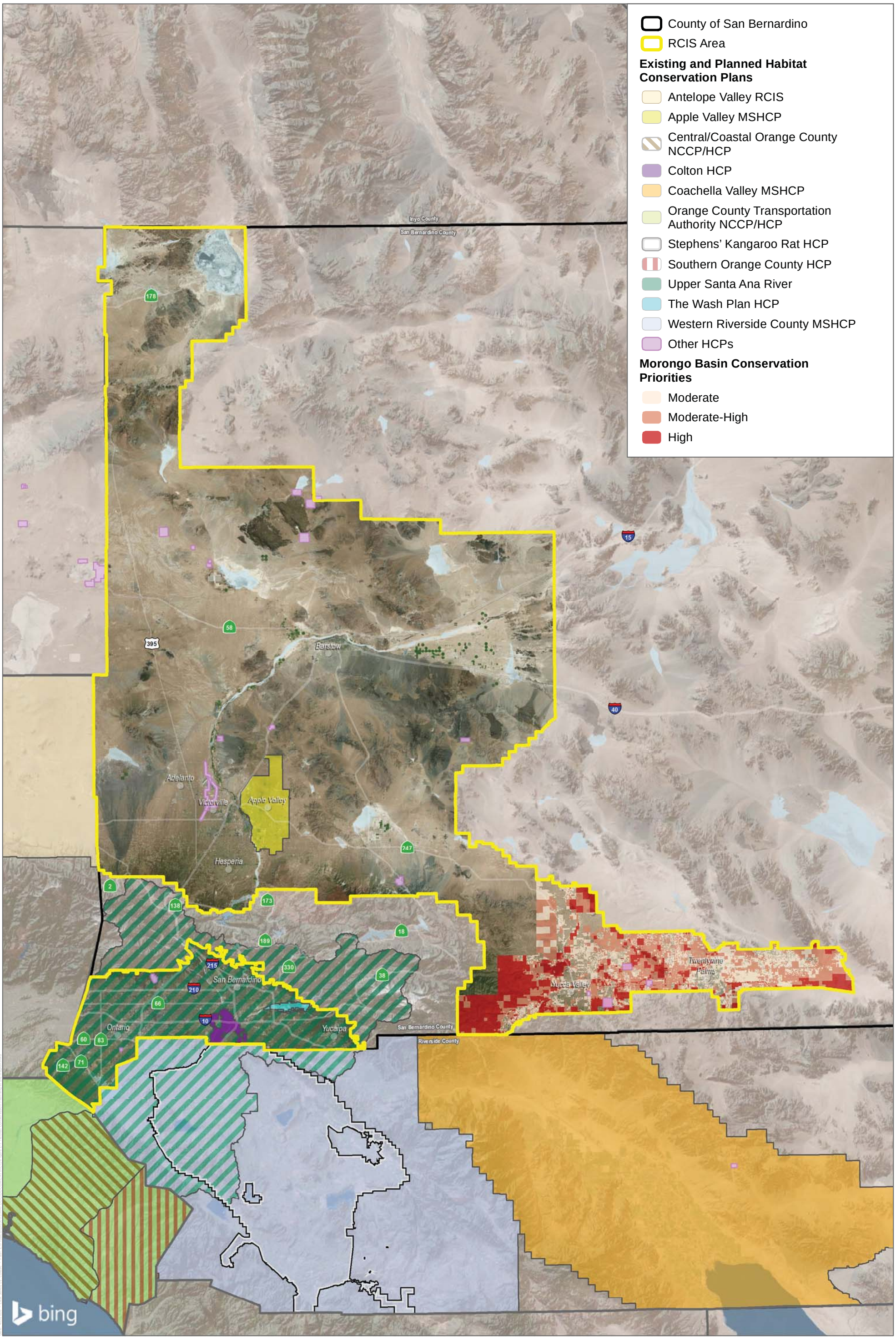
Existing Plan/Program	Description
Resource Conservation District Planning	Resource conservation planning and implementation conducted by Antelope Valley RCD, Inland Empire RCD, Riverside Corona RCD, Mojave Desert RCD
Santa Ana Watershed Project Authority (SAWPA)	Joint Powers Authority classified as a Special District that plan and implement resource management in the Santa Ana River Watershed; Member Agencies include Eastern Municipal Water District, Inland Empire Utilities Agency, Orange County Water District, San Bernardino Valley Municipal Water District, and the Western Municipal Water District
Flood Control District Planning	San Bernardino County Flood Control District; Santa Ana Watershed Stormwater Resource Plan
Land Trust Planning	Land acquisition, planning, and management conducted by Mojave Desert Land Trust; San Bernardino Mountains Land Trust, Transition Habitat Conservancy; Wildlife Heritage Foundation; Wilderness Land Trust; Riverside Land Conservancy

2.7 Land Uses and Reasonably Foreseeable Development

Consistent with CFGC 1852(c)(6), the SBC RCIS was developed in consideration of major water, transportation and transmission infrastructure facilities, urban development areas, and city, county, and city and county general plan designations that accounts for reasonably foreseeable development of major infrastructure facilities including renewable energy and housing. Figure 2-8 provides a compiled map of the community development, transportation, energy and other existing and reasonably foreseeable development in the RCIS area. Existing and reasonably foreseeable residential, commercial, and industrial development would be anticipated to be concentrated in the 22 incorporated towns and cities, their spheres of influence and within the community plan areas of the unincorporated County. Existing energy infrastructure occurs throughout the RCIS area, and new energy development is foreseeable in the region, particularly in the vicinity of existing generating facilities, substations, transmission lines. Existing transportation facilities exist throughout the RCIS area; reasonably foreseeable transportation development projects in the RCIS area include planned Federal Transportation Improvement Program projects and the proposed Caltrans High Desert Corridor. Other reasonably foreseeable development in the RCIS area includes water infrastructure and mining development.

2.8 Regional Pressures and Stressors

The 2015 *California State Wildlife Action Plan* states a standardized set of anthropogenic stressors and pressures on the biological resource conservation elements (CDFW 2015). The most prevalent pressures and stressors within the RCIS area are discussed below.



SOURCE: Bing Maps 2018; County of Orange 2018; San Bernardino County 2018

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FIGURE 2-7

Habitat Conservation Planning in the Region

San Bernardino County RCIS

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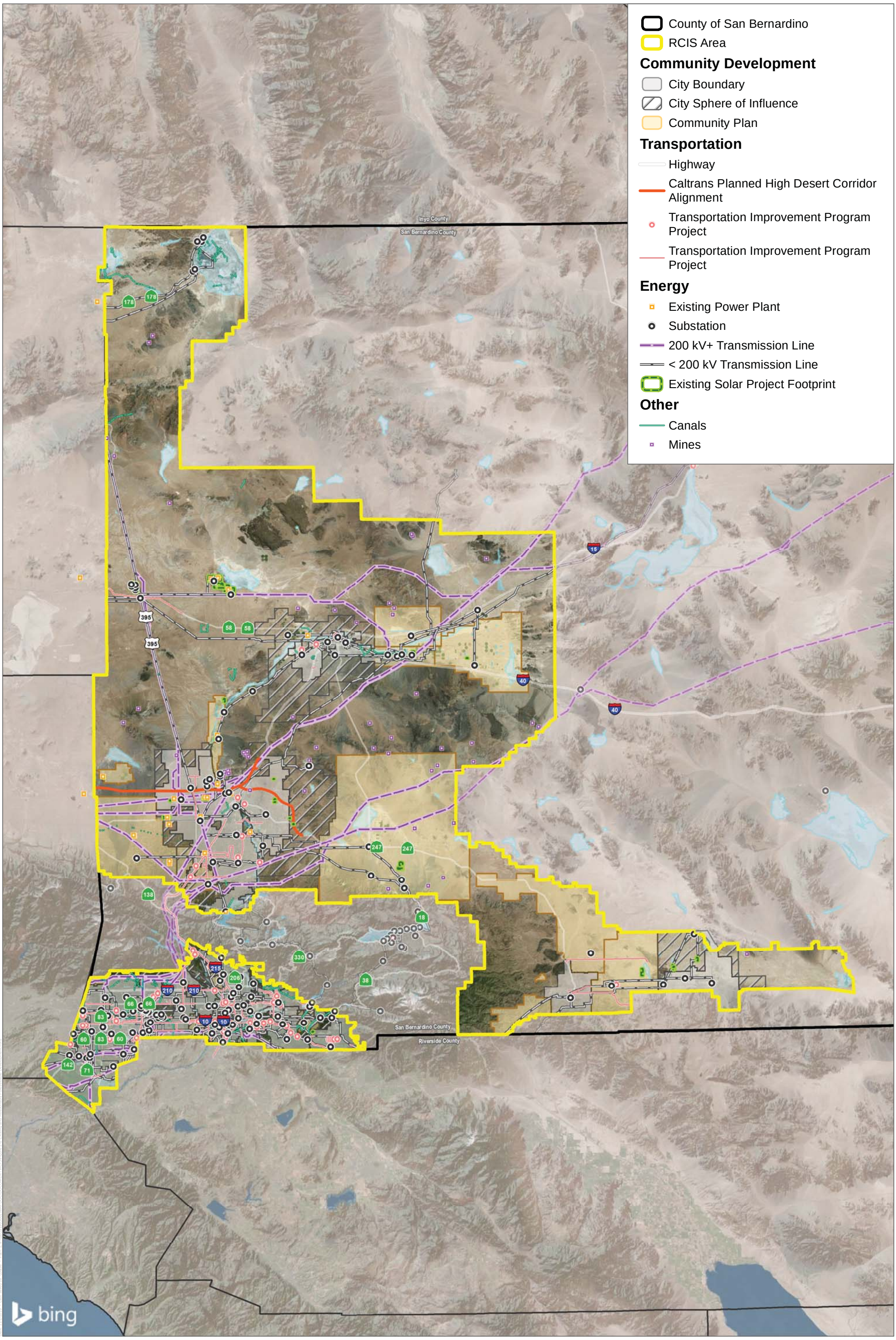

SOURCE: Bing Maps 2018; San Bernardino County 2018; CEC 2018

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FIGURE 2-8

Existing and Reasonably Foreseeable Development

San Bernardino County RCIS

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Urban and Rural Development

San Bernardino County has exhibited a growth rate of 25.1 percent between the years 2000 and 2016 (SCAG 2017) and the region is one of the fastest growing region of the United States (County of San Bernardino 2005). Urban, rural, and agricultural development can result in direct habitat loss, degradation of adjacent habitat, fragmentation, and the overall decrease in habitat quality of residual natural lands (SWAP 2015, Randall et al. 2010). Beyond the direct stressor of loss of natural lands to development, indirect effects of development could include increased human access to natural lands, further presence of non-native plant and wildlife species into adjacent natural lands, and increased light pollution (SWAP 2015, Webb et al. 2009).

Transportation Corridors and Roadways

The urban and suburban metropolitan areas and urban/agricultural areas with the RCIS area are linked by highways, utility corridors, and railroads, which facilitate secondary roads and other vehicular routes to serve as these linkages. Major transportation corridors in the Mojave Desert/West Desert subarea include Interstate 15 (I-15) running from southwest to northeast; Interstate 40 (I-40), Highway 58, and Highway 247 running east/west; and Highway 395 and Highway 127 running north/south. In the Valley subarea of the RCIS area, Interstate 10 (I-10), State Route 210, and State Route 60 are the major transportation corridors running east/west. Running north/south is Interstate 215 (I-215), continuation of I-15, and State Route 18 which extends into the mountain ecoregion. Roads and highways create fragmented habitats and can restrict wildlife movement, lead to direct mortality due to collisions, and lead to direct habitat loss (SWAP 2015).

Water Conveyance

Across California, water needs associated with development and agriculture lead to the management and altering of the states limited water resources (SWAP 2015). Water management includes groundwater withdrawals, irrigation systems, water diversion through dams, canals, and aqueducts, and channelization associated with stormwater infrastructure (SWAP 2015). Water diversion, stormwater conveyances, and groundwater extraction can alter naturally occurring hydrologic processes that could: reduce abundance of non-native riparian species; reduce the diversity and abundance of riparian-dependent wildlife; alter sediment deposition patterns; alter naturally occurring water filtration; increase soil salinity; increase the risk of flooding and erosion; increase frequency and magnitude of wildfire; and reduce the forage availability and water access for wildlife and livestock (CDFW 2015, Dudley 2009). Wetland, riparian, and aquatic habitats are known to support a high number of special status species and overall rich and diverse biological communities (CDFW 2015).

Utilities and Other Infrastructure

As the demand for accessible and reliable utilities continues to grow, additional development of energy generation facilities and associated infrastructure have the potential to cause further habitat fragmentation, disturbance, and habitat loss (CDFW 2015). California has responded to the need to reduce greenhouse gas emissions and in turn plans to increase development of renewable sources such as wind, solar, hydroelectric, biomass, and geothermal (CDFW 2015). Most existing and sited utility-scale renewable energy farms are located in undeveloped lands primarily in the desert region of California, and require further development of access roads and transmission infrastructure increasing the risk of damage to natural lands (CDFW 2015). Energy generation facilities and associated infrastructure can further cause dust and dust suppression use (e.g., chemical suppressants), noise, light pollution, altered microclimates, topography, and drainage, pollution and hazardous materials, water consumption, soil disruption, increased fire risk, increased public access, direct wildlife collision, and increased predation on sensitive species (76 FR 62214–62258; BLM and DOE 2010; CDFW 2015; Cryan 2011; Hunt et al. 1998; Lovich and Ennen 2011; Randall et al. 2010; Webb et al. 2009).

Grazing

California Farmland Mapping and Monitoring Program data shows that a majority of undeveloped land within San Bernardino County is suitable for livestock grazing (California Department of Conservation 2016). In the Mojave Desert, livestock grazing occurs both on privately owned land and on several large livestock allotments located on BLM and USFS lands (Randall et al. 2010). Grazing can cause decreases in water quality, streambank erosion, modified channel morphology, disturbance to riparian vegetation and wildlife, soil disturbance and upland erosion, upland and riparian vegetation trampling, and reduction of native vegetative cover (Belsky et al. 1999; Randall et al. 2010; Webb et al. 2009). However, thoughtfully managed grazing can be beneficial as a conservation tool, and collaboration between land managers and ranchers can lead to successful mutualistic relationship between human use and the preservation/conservation of habitat (CDFW 2015).

Mining

Mining in a key factor in the San Bernardino County economy (San Bernardino County 2016) with active mines in valley, mountain, and desert regions. Resources that have been or are currently being extracted include borates, tungsten, talc, copper, zinc, coal, calcite, lead, strontium, uranium, precious metals (e.g., gold and silver), gem-quality non-metals, and building materials (e.g., sand, gypsum, decorative rock, cinders, and gravel) (Randall et al. 2010). Mining can cause surface disturbance, which can lead to damage of soils and biological crusts; this in turn can increase erosion which could alter both air and water quality (Randall et al. 2010). Of the various forms of mining, open

pit and strip mining have been shown to be the most detrimental to nearby habitats (Randall et al. 2010). With mining also come access roads, which can result in further disturbances such as fragmentation and invasive species encroachment (Randall et al. 2010). Further, mining operations often require large amounts of water for function, and gravel and sand mining in particular can alter natural hydrology patterns since these forms of mining occur in alluvial fans, mountain foothills, and desert washes (Randall et al. 2010).

Military Uses

Military lands cover approximately 233,400 acres of the RCIS area, with the majority occurring within the Desert region. The Desert region supports several military installations and training areas, including Naval Air Weapons Station China Lake, National Training Center Fort Irwin, Edwards Air Force Base, Marine Corps Logistics Base Barstow, and Marine Corps Air Ground Combat Center Twentynine Palms (OPR 2006). Military training and testing activities include ground troop activities, tracked vehicle maneuvers, bombing strikes, and other various weapons testing and training (CDFW 2015). In some areas, disturbance caused by military maneuvers conducted almost 70 years ago is still visible in the form of soil erosion, surface scarring, and vegetation removal (Pavlik 2008). Relocation of desert tortoise associated with the expansion of Fort Irwin resulted in high desert tortoise mortality and a decrease in tortoise population numbers as compared to adjacent monitoring areas (Pavlik 2008; Randall et al. 2010). Conversely, military installations provide indirect benefits to conservation goals by restricting public access and providing a buffer against encroaching developments (Randall et al. 2010).

Recreational Uses

The varied landscapes of San Bernardino County are used for a wide variety of recreational uses, including hiking, biking, camping, fishing, hunting, winter sports, off-highway vehicles (OHVs), and rockhounding. Recreational uses have the potential to cause disturbance within the natural lands on which they occur (CDFW 2015). Potential impacts include soil disturbance, contamination of waterways and habitat due to anthropogenic waste, and disruption of wildlife foraging and breeding due to human presence (CDFW 2015). OHV use can cause significant surface disruption (Webb et al. 2009; Randall et al. 2010), which in turn can lead to greater wind and water erosion as well as facilitate the invasion of non-native plant species. OHV use can also alter hydrology and water runoff patterns, disrupt wildlife activities, and contribute to habitat loss and fragmentation (Brooks and Lair 2009; Randall et al. 2010).

Non-Native Species

Non-native plant species occur throughout all of vegetation communities in San Bernardino County, and anthropogenic activities can spread and promote the invasion of these exotic,

invasive species that often outcompete native plant species. Similarly, non-native animal species can degrade species habitat and disrupt ecological systems through predation, out-competing natives for resources, spreading diseases, and even changing the natural processes of the land (SWAP 2015). Further, it is anticipated that invasion by non-native species, especially grasses, will be compounded with climate change (Sandel and Dengermond 2011).

Climate Change

Climate change is affecting ecosystems in California and should be considered in conservation and management decisions that influence the state's natural resources (CDFW 2015). Effects on natural lands stemming from climate change include "…changes in the duration, frequency, or severity of extreme events, such as wildfire, storms, floods, and extreme temperatures" (CDFW 2015). Species and sensitive habitats that have restricted adaptive capacity to these rather rapid changes are more vulnerable to the adverse effects associated with climate change. Climate change extremes compound the pressures and stressors discussed previously and make previous observed outcomes more uncertain in the future (CDFW 2015).

3 CONSERVATION STRATEGY

The conservation strategy contains the central components of the SBC RCIS and was developed consistent CDFW guidelines and CFGC 1852(c). The conservation strategy includes a description of the conservation elements (Section 3.1), which are the landscape processes and features, vegetation communities, and Focal Species for which the strategy was developed. The Conservation Analysis in Section 3.2 evaluates the level of existing protection and conservation gaps for the conservation elements in the Valley and West Desert subareas, and this analysis was used to inform development of the conservation goals and objectives provided in Section 3.3. Section 3.4 identifies and describes the conservation actions and priorities of the SBC RCIS for the Valley and West Desert subareas. The implementation framework for the SBC RCIS conservation strategy is provided in Section 4. The following provides a summary of the approach to developing the SBC RCIS conservation strategy.

Approach to Developing the Conservation Strategy

The overall intent of the SBC RCIS conservation strategy is to establish a framework that structures information on conservation priorities to support implementation of coordinated conservation and mitigation actions across the Valley and West Deserts areas of the San Bernardino County. The SBC RCIS conservation strategy is intended to be consistent with, and in fact complement and leverage, the wide array of existing resource conservation and management programs, planning, and designations in federal, state, and local jurisdictions of the RCIS area (see Section 2.5). As a voluntary and non-binding document decoupled from regulatory permitting processes (see Section 1.3), the SBC RCIS conservation strategy is intended to provide direction on conservation priorities and actions that may be implemented by entities seeking to make conservation investments or fulfill mitigation obligations.

The SBC RCIS conservation strategy was developed following a systematic process (Margules and Pressey 2000) of compiling biodiversity information for planning area, identifying conservation targets, reviewing existing conservation areas, and selecting conservation actions and priorities. To develop a conservation strategy of this nature for a planning area of this size and complexity, the conservation strategy development followed an organize, synthesize, and convey approach.

- ***Organize:*** Beginning in 2014 with the initiation of the Phase 1 Framework Study, a reference library of plans, studies, research papers, and mapping was compiled, maintained, and used to develop the conservation strategy. A GIS geodatabase for the project was also developed to house all digital mapping data for the SBC RCIS. This information and data was assembled from County, SBCOG, SCAG, local municipalities, local districts, CDFW, USFWS, other resource agencies, researchers, and other public

sources. Information and data used to describe the landscape context and setting are cited in Section 2. Information and data used to describe the landscape processes and features, vegetation communities, and Focal Species are cited in Section 3.1. Hundreds of plans, studies, papers, and data layers have been organized to support the SBC RCIS.

- ***Synthesize:*** Integrating and deriving meaning from the vast amounts of information available for the RCIS was a key step in developing the SBC RCIS conservation strategy. The Plan Base and Local Conserved Land layers are composite GIS coverages used to synthesize and describe land ownership, designations, jurisdictions, and protected status across the RCIS area. Key information about the conservation elements has been synthesized in the description of these resources in Section 3.1 and the species summaries in Appendix A. Key data layer descriptions are provided in Appendix B. A synthesis of existing conservation and conservation gaps is provided in Section 3.2, and conservation objectives for the conservation elements, which synthesize information into priority areas for conservation, are provided in Section 3.3.
- ***Convey:*** Expressing the conservation strategy in a consumable way that is easily understood can streamline implementation of conservation and mitigation actions. Section 3.4 provides the conservation "toolbox" of conservation actions in the Valley and West Desert subareas and prioritization factors for optimizing conservation outcomes. A framework for how these actions and priorities would be implemented is outlined in Section 4.

3.1 Conservation Elements

The following sections describe the conservation elements of the RCIS for the Valley subarea and the West Desert subarea. Conservation elements are defined as "an element with ecological functions within an RCIS, including focal species and their habitats, wildlife corridors and linkages, and other natural resources" (CDFW 2017). For the purposes of the SBC RCIS, the conservation elements are organized into Landscape Processes and Features, Vegetation Communities, and Focal Species.

3.1.1 Valley Subarea

For the primary purpose of organizing and conveying conservation element information in the SBC RCIS conservation strategy, habitat groups were established. Habitat groups are logical assemblages of conservation elements that are addressed by the conservation strategy. Habitat groups provide a straightforward way of aggregating information on vegetation communities, Focal Species, and the associated landscape processes throughout the SBC RCIS (Table 3-1).

The Focal Species for the Valley subarea were selected based on the approach described in Section 3.1.1.3 including to include those species that "best represent the remaining important habitat areas of the Valley". Therefore, the Focal Species assigned to each habitat group are intended to be representative of those habitats, and a Focal Species may be representative of more than one habitat group. Spatially, the habitat groups can be mapped based on the mapping of the vegetation communities that comprise each group; however, the mapping of each habitat group was not used to map the distribution of the Focal Species. As described in Section 3.1.1.3, Focal Species-species habitat areas have been developed for each species to map their potential distribution.

Table 3-1
Habitat Groups for the Focal Species in the Valley Subarea

Habitat Group	General Vegetation Communities	Focal Species	
Grassland	Native Grasslands Non-native Grasslands	Blainville's horned lizard burrowing owl white-tailed kite	Delhi Sands flower-loving fly western spadefoot mountain Lion
Riparian and Wetland	Riparian Wetlands and Waters	Western pond turtle Least Bell's vireo southwestern willow flycatcher tricolored blackbird white-tailed kite yellow-billed cuckoo Arroyo chub	Santa Ana Sucker California red-legged frog Santa Ana speckled dace mountain lion Gambel's watercress Marsh Sandwort San Bernardino aster
Riversidean Alluvial Fan Sage Scrub	Riversidean Alluvial Fan Sage Scrub	San Diego ringneck snake Blainville's horned lizard Western spadefoot Bell's sparrow burrowing owl coastal California gnatcatcher	San Bernardino kangaroo rat Los Angeles pocket mouse mountain lion Santa Ana River woollystar slender-horned spineflower
Transitional Scrub, Chaparral, and Woodland	Chaparral Coastal Scrub Forest and Woodlands Juniper Woodlands	Blainville's horned lizard Bell's sparrow burrowing owl coastal California gnatcatcher	white-tailed kite western spadefoot mountain lion
Developed and Agriculture	Agriculture Barren Developed and Disturbed Areas Eucalyptus Naturalized Forest	burrowing owl tricolored blackbird	mountain lion

Notes: Individual Focal Species may be members of more than one habitat group.

3.1.1.1 Landscape Processes and Features

Key landscape processes and features in the Valley subarea that maintain habitat areas for Focal Species are described below.

Hydrological Processes and Features

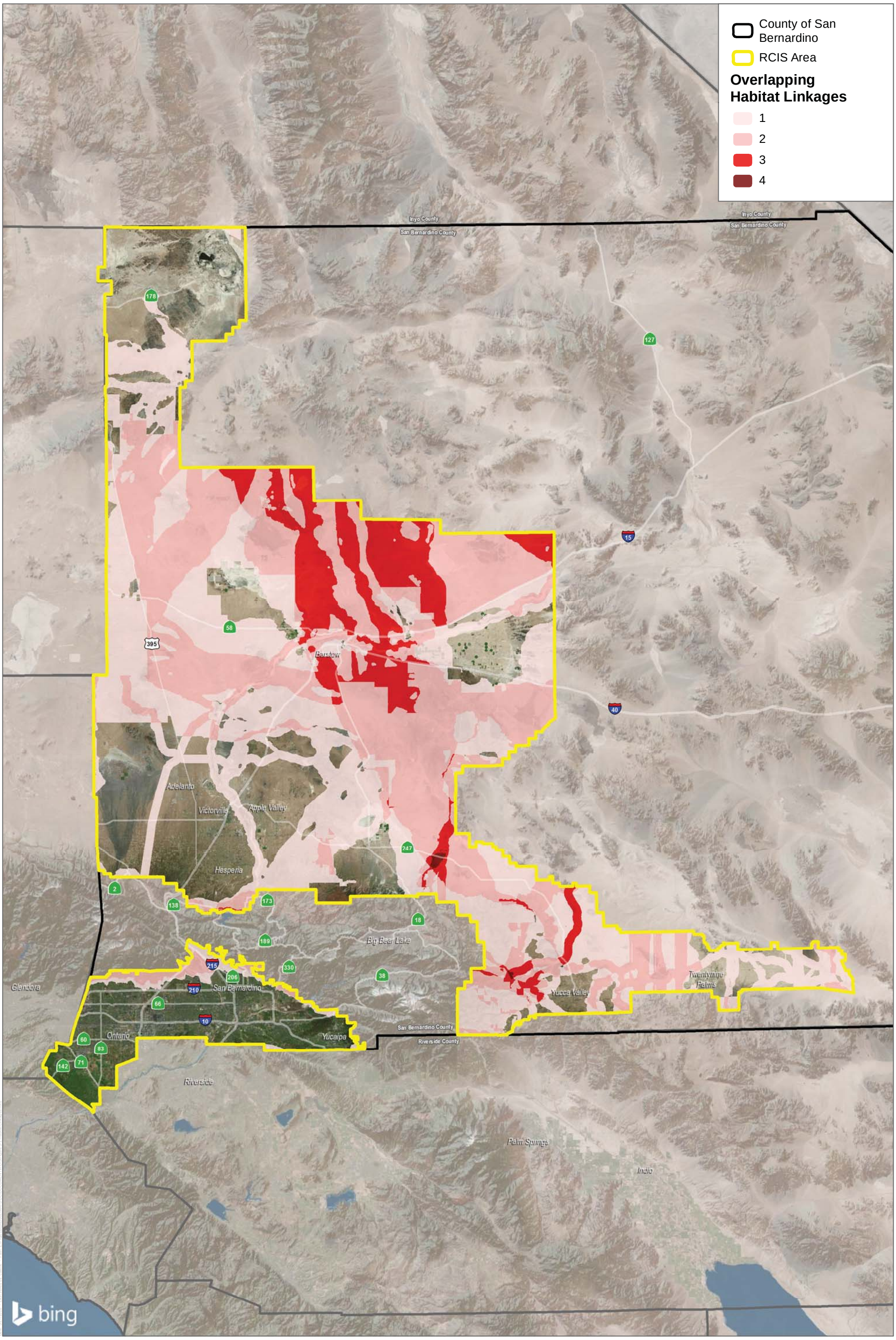
The riparian and wetland and the Riversidean alluvial fan sage scrub habitat groups are supported by hydrological features that maintain the aquatic and terrestrial habitat quality for Focal Species. Section 2.4 provides the hydrology context and setting, including a discussion of important rivers and creeks, alluvial fan areas and terraces, and flood channel and reservoirs supported these processes.

Habitat Connectivity and Wildlife Movement

A well-accepted principle of conservation biology is that interconnected blocks of habitat are better than isolated habitat blocks. Terrestrial wildlife species typically occupy habitat patches most favorable for them within a landscape matrix, and they may move between favorable habitat patches through less favorable areas. These wildlife movement areas between larger habitat patches are generally referred to as habitat linkages or movement corridors. Movement ecology is particularly species- and scale-specific and often include short-term individual movements, such as foraging within an organism's home range; long-term dispersal, or one-time emigration and immigration events between disparate populations; and seasonal or periodic migration. Corridors and habitat linkages can allow for long- or short-term movements, dispersal, and migration depending on the life history requirements and ability of a particular species to travel through a landscape. Locations that serve as corridors or habitat linkages for some species may serve as core habitat for other species.

In the Valley subarea, the riparian and wetland habitats typically associated with rivers, creeks and other drainages form linkages that provide important habitat connectivity and wildlife movement functions. Additionally, regional habitat connectivity modeling has been conducted that provide insights into least cost pathways for the movement of terrestrial wildlife between core areas. Figure 3-1 depicts a composite habitat linkage layer developed from the multiple regional habitat connectivity modeling efforts[4] done in San Bernardino County.

[4] California Essential Habitat Connectivity Project (Spencer et al. 2010), South Coast Wildlands Desert Linkage Network (Penrod et al. 20112), South Coast Wildlands Joshua Tree Twenty Nine Palms Wildlife Corridors (Penrod et al. 2008), South Coast Wildlands Missing Linkages Wildlife Corridors (Beier et al. 2006), Desert Tortoise Conservation Areas and Linkages (Averill-Murray et al. 2013), and Conservation Biology Institute (CBI) West Mojave ecoregion connectivity modeling for Large and Small species (CBI 2017).



SOURCE: Bing Maps 2018; San Bernardino County 2018; CBI 2018

DUDEK

0 12.5 25 Miles

FIGURE 3-1

Habitat Linkages

San Bernardino County RCIS

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The foothills of the Valley subarea are identified as important for wildlife movement based on these habitat connectivity models. Although not included as a habitat linkage on Figure 3-1, the Santa Ana River and its tributaries are known to provide wildlife movement corridors.

Other Important Landscape Features

Other important landscape features were identified during the identification of conservation elements for the Valley, including:

- San Bernardino Mountain foothills: These areas of the Valley support important habitat for Focal Species, provide important connectivity to the adjacent Mountain region, and occur on an elevational gradient that can provide climate refugia and allow for species adaptation to changing climate conditions.
- Working lands: Working lands generally refers to land uses associated with farming or ranching that typically includes a mixture of agricultural habitats, riparian/wetland habitats and/or grasslands that can be important for Focal Species. Important working lands in the Valley are located in the Prado Basin and east valley areas like Redlands, Mentone, and Yucaipa.
- Delhi Sands formations: Remaining, irreplaceable habitat areas for the Delhi Sands flower-loving fly.
- Chino Hills, Jurupa Hills, and Crafton Hills: These areas provide Focal Species habitat, habitat connectivity, and elevational gradients that can allow for species adaptation to changing climate conditions.

3.1.1.2 Vegetation Communities

Vegetation communities are described by a classification scheme based on the plant species growing together with characteristically uniform structures and habitats, consistent species compositions, and recurrence across the landscape (Jennings et al. 2009). A hierarchical, seamless National Vegetation Classification Standard (NVCS)-based vegetation community dataset was developed for San Bernardino County from multiple sources[5] that was used for the SBC RCIS. In the Valley subarea, existing mapping data was adapted to the NVCS system. In the West Desert subarea, the CDFW and AIS mapping was originally developed in the NVCS system. Vegetation communities are described at two levels: at the general Vegetation Community level and the mid-level Vegetation Type level. As described above in Section 3.1.1,

[5] CDFW Alliance-level mapping of the DRECP (AIS 2013; VegCAMP et al. 2013), Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) (USDA Forest Service 2014), and SANBAG existing land-use layer (SANBAG 2012).

these vegetation communities may be aggregated into habitat groups. Fine-scale alliance level vegetation information was not available for the entire SBC RCIS; however, alliance-level information was used in the development of the SBC RCIS where it was available. Vegetation communities that potential contain sensitive alliances[6] are noted in the discussion below. Table 3-2 provides a summary of the general vegetation communities and mid-level vegetation types by habitat group for the Valley subarea. Figure 3-2 shows the habitat groups and general vegetation communities in the RCIS area.

Table 3-2
Vegetation Communities and Land Covers in the Valley Subarea

HABITAT GROUP General Vegetation Community Mid-Level Vegetation Type	Acreage
GRASSLAND	
Native Grasslands	**564**
Alkaline Mixed Grasses	564
Non-Native Grassland	**36,773**
Annual Grasses and Forbs	36,413
Developed and Disturbed Areas	19
Non-Native/Invasive Grass	170
Perennial Grasses and Forbs	172
RIPARIAN AND WETLAND	
Riparian	**1,367**
Baccharis (Riparian)	75
California Sycamore	87
Fan Palm	2
Fremont Cottonwood	29
Riparian Mixed Hardwood	364
Riparian Mixed Shrub	11
Willow	659
Willow (Shrub)	140
Wetlands and Waters	**1,511**
Agriculture Pond or Water Feature	137
Intermittent Lake or Pond	44
Intermittent Stream Channel	120
Perennial Lake or Pond	46

[6] Alliances are given a rarity ranking standardized by Natural Heritage methodology based on a one to five scale, ranging from critically imperiled (1) to demonstrably secure (5). Alliances with a state ranking of S1 through S3 were considered sensitive.

Table 3-2
Vegetation Communities and Land Covers in the Valley Subarea

HABITAT GROUP General Vegetation Community Mid-Level Vegetation Type	Acreage
Reservoir	2
River/Stream/Canal	229
Tule - Cattail	10
Urban or Industrial Impoundment	115
Water (General)	674
Waterway	41
Wet Meadows	94
RIVERSIDEAN ALLUVIAL FAN SAGE SCRUB	
Riversidean Alluvial Fan Sage Scrub	**18,840**
Riversidean Alluvial Scrub	14,284
Scalebroom	4,556
TRANSITIONAL SCRUB, CHAPARRAL, WOODLAND	
Chaparral	**16,368**
Ceanothus Mixed Chaparral	3,166
Chamise	2,946
Lower Montane Mixed Chaparral	5,698
Scrub Oak	1,602
Soft Scrub Mixed Chaparral	1,433
Sumac Shrub	1,523
Coastal Scrub	**17,065**
Buckwheat	7,036
California Sagebrush	8,293
Coastal Cactus	93
Encelia Scrub	1,643
Forest and Woodlands	**2,570**
Bigcone Douglas-Fir	17
California Walnut	284
Canyon Live Oak	315
Coast Live Oak	1,664
Coastal Mixed Hardwood	231
Coulter Pine	15
Interior Mixed Hardwood	37
Knobcone Pine	6
Juniper Woodlands	**72**
California Juniper (shrub)	72

Table 3-2
Vegetation Communities and Land Covers in the Valley Subarea

HABITAT GROUP General Vegetation Community Mid-Level Vegetation Type	Acreage
DEVELOPED AND AGRICULTURE	
Agriculture	21,256
Barren	461
Developed and Disturbed Areas	202,540
Eucalyptus Naturalized Forest	190
Valley Subarea Total	319,578

Grassland

Grasslands occur over 12% of the Valley subarea. It is the predominant vegetation type in the southwestern portion of the subarea and grasslands are also scattered throughout the subarea. Non-native grasslands are substantially more common than native grasslands. Native grasslands occur centrally in small areas from College Heights south to Archibald Ranch and east to Fontana. Possible sensitive grassland alliances that could occur in the subarea include: *Bromus carinatus – Elymus glaucus, Centromadia (pungens), Danthonia californica, Deinandra fasciculate, Elymus glaucus* Montane, *Festuca idahoensis, Festuca rubra, Glyceria (elata, striata), Heterotheca (oregona, sessiliflora), Hordeum brachyantherum, Mimulus (guttatus), Muhlenbergia rigens, Poa secunda, Selaginella bigelovii, Sporobolus airoides, Trifolium variegatum.*

Riparian and Wetland

Riparian and wetland areas only occur over 1% of the Valley subarea. They generally occur along linear hydrologic features, including channelized areas. There are several small features along the northeastern boundary of the subarea and longer features south of San Bernardino. Channelized features dominate the area east of Ontario. The largest areas of riparian and wetland vegetation is associated with Chino and Mill creeks between the cities of Chino and Norco.

County of San Bernardino
RCIS Area

Habitat Group and General Vegetation Communities

Desert Scrub
- Alkali Scrub
- Barren
- Sonoran and Mojavean Desert Scrub

Dune and Playa
- Desert Dunes
- Playa

Grassland
- Native Grasslands
- Non-Native Grassland

Riparian and Wetland
- Riparian
- Riparian and Desert Wash
- Wetlands and Waters

Riversidean Alluvial Fan Sage Scrub
- Riversidean Alluvial Fan Sage Scrub

Transitional Scrub
- Alpine Scrub
- Chaparral
- Coastal Scrub
- Forest and Woodlands
- Great Basin Scrub
- Joshua Tree Woodland
- Juniper Woodlands

Developed and Agriculture
- Agriculture
- Barren
- Developed and Disturbed Areas
- Eucalyptus Naturalized Forest

Inyo County
San Bernardino County
San Bernardino County
Riverside County
Barstow
Adelanto
Victorville
Apple Valley
Hesperia
Big Bear Lake
Yucca Valley
Twentynine Palms
San Bernardino
Yucaipa
Ontario
Glendora
Riverside
Palm Springs
Indio
178
58
395
40
247
2
138
173
18
189
330
38
215
206
210
66
10
60
83
71
142

SOURCE: Bing Maps 2018; San Bernardino County 2018; USDA 2018; CDFG 2017

DUDEK

0 12.5 25 Miles

FIGURE 3-2

Habitat Groups and Vegetation Communities

San Bernardino County RCIS

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Riparian communities occur along the northeastern edge of the subarea from the San Bernardino National Forest south to City Creek. Wetlands and Waters include unvegetated and artificial areas, as well as native vegetation, such as tule – cattail and wet meadows. As a group wetlands and waters occur in linear areas, generally between San Bernardino south to the southern boundary of the subarea and west to SR-71. Tule – cattail occurs in the largest area in the northwestern portion of the subarea. Wet meadows occurs in the largest area along Chino Creek.

Possible sensitive riparian alliances include *Platanus racemosa* within California Sycamore, *Washingtonia filifera* within Fan Palm, and *Populus fremontii* within Fremont Cottonwood. Willow sensitive alliances that could occur in the subarea include *Salix laevigata* and *Salix gooddingii*; sensitive alliances dominated by shrub willows that would be possible include *Salix lemmonii* and *Salix lutea*.

For sensitive wetland communiites, three possible sensitive wetland alliances could occur within Tule – Cattail: *Schoenoplectus americanus*, *Bolboschoenus maritimus*, and *Scirpus microcarpus*. Wet meadows could constitute the following sensitive alliances: *Carex (aquatilis, lenticularis)*, *Carex barbarae*, *Carex densa*, *Carex douglasii*, *Carex echinata*, *Carex heteroneura*, *Carex integra*, *Carex jonesii*, *Carex luzulina*, *Carex microptera*, *Carex serratodens*, *Eleocharis acicularis*, *Juncus nevadensis*, and *Juncus (oxymeris, xiphioides)*.

Riversidean Alluvial Fan Sage Scrub

Riversidean alluvial fan sage scrub covers 6% of the Valley subarea. It generally occurs in the alluvial fans that come out of the foothills of the San Bernardino Mountains in the northern portion of the subarea. There is also an extensive area in the northeastern portion of the subarea that runs along the Santa Ana River through the subarea to the southwest. Scalebroom tends to occur more centrally along the watercourse of the alluvial fan, while the Riversidean alluvial scrub occurs more broadly within the floodplain.

Riversidean alluvial fan sage scrub is considered "locally sensitive" due to the rare plants and small mammals that it supports, including the state- and federally-listed slender-horned spineflower (*Dodecahema leptoceras*) and Santa Ana woolly star (*Eriastrum densifolium* ssp. *sanctorum*) (Barbour and Wirka 1997).

Transitional Scrub, Chaparral, and Woodland

Approximately 11% of the Valley subarea is transitional scrub, chaparral, and woodland. This habitat group occurs predominantly along the entire length of the northern and northeastern edges of the subarea and along portions of the southern boundary from Southridge east to I-10. It also occurs in the southwestern portion of the subarea in and around Chino Hills State Park.

The chaparral communities occur along the northern and northeastern subarea boundaries and along the southwestern edge of the subarea generally north of Telegraph Canyon Road. Coastal scrub is scattered in small stands along the northern boundary of the subarea and less common than chaparral, but still consistent along the northeastern boundary. It also occurs in along the southern boundary from Northridge east to the I-10. Coastal scrub also occurs in Chino Hills State Park, south of most of the chaparral, in the southwestern portion of the subarea. Forest and Woodlands communities are most common along the southwestern subarea boundary. Juniper woodlands occur north of El Rancho Verde and north of the Santa Ana River north of North Redlands.

The following sensitive transitional scrub, chaparral, and woodland alliances may occur in the Valley subarea. Ceanothus Mixed Chaparral may include three sensitive alliances: *Ceanothus (oliganthus, tomentosus)*, *Ceanothus greggii*, and *Ceanothus verrucosus*. Sensitive chamise alliances that may occur in the subarea include *Adenostoma fasciculatum – Salvia apiana* and *Adenostoma fasciculatum – Xylococcus bicolor*. Opuntia littoralis is a sensitive alliance that would be considered Coastal Cactus. Encelia Scrub would include the sensitive *Encelia californica – Eriogonum cinereum* alliance. California Walnut would be synonymous with the sensitive *Juglans californica* alliance.

Developed and Agriculture

Areas of development and agriculture occupy 70% of the Valley subarea. Most of this area is developed or disturbed, which occurs throughout the subarea except for a relatively large piece in the southwestern portion of the subarea west of SR-71.

Agriculture is second to development in the subarea with the largest agricultural area in the southwestern portion of the subarea west of I-15 and south of SR-60. Sizeable but more scattered areas of agriculture also occur in the eastern portion of the subarea. The largest barren area is east of Reche Canyon in the southeastern portion of the subarea. Stands of eucalyptus naturalized forest are scattered throughout the subarea.

3.1.1.3 Focal Species

There are 25 focal species in the Valley subarea as listed in Table 3-3. In accordance with Regional Conservation Investment Strategies Program Guidelines, the selected focal species include indicator species for all major or unique vegetation communities, represent all taxonomic groups, incorporate wide-ranging species, and include relevant SWAP 2015 designated climate vulnerable species.

As part of the Focal Species selection process, species were selected to be focal species in the Valley subarea, in part, based on the Focal Species *purpose statement* developed for each subarea. The Focal Species purpose statement for the Valley subarea was:

> *Focal Species in the Valley Subarea are species that most often require mitigation under state and/or federal permitting and environmental review processes and species that best represent the remaining important habitat areas of the Valley, most notably areas of Riversidean alluvial fan sage scrub, riparian and wetland habitats, transitional foothill habitats, and grasslands, such that developing an RCIS conservation strategy for the focal species benefits the whole suite of species that depend on those habitats.*

Appendix A includes Valley subarea focal species summaries developed and referenced with the best available scientific literature. Each summary includes regulatory status, a species distribution map and description of occurrences, ecological requirements, and a discussion of pressures and stressors.

Table 3-3
Focal Species List for the Valley Subarea

Common Name	Scientific Name	Status
Amphibian and Reptile		
Blainville's (coast) horned lizard*	*Phrynosoma blainvillii*	BLM:S, CDFW:SSC
California red-legged frog	*Rana draytonii*	FT, CDFW:SSC
San Bernardino ringneck snake	*Diadophis punctatus modestus*	USFS:S
western pond turtle*	*Emys marmorata*	BLM:S, CDFW:SSC, USFS:S
western spadefoot	*Spea hammondii*	BLM:S, CDFW:SSC
Bird		
Bell's sparrow	*Artemisiospiza belli belli*	CDFW:WL, USFWS:BCC
burrowing owl*	*Athene cunicularia*	BLM:S, CDFW:SSC, USFWS:BCC
coastal California gnatcatcher	*Polioptila californica californica*	FT, CDFW:SSC
least Bell's vireo*	*Vireo bellii pusillus*	FE, SE
southwestern willow flycatcher*	*Empidonax traillii extimus*	FE, SE, USFS:S,
tricolored blackbird*	*Agelaius tricolor*	ST, BLM:S, USFWS:BCC
white-tailed kite	*Elanus leucurus*	BLM:S, CDFW:FP
western yellow-billed cuckoo*	*Coccyzus americanus occidentalis*	FT, SE, BLM:S, USFS:S, USFWS:BCC
Fish		
arroyo chub	*Gila orcuttii*	CDFW:SSC, USFS:S
Santa Ana speckled dace	*Rhinichthys osculus* ssp. *3*	CDFW:SSC, USFS:S
Santa Ana sucker	*Catostomus santaanae*	FT

Table 3-3
Focal Species List for the Valley Subarea

Common Name	Scientific Name	Status
Invertebrate		
Delhi Sands flower-loving fly	*Rhaphiomidas terminatus abdominalis*	FE
Mammal		
Los Angeles pocket mouse	*Perognathus longimembris brevinasus*	CDFW:SSC
mountain lion	*Puma concolor*	CDFW Specially Protected Species
San Bernardino kangaroo rat	*Dipodomys merriami parvus*	FE, CDFW:SSC
Plant		
Gambel's water cress	*Nasturtium gambelii*	FE, ST, CRPR 1B.1
marsh sandwort	*Arenaria paludicola*	FE, ST, CRPR 1B.1
San Bernardino aster*	*Symphyotrichum defoliatum*	BLM:S, CRPR 1B.2
Santa Ana River woolly-star	*Eriastrum densifolium* ssp. *sanctorum*	FE, SE, CRPR 1B.1
slender-horned spineflower	*Dodecahema leptoceras*	FE, SE, CRPR 1B.1

"*" Denotes focal species in both the Valley and West Desert subareas

BLM:S – Bureau of Land Management "Sensitive"
CDFW – California Department of Fish and Wildlife
SSC – Species of Special Concern
FP – Fully Protected
WL – Watch List
G1 – Global ranking of "Critically Imperiled" – at very high risk of extinction due to extreme rarity, very steep declines, or other factors
S1 – State ranking of "Critically Imperiled" – critically imperiled in the state because of extreme rarity or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the state.
CRPR – California Rare Plant Rank
1B.1 – Plants Rare, Threatened, or Endangered in California and Elsewhere; Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
1B.2 – Plants Rare, Threatened, or Endangered in California and Elsewhere; Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
FT – Federally Threatened
FE – Federally Endangered
ST – State Threatened
SE – State Endangered
SBC General Plan – Protections under the San Bernardino General Plan and development code
USFS:S – United States Forest Service "Sensitive"
USFWS:BCC – United States Fish and Wildlife Service "Bird of Conservation Concern"

The information provided in Appendix A provides detailed information regarding the focal species, including information on occurrence in the RCIS area, species range, and habitat associations. In order to have GIS-based mapping focal species distributions for use in developing the SBC RCIS, a focal species habitat dataset was developed. For species with existing, reliable species distribution models, these existing datasets were used, including models developed by US Geological Survey (USGS), UC Davis, and Conservation Biology Institute (CBI). For species without existing, reliable species distribution models covering the RCIS area, simple coverages were developed using available appropriate species-specific information, including vegetation community associations, range information, occurrence information,

designated critical habitat, soils, and elevation. These species habitat coverages are intended represent a reasonable approximation of the potentially suitable habitat areas for each focal species in the RCIS area, based on existing information, to be used as a tool for RCIS development. In cases where existing models were not available, the habitat areas are not the product of statistically-rigorous modeling. These species habitat areas should not be used to determine where the species occurs or does not occur. Appendix B provides detailed information on the data sources and approach to developing the species habitat areas for each focal species.

Table 3-4 provides an acreage summary of the focal species habitat within the Valley subarea of the RCIS area. To understand how Focal Species richness was distributed across the RCIS area, a Focal Species habitat "heat map" was prepared (Figure 3-3). The Focal Species heat map was prepared by simply overlaying all the species habitat coverages, and counting the overlapping species habitats. The Focal Species richness values range for 0 to 18; areas of 0-3 overlapping species were considered to have low Focal Species richness, areas with 4-7 overlapping species were considered to have moderate Focal Species richness, areas with 8 or more overlapping species were considered to have high Focal Species richness (Figure 3-4). Table 3-5 provides a summary of Focal Species richness of the Valley subarea.

Table 3-4
Focal Species Habitat in the Valley Subarea

Focal Species	Species Habitat Acreage
Amphibian and Reptile	
coast horned lizard*	92,259
California red-legged frog	--
San Bernardino ringneck snake	18,840
western pond turtle*	2,878
western spadefoot	54,920
Bird	
Bell's sparrow	92,259
burrowing owl*	280,630
coastal California gnatcatcher	35,909
least Bell's vireo*	2,878
southwestern willow flycatcher*	2,878
tricolored blackbird*	22,883
western yellow-billed cuckoo*	2,878
white-tailed kite	56,035
Fish	
arroyo chub	2,184
Santa Ana speckled dace	2,249
Santa Ana sucker	2,184

Table 3-4
Focal Species Habitat in the Valley Subarea

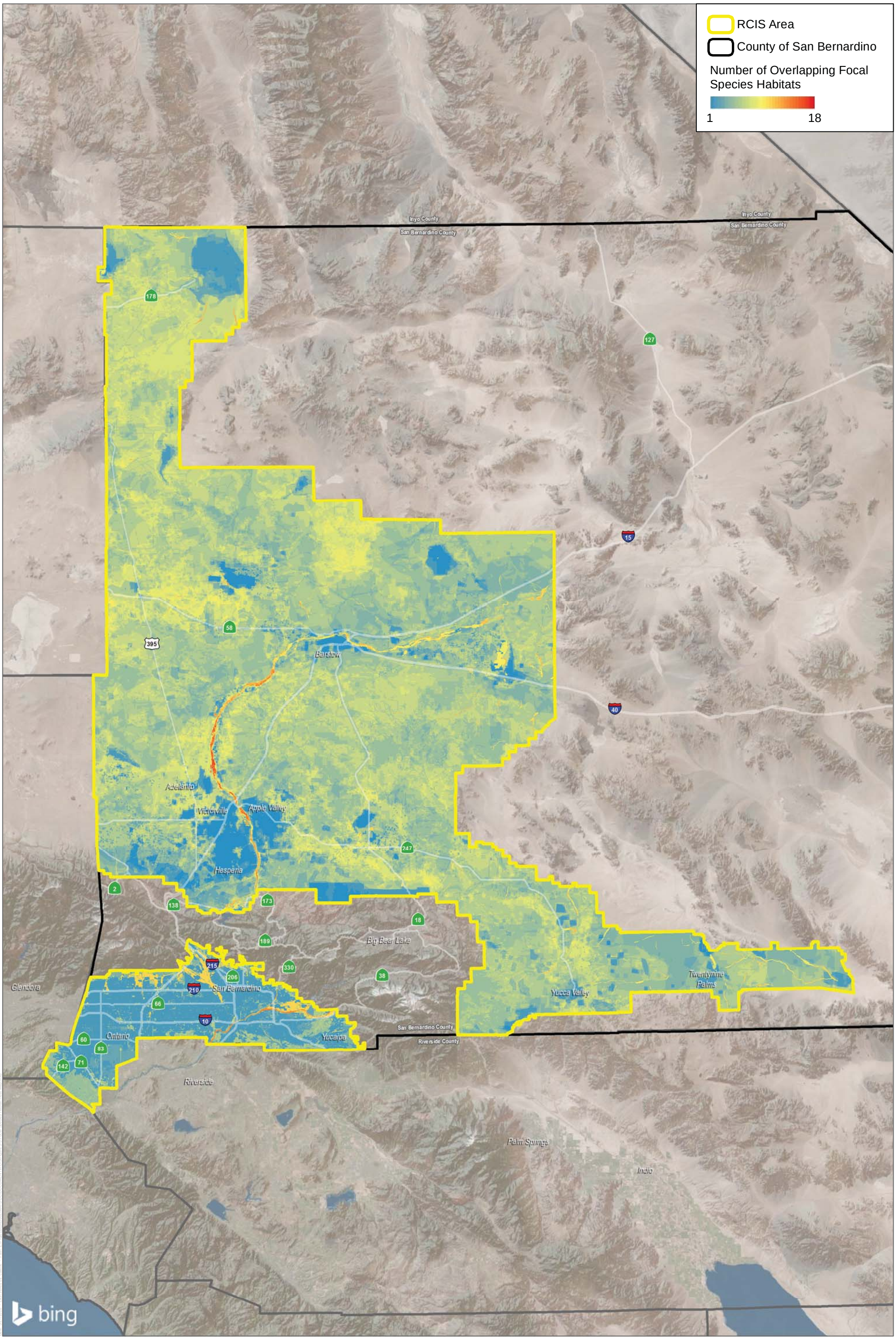
Focal Species	Species Habitat Acreage
Invertebrate	
Delhi Sands flower-loving fly	2,327
Mammal	
Los Angeles pocket mouse	18,840
mountain lion	319,587
San Bernardino kangaroo rat	18,840
Plant	
Gambel's water cress	--
marsh sandwort	--
San Bernardino aster*	2,878
Santa Ana River woolly-star	18,840
slender-horned spineflower	18,840

"*" Denotes focal species in both the Valley and West Desert subareas
"—" Denotes focal species for which species habitat areas were not developed due to lack of information.

Table 3-5
Focal Species Richness in the Valley Subarea

Focal Species Richness Class[1]	Acreage
Low	224,376
Moderate	74,605
High	20,608

[1] Focal Species richness calculated based on overlaying the Focal Species habitat areas
Low = 0-3 Focal Species, Moderate = 4-7 Focal Species, High = 8 or more Focal Species.



SOURCE: Bing Maps 2018; San Bernardino County 2018

DUDEK

0 12.5 25 Miles

FIGURE 3-3

Focal Species Habitat Heat Map

San Bernardino County RCIS

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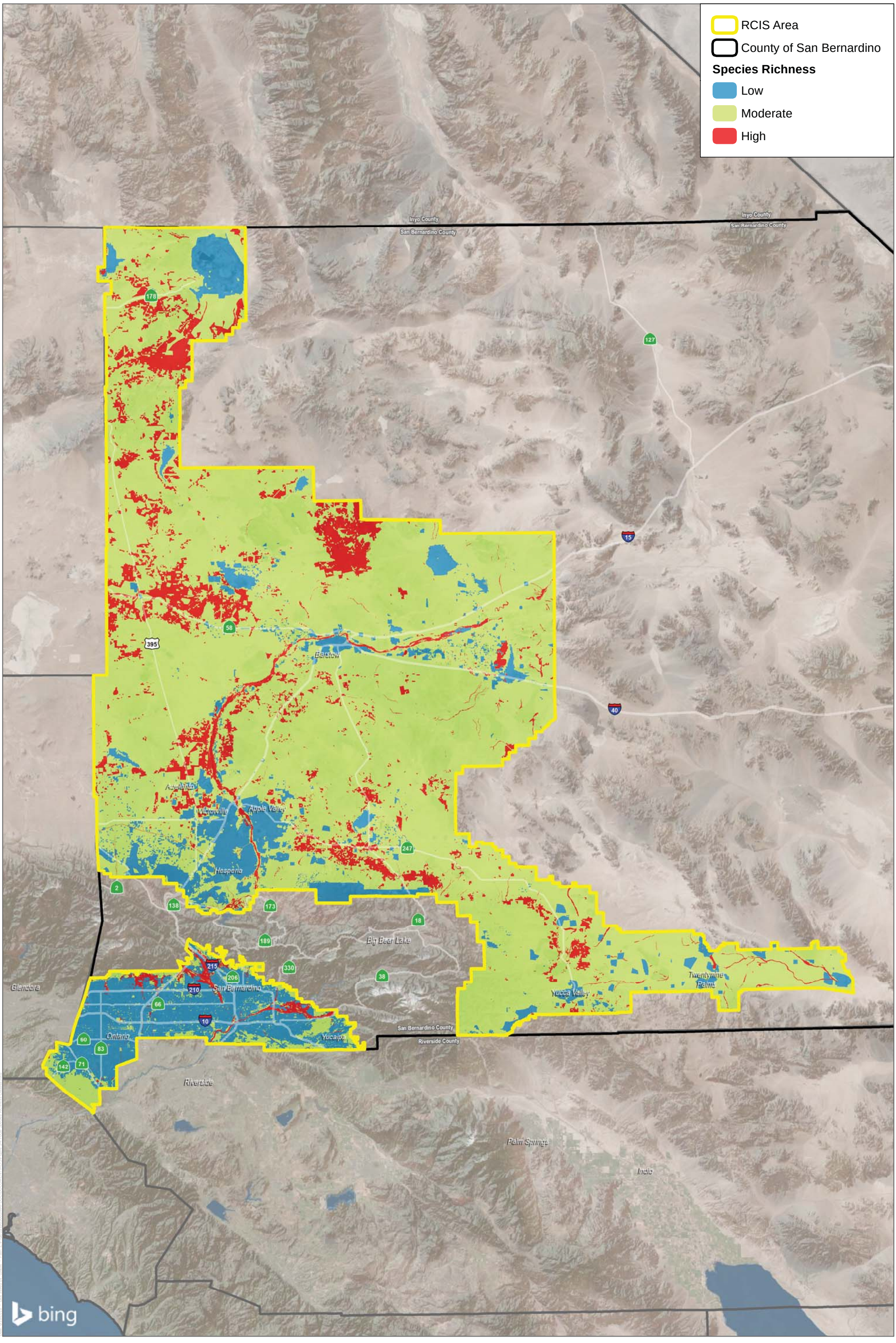

SOURCE: Bing Maps 2018; San Bernardino County 2018

DUDEK

0 12.5 25 Miles

FIGURE 3-4

Focal Species Richness Classes

San Bernardino County RCIS

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3.1.2 West Desert Subarea

For the primary purpose of organizing and conveying conservation element information in the SBC RCIS conservation strategy, habitat groups were established. Habitat groups are logical assemblages of conservation elements that are addressed by the conservation strategy. Habitat groups provide a straightforward way of aggregating information on vegetation communities, Focal Species, and the associated landscape processes throughout the SBC RCIS (Table 3-6)

The Focal Species for the West Desert subarea were selected based on the approach described in Section 3.1.2.3 including to include those species that "best represent the important landscape features, ecological processes, and habitats of the West Desert". Therefore, the Focal Species assigned to each habitat group are intended to be representative of those habitats, and a Focal Species may be representative of more than one habitat group. Spatially, the habitat groups can be mapped based on the mapping of the vegetation communities that comprise each group; however, the mapping of each habitat group was not used to map the distribution of the Focal Species. As described in Section 3.1.2.3, Focal Species-species habitat areas have been developed for each species to map their potential distribution.

3.1.2.1 Landscape Processes and Features

Hydrological Processes and Features

The riparian and wetland habitat group is supported by hydrological features that maintain aquatic and terrestrial habitat quality for Focal Species. Section 2.4 provides the hydrology context and setting, including a discussion of important rivers and washes, dry lakes, seep/springs, and other important features supported these processes.

Aeolian Processes and Features

In addition to hydrological processes, Aeolian (wind-driven) processes are a strong influence on the landforms of the desert region. Dune and playa habitats and features are created and maintained by these processes. Section 2.4 provides the landscape context and setting related to Aeolian processes, include a description of important sand transport corridors and deposition areas (e.g., dunes, sheets, hummocks).

Table 3-6
Habitat Groups for the Focal Species in the West Desert Subarea

Habitat Group	General Vegetation Communities	Focal Species	
Desert Scrub	Sonoran and Mojavean Desert Scrub Alkali Scrub Barren	Agassiz's desert tortoise burrowing owl American badger golden eagle desert bighorn sheep desert kit fox Le Conte's thrasher Mohave ground squirrel	pallid bat Townsend's big-eared bat alkali mariposa-lily Barstow woolly sunflower Mojave monkeyflower Lane Mountain milkvetch Parish's daisy
Dune and Playa	Desert Dunes Playas	Mohave fringe-toed lizard	pallid bat
Grassland	Native Grassland Non-native Grassland	Blainville's horned lizard burrowing owl golden eagle	Swainson's hawk American badger pallid bat
Riparian and Wetland	Riparian and Desert Wash Wetlands and Waters	arroyo toad western pond turtle golden eagle least Bell's vireo southwestern willow flycatcher Swainson's hawk tricolored blackbird yellow-billed cuckoo	Mojave river vole Mohave tui chub pallid bat Townsend's big-eared bat Victorville shoulderband alkali mariposa-lily San Bernardino aster
Transitional Scrub, Chaparral, and Woodland	Chaparral Coastal Scrub Forest and Woodlands Great Basin Scrub Joshua Tree Woodland Juniper Woodlands Riversidean Alluvial Fan Sage Scrub	Blainville's horned lizard burrowing owl golden eagle Swainson's hawk desert bighorn sheep American badger pallid bat	Joshua tree Le Conte's thrasher Mojave monkeyflower Parish's daisy Short-joint beavertail Lane Mountain milkvetch
Developed and Agriculture	Agriculture Developed and Disturbed Areas	burrowing owl Swainson's hawk	tricolored blackbird pallid bat

Notes: Individual Focal Species may be members of more than one habitat group.

Habitat Connectivity and Wildlife Movement

As described in the habitat connectivity and wildlife movement discussion provided in Section 3.1.1.1 for the Valley, interconnected habitat blocks function better than isolated habitat blocks, and wildlife movement areas between larger habitat patches are referred to as habitat linkages or movement corridors. Regional habitat connectivity modeling has been conducted in the RCIS, including several studies covering the West Desert subarea. Figure 3-1 illustrates that there are

numerous pathways connecting core habitat areas of the West Desert with overlapping pathways potential indicating an area's importance for wildlife movement.

Other Important Landscape Features

- San Bernardino Mountain foothills: These areas of West Desert support important habitat for Focal Species, provide important connectivity to the adjacent Mountain region, and occur on an elevational gradient that can provide climate refugia and allow for species adaptation to changing climate conditions.
- Other desert mountain ranges: Other mountain ranges in the West Desert region, like for example the Granite Mountains south of Barstow, provide important habitat for Focal Species (e.g., golden eagle) and are also along elevational gradients that can provide climate refugia and allow for species adaptive to changing climate conditions.
- Working lands: Working lands generally refers to land uses associated with farming or ranching that typically includes a mixture of agricultural habitats, riparian/wetland habitats and/or grasslands that can be important for Focal Species. Important working lands in the West Desert are located in El Mirage valley and Newberry Springs/lower Mojave River Valley.
- Unique geologic formations: The Mojave Desert is known for unique and irreplaceable geologic formations like desert pavement, desert varnish, and volcanic cinder cones and lava beds.

3.1.2.2 Vegetation Communities

As described above under Section 3.1.1.2, vegetation communities are classified and described based on uniformity and reoccurrence of plant species structure and composition across the landscape. The SBC RCIS classifies and describes vegetation communities at the general Vegetation Community level and the mid-level Vegetation Type based on data from multiple sources, as described in Section 3.1.1.2. Table 3-7 provides a summary of the general vegetation communities and mid-level vegetation types by habitat group for the West Desert subarea. Figure 3-2 shows the habitat groups and general vegetation communities in the RCIS area.

Table 3-7
Vegetation Communities and Land Covers in the West Desert Subarea

HABITAT GROUP **Top-Level Vegetation** Mid-Level Vegetation	**Acreage**
DESERT SCRUB	
Alkali Scrub	**192,004**
North American warm desert bedrock cliff and outcrop	3,428
Shadscale - saltbush cool semi-desert scrub	48,113
Southwestern North American salt basin and high marsh	140,463
Barren	**38,719**
Barren	57
North American warm desert bedrock cliff and outcrop	38,662
Sonoran and Mojavean Desert Scrub	**2,307,782**
Arizonan upland Sonoran desert scrub	2,578
Creosote Bush	115
Desert Mixed Shrub	917
Intermontane deep or well-drained soil scrub	48,408
Intermontane seral shrubland	6,363
Lower Bajada and Fan Mojavean - Sonoran desert scrub	2,126,708
Mojave and Great Basin upper bajada and toeslope	107,642
Mojavean semi-desert wash scrub	11,005
North American warm desert dunes and sand flats	44
Sonoran-Coloradan semi-desert wash woodland/scrub	4,003
DUNE AND PLAYA	
Desert Dunes	**12,601**
North American warm desert dunes and sand flats	12,601
Playa	**64,621**
North American Warm Desert Alkaline Scrub and Herb Playa and Wet Flat	55,233
Southwestern North American salt basin and high marsh	9,388
GRASSLAND	
Native Grasslands	**44**
Southern Great Basin semi-desert grassland	44
Non-Native Grassland	**68,914**
Annual Grasses and Forbs	35
California Annual and Perennial Grassland	67,822
California annual forb/grass vegetation	1,057
RIPARIAN AND WETLAND	
Riparian and Desert Wash	**28,006**
Fremont Cottonwood	3
Madrean Warm Semi-Desert Wash Woodland/Scrub	9,825
Mojavean semi-desert wash scrub	1,705
North American warm desert dunes and sand flats	4,431
Riparian Mixed Hardwood	0
Sonoran-Coloradan semi-desert wash woodland/scrub	2,482
Southwestern North American riparian evergreen and deciduous woodland	3,210
Southwestern North American riparian/wash scrub	6,299
Willow	43

Table 3-7
Vegetation Communities and Land Covers in the West Desert Subarea

HABITAT GROUP Top-Level Vegetation Mid-Level Vegetation	Acreage
Willow (Shrub)	7
Wetlands and Waters	**9,712**
Agriculture Pond or Water Feature	1
Arid West freshwater emergent marsh	104
Californian warm temperate marsh/seep	409
Intermittent Stream Channel	18
Madrean Warm Semi-Desert Wash Woodland/Scrub	5,660
Open Water	1
Riparian	224
Southwestern North American salt basin and high marsh	846
Wetland	2,451
TRANSITIONAL SCRUB, CHAPARRAL, AND WOODLAND	
Chaparral	**31,623**
Californian mesic chaparral	1,587
Californian xeric chaparral	13,799
Chamise	208
Curlleaf Mountain Mahogany	51
Great Basin - Mixed Chaparral Transition	4,061
Lower Montane Mixed Chaparral	85
Scrub Oak	500
Semi-Desert Chaparral	44
Soft Scrub Mixed Chaparral	7
Tucker / Muller Scrub Oak	317
Upper Montane Mixed Chaparral	14
Western Mojave and Western Sonoran Desert borderland chaparral	10,951
Coastal Scrub	**21,363**
Central and south coastal California seral scrub	826
Central and South Coastal Californian coastal sage scrub	20,537
Forest and Woodlands	**44,558**
Californian broadleaf forest and woodland	44
Californian montane conifer forest	37,784
Canyon Live Oak	184
Eastside Pine	127
Great Basin Pinyon - Juniper Woodland	2,133
Mixed Conifer - Fir	0
Singleleaf Pinyon Pine	4,287
Great Basin Scrub	**70,475**
Basin Sagebrush	207
Blackbush	758
Great Basin - Desert Mixed Scrub	137
Great Basin Mixed Scrub	3,931
Intermontane deep or well-drained soil scrub	7,277
Intermontane seral shrubland	11,779

Table 3-7
Vegetation Communities and Land Covers in the West Desert Subarea

HABITAT GROUP Top-Level Vegetation Mid-Level Vegetation	Acreage
Inter-Mountain Dry Shrubland and Grassland	42,221
Intermountain Mountain Big Sagebrush Shrubland and steppe	1,238
Mojave and Great Basin upper bajada and toeslope	198
Rabbitbrush	2,728
Joshua Tree Woodland	**78,623**
Joshua Tree	123
Mojave and Great Basin upper bajada and toeslope	78,500
Juniper Woodlands	**49,455**
California Juniper (shrub)	1,268
Great Basin Pinyon - Juniper Woodland	48,187
DEVELOPED AND AGRICULTURE	
Agriculture	**16,735**
Developed and Disturbed Areas	**221,627**
West Desert Subarea Total	**3,256,862**

Desert Scrub

Desert scrub is the most common habitat group in the West Desert subarea, occurring over 78% of the subarea. It generally occurs over the entire subarea except for the southwestern edge. Sonoran and Mojavean Desert Scrub communities are the most common desert scrub group, 92% of which are composed of Lower Bajada and Fan Mojavean - Sonoran desert scrub. Sonoran and Mojavean Desert Scrub occur over most of the subarea except for the southwestern edge and some pockets located centrally in the subarea and at Searles Lake. Alkali scrub occurs in some of those central pockets, primarily west of Barstow, but also around waterbodies, such as Searles Lake, China Lake, Dale Lake, and Lucerne Lake. Barren areas are mainly south of Searles Valley, between Morongo and Yucca Valleys, and north of Yucca Valley.

The following sensitive desert scrub alliances and associations occur in the West Desert subarea (CDFW 2013): *Achnatherum speciosum, Encelia (actoni, virginensis), Gutierrezia sarothrae, Krascheninnikovia lanata, Lycium cooperi, Menodora spinescens, Purshia tridentata, Yucca brevifolia, Yucca brevifolia - Juniperus californica / Ephedra nevadensis* woodland association, and *Yucca brevifolia / Larrea tridentata - Yucca schidigera / Pleuraphis rigida* woodland association.

Dune and Playa

Dunes and playas occur over 2% of the West Desert subarea. Desert dunes occur east of Barstow. Playas occur at Searles Lake, China Lake, and includes other unnamed playas north and east of Barstow, as well as Lucerne Lake and Rabbit Lake east of Apple Valley. In the southern portion of the subarea, playas occur at Dale Lake east of Twentynine Palms and Coyote Lake west of Twentynine Palms.

The following sensitive dune communities occur in the West Desert subarea (CDFW 2013): *Panicum urvilleanum*, *Pleuraphis rigida* alliance, and *Prosopis glandulosa*.

Grassland

Grasslands occur over 2% of the West Desert subarea. Non-native grasslands predominantly occur along the Mojave River, east of Hesperia, and in the foothill region from Morongo Valley north to Cushenbury in the southwestern portion of the subarea. Native grasslands are far less common than non-native grasslands and occur along the northern subarea boundary southeast of Slocum Mountain.

There are no sensitive grassland communities mapped in the West Desert Subarea (CDFW 2013).

Riparian and Wetland

Riparian and wetland areas only occur over 1% of the West Desert subarea. Riparian and Desert Wash vegetation communities occur primarily around Searles Lake, along the Mojave River, east of Newbury Springs, and along hydrologic features in the southern portion of the subarea, especially those coming out of the foothill regions to the northeast. Wetlands and waters occur primarily along the Mojave River and Governor Edmund G Brown East Branch California Aqueduct. There are also waters and wetlands around China Lake in the northern portion of the subarea.

The following sensitive riparian wash vegetation communities have been mapped in the West Desert subarea (CDFW 2013): *Brickellia incana*, *Chilopsis linearis*, *Chilopsis linearis Association*, *Ephedra californica*, *Ericameria paniculata*, *Forestiera pubescens*, *Hyptis emoryi*, *Lepidospartum squamatum*, *Prosopis glandulosa*, *Prunus fasciculate*, *Psorothamnus spinosus*, and *Sambucus nigra*. The following sensitive riparian woodland vegetation communities have been mapped in the West Desert subarea (CDFW 2013): *Salix laevigata*, *Platanus racemosa*, and *Populus fremontii*. The following sensitive wetland communities have been mapped in the subarea: *Allenrolfea occidentalis*, *Atriplex parryi*, *Frankenia salina*, and *Isocoma acradenia* (CDFW 2013).

Transitional Scrub, Chaparral, and Woodland

Approximately 9% of the West Desert subarea is transitional scrub, chaparral, and woodland. Chaparral occurs along the southwestern boundary of the subarea and up into the hills north of Yucca Valley. Coastal scrub occurs in a few areas in the northern portion of the subarea, but primarily occurs in the southern portion of the subarea from the foothills of Mount San Antonio northeast beyond Apple Valley and east beyond Cushenbury. Great Basin scrub is more common than coastal scrub in the subarea, generally occurring in the southwestern portion from the foothills of Mount San Antonio to Yucca Valley.

Forests and woodlands occur north of Wrightwood in the southwestern corner of the subarea and south of Marinas Ranchos southeast along the boundary of the subarea to Morongo Valley. Joshua Tree Woodland primarily occurs in the foothills of the San Bernardino Mountains and around and north of Yucca Valley and Joshua Tree. Joshua Tree Woodland also occurs west of China Lake Naval Weapons Center in the northern portion of the subarea, north of Barstow, and west of Barstow along the western boundary of the subarea. Juniper woodlands occur in the foothills of the San Bernardino Mountains and around Yucca Valley and Joshua Tree.

Four sensitive Transitional Scrub, Chaparral, and Woodland vegetation communities have been mapped in the West Desert subarea (CDFW 2013). Sensitive chaparral communities include *Fremontodendron californicum* and *Prunus ilicifolia*. Sensitive scrub communities include Ericameria *linearifolia* and *Eriogonum wrightii*. No woodland sensitive vegetation communities have been mapped (CDFW 2013).

Developed and Agriculture

Areas of development and agriculture occupy 7% of the West Desert subarea. The largest concentration of development is at Searles Lake and the adjacent cities of Adelanto, Victorville, Hesperia, and Apple Valley. Developed and agricultural areas also occur in Barstow and scattered east of Barstow and in the southern portion of the subarea associated with the cities of Morongo Valley, Yucca Valley, Joshua Tree, and Twentynine Palms. Agriculture generally occurs north and east of Barstow.

3.1.2.3 Focal Species

There are 30 focal species in the West Desert subarea as listed in Table 3-8. In accordance with Regional Conservation Investment Strategies Program Guidelines, the selected focal species represent all taxonomic groups, include indicator species for all major or unique vegetation communities, incorporate wide-ranging species, and include relevant SWAP 2015 designated climate vulnerable species.

As part of the Focal Species selection process, species were selected to be focal species in the West Desert subarea, in part, based on the Focal Species *purpose statement* developed for each subarea. The Focal Species purpose statement for the West Desert subarea was:

> *Focal species in the West Desert Subarea are species that most often require mitigation under state and/or federal permitting and environmental review processes and species that best represent the important landscape features, ecological processes, and habitats of the West Desert, such that developing an RCIS conservation strategy for the focal species benefits the whole suite of species that depend on those features, processes, and habitats.*

Appendix A includes West Desert Subarea focal species summaries developed and referenced with the best available scientific literature. Each summary includes regulatory status, a species distribution map and description of occurrences, ecological requirements, and a discussion of pressures and stressors.

Table 3-8
Focal Species List for the West Desert Subarea

Common Name	Scientific Name	Status
Amphibian and Reptile		
Agassiz's desert tortoise	*Gopherus agassizii*	FT, ST
arroyo toad	*Anaxyrus californicus*	FT, CDFW:SSC
coast horned lizard*	*Phrynosoma blainvillii*	BLM:S, CDFW:SSC
Mojave fringe-toed lizard	*Uma scoparia*	BLM:S, CDFW:SSC
western pond turtle*	*Emys marmorata*	BLM:S, CDFW:SSC, USFS:S
Bird		
burrowing owl*	*Athene cunicularia*	BLM:S, CDFW:SSC, USFWS:BCC
golden eagle	*Aquila chrysaetos*	BLM:S, CDFW:FP, CDFW:WL
Le Conte's thrasher	*Toxostoma lecontei*	USFWS:BCC
least Bell's vireo*	*Vireo bellii pusillus*	FE, SE
southwestern willow flycatcher*	*Empidonax traillii extimus*	FE, SE, USFS:S
Swainson's hawk	*Buteo swainsoni*	ST, BLM:S, USFWS:BCC
tricolored blackbird*	*Agelaius tricolor*	ST, BLM:S, USFWS:BCC
western yellow-billed cuckoo*	*Coccyzus americanus occidentalis*	FT, SE, BLM:S, USFS:S, USFWS:BCC
Fish		
Mohave tui chub	Mohave tui chub	Mohave tui chub
Invertebrate		
Victorville shoulderband	Victorville shoulderband	Victorville shoulderband
Mammal		
American badger	*Taxidea taxus*	CDFW:SSC

Table 3-8
Focal Species List for the West Desert Subarea

Common Name	Scientific Name	Status
desert bighorn sheep	*Ovis canadensis nelsoni*	BLM:S, CDFW:FP, USFS:S
desert kit fox	*Vulpes macrotis arsipus*	CDFW Non-game furbearer
Mohave ground squirrel	*Xerospermophilus mohavensis*	ST, BLM:S
Mojave River vole	*Microtus californicus mohavensis*	CDFW:SSC
pallid bat	*Antrozous pallidus*	BLM:S, CDFW:SSC, USFS:S
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM:S, CDFW:SSC, USFS:S
Plant		
alkali mariposa lily	*Calochortus striatus*	BLM:S, CRPR 1B.2
Barstow woolly sunflower	*Eriophyllum mohavense*	BLM:S, CRPR 1B.2
Joshua tree	*Yucca brevifolia*	CA Native Plant Act, local ordinances
Lane Mountain milkvetch	*Astragalus jaegerianus*	FE, CRPR 1B.1
Mojave monkeyflower	*Diplacus mohavensis*	BLM:S, CRPR 1B.2
Parish's daisy	*Erigeron parishii*	FT, CRPR 1B.1
San Bernardino aster*	*Symphyotrichum defoliatum*	BLM:S, CRPR 1B.2
short-joint beavertail	*Opuntia basilaris* var. *brachyclada*	BLM:S, CRPR 1B.2

"*" Denotes focal species in both the Valley and West Desert subareas

BLM:S – Bureau of Land Management "Sensitive"
CDFW – California Department of Fish and Wildlife
SSC – Species of Special Concern
FP – Fully Protected
WL – Watch List
G1 – Global ranking of "Critically Imperiled" – at very high risk of extinction due to extreme rarity, very steep declines, or other factors
S1 – State ranking of "Critically Imperiled" – critically imperiled in the state because of extreme rarity or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the state.
CRPR – California Rare Plant Rank
1B.1 – Plants Rare, Threatened, or Endangered in California and Elsewhere; Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
1B.2 – Plants Rare, Threatened, or Endangered in California and Elsewhere; Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
FT – Federally Threatened
FE – Federally Endangered
ST – State Threatened
SE – State Endangered
SBC General Plan – Protections under the San Bernardino General Plan and development code
USFS:S – United States Forest Service "Sensitive"
USFWS:BCC – United States Fish and Wildlife Service "Bird of Conservation Concern"

The information provided in Appendix A provides detailed information regarding the focal species, including information on occurrence in the RCIS area, species range, and habitat associations. In order to have GIS-based mapping focal species distributions for use in developing the SBC RCIS, a focal species habitat dataset was developed. For species with existing, reliable species distribution models, these existing datasets were used, including models developed by US Geological Survey (USGS), UC Davis, and Conservation Biology Institute

(CBI). For species without existing, reliable species distribution models covering the RCIS area, simple coverages were developed using available appropriate species-specific information, including vegetation community associations, range information, occurrence information, designated critical habitat, soils, and elevation. These species habitat coverages are intended represent a reasonable approximation of the potentially suitable habitat areas for each focal species in the RCIS area, based on existing information, to be used as a tool for RCIS development. In cases where existing models were not available, the habitat areas are not the product of statistically-rigorous modeling. These species habitat areas should not be used to determine where the species occurs or does not occur. Appendix B provides detailed information on the data sources and approach to developing the species habitat areas for each focal species. Table 3-9 provides an acreage summary of the focal species habitat within the West Desert subarea of the RCIS area.

Table 3-9
Focal Species Habitat in the West Desert Subarea

Focal Species	Species Habitat Acreage
Amphibian and Reptile	
Agassiz's desert tortoise	2,413,061
arroyo toad	9,232
coast horned lizard*	298,144
Mojave fringe-toed lizard	122,190
western pond turtle*	37,719
Bird	
burrowing owl*	2,845,822
golden eagle	2,107,653
Le Conte's thrasher	708,601
least Bell's vireo*	37,719
Southwestern willow flycatcher*	37,719
Swainson's hawk	35,855
tricolored blackbird*	54,453
western yellow-billed cuckoo*	37,719
Fish	
Mohave tui chub	216
Invertebrate	
Victorville shoulderband	10,526
Mammal	
American badger	723,748
desert bighorn sheep	1,460,956
desert kit fox	750,440
Mohave ground squirrel	1,212,475

Table 3-9
Focal Species Habitat in the West Desert Subarea

Focal Species	Species Habitat Acreage
Mojave River vole	10,526
pallid bat	2,807,742
Townsend's big-eared bat	2,673,964
Plant	
alkali mariposa lily	3,867
Barstow woolly sunflower	140,242
Joshua tree	78,623
Lane Mountain milkvetch	35,568
Mojave monkeyflower	162,618
Parish's daisy	167,405
San Bernardino aster*	37,719
short-joint beavertail	12,387

"*" Denotes focal species in both the Valley and West Desert subareas
"—" Denotes focal species for which species habitat areas were not developed due to lack of information.

As described in Section 3.1.1.3, a Focal Species habitat "heat map" was prepared to understand how Focal Species richness was distributed across the RCIS area (see Figure 3-3). Table 3-10 provides a summary of Focal Species richness of the West Desert subarea.

Table 3-10
Focal Species Richness in the West Desert Subarea

Focal Species Richness Class[1]	Acreage
Low	298,095
Moderate	2,704,563
High	349,531

[1] Focal Species richness calculated based on overlaying the Focal Species habitat areas
Low = 0-3 Focal Species, Moderate = 4-7 Focal Species, High = 8 or more Focal Species.

3.2 Conservation Analysis

A conservation gap analysis was conducted to inform the development of conservation goals and objectives (CGOs) for the SBC RCIS (see Section 3.3). A conservation gap analysis is a geographic information system (GIS)-based evaluation of the distribution of biological resources relative to the distribution of existing protected and conserved lands used to identify any "gaps" in protection (e.g., biological resources that are not well protected).

The conservation analysis is intended to provide an early, coarse-scale evaluation of the patterns of resource protection across the RCIS area to inform development of the conservation strategy.

The results of this analysis provide insights on the relative protection or lack of protection for habitat groups and Focal Species habitat; the assigned conservation targets and resulting acreages do not represent the conservation objectives of this strategy or the amount of habitat necessary for Focal Species conservation. See Section 3.2.3 for a discussion of analysis limitations.

Conservation Gap Analysis Land Classes

As described in Section 2.5, the land base of the SBC RCIS area has been grouped into several categories of lands based on land ownership, jurisdiction, and designations. Using the Plan Base and the Local Conserved Land layers for San Bernardino County (see Section 2.5 for a description of these sources), the following groupings of land designations occur in the RCIS area:

- Public Land–Protected Areas
- Local Conserved Lands
- Public Land–Multiple Use
- Other Open Space and Parks
- Military
- Tribal
- Undesignated

For the purposes of the conservation gap analysis, existing protected area were considered to fall into two classes:

- **Areas Protected and Managed for Natural Resources:** This class includes Public Land-Protected Areas and Local Conserved Lands (see Section 2.5 for a description of all the lands that make up these groupings). This class is analogous to the National GAP Status Code 1 and Status Code 2 lands.
- **Areas Protected and Managed for Multiple Uses:** This class includes Public Land-Multiple Use and Other Open Space and Parks (see Section 2.5 for a description of all the lands that make up these groupings). This class is analogous to the National GAP Status Code 3 lands.

Conservation elements in these two classes of lands have some level of existing protection and/or management. Note that local designations and policies (e.g., open space overlays, hillside ordinances) may not be captured within these two broad protected land classes and would not be represented in the analysis. Conservation elements in undesignated areas were considered unprotected (i.e., conservation gaps). Although military and tribal lands support important areas

for biological resources in the RCIS area, particularly in the West Desert subarea, these lands were excluded from the analysis of conservation gaps.

In the SBC RCIS area, San Bernardino County Flood Control District (SBCFCD) owns or has easements over numerous floodways and drainages. These SBCFCD lands, particularly in the Valley subarea, are known to support important areas for the conservation elements. These SBCFCD lands would not be considered protected nor would they be considered undesignated. Therefore, the SBCFCD lands that occur outside existing protected areas are included as a separate category in the conservation gap analysis.

Analysis of Habitat Groups

The land classes described above were then analyzed against the habitat groups to identify the level of existing protection currently afforded to each group. This analysis was used to focus development of the conservation goals and objectives (see Section 3.3). For habitat groups with high levels of existing protection, the conservation strategy may prioritize resource management or enhancement actions over habitat acquisition/protection actions. For habitat groups not well protected in existing protected areas, the conservation strategy may emphasize habitat acquisition/protection and restoration/enhancement actions.

As one frequently used measure of evaluating conservation gaps, conservation targets were assigned to the habitat groups. Conservation targets were assigned using community-based targets often used for vegetation communities in regional conservation planning analyses: a target of 90% was assigned to unique or imperiled vegetation types, a target of 75% was assigned to important native vegetation types, and a target of 50% was assigned to other vegetation types that provide habitat value. These community-based conservation targets were then aggregated on an acreage basis into assigned habitat group conservation targets. The community-based and assigned habitat group conservation targets for the Valley and West Desert subareas are shown in Table 3-11. These conservation targets are not requirements of the SBC RCIS and were used only as relative measure for evaluating the conservation gap analysis.

Analysis of Focal Species Habitat

As described in Section 3.1, habitat coverages were developed to represent a reasonable approximation of the potentially suitable habitat areas for each Focal Species. The land classes described above were analyzed against the Focal Species habitat areas to identify the level of existing protection currently afforded to each Focal Species. For Focal Species with high levels of existing protection, the conservation strategy may prioritize species management actions over habitat acquisition/protection actions. For Focal Species with habitat not well protected in existing protected areas, the conservation strategy may emphasize habitat acquisition/protection

over species management actions in existing protected areas. This analysis was used as one measure of existing Focal Species conservation in the RCIS area.

Table 3-11
Habitat Group General Conservation Targets

Habitat Group	Vegetation Community	Community-Based Conservation Target	Total in RCIS Area (acres)	Assigned Habitat Group Conservation Target
Valley				
Grassland	Native Grasslands	75%	564	**50%**
	Non-Native Grassland	50%	36,283	
Riparian and Wetland	Riparian	90%	970	**90%**
	Wetlands and Waters	90%	1,329	
Riversidean Alluvial Fan Sage Scrub	Riversidean Alluvial Fan Sage Scrub	75%	18,840	**75%**
Transitional Scrub, Chaparral, and Woodland	Chaparral	50%	16,357	**62%**
	Coastal Scrub	75%	17,035	
	Forest and Woodlands	50%	2,570	
	Juniper Woodlands	50%	72	
West Desert				
Desert Scrub	Alkali Scrub	50%	168,949	**50%**
	Barren	50%	36,452	
	Sonoran and Mojavean Desert Scrub	50%	2,127,556	
Dune and Playa	Desert Dunes	75%	11,873	**54%**
	Playa	50%	55,908	
Grassland	Native Grasslands	75%	41	**50%**
	Non-Native Grassland	50%	67,569	
Riparian and Wetland	Riparian and Desert Wash	90%	26,646	**90%**
	Wetlands and Waters	90%	8,472	
Transitional Scrub, Chaparral, and Woodland	Chaparral	50%	31,569	**56%**
	Coastal Scrub	50%	21,061	
	Forest and Woodlands	50%	44,558	
	Great Basin Scrub	50%	69,847	
	Joshua Tree Woodland	75%	74,939	
	Juniper Woodlands	50%	48,648	

Notes: Conservation targets were not set for the developed and agriculture habitat group. The total in the RCIS area excludes acreage that occurs on military or tribal lands.

3.2.1 Valley Subarea

In the approximately 319,600-acre Valley subarea, the RCIS conservation gap analysis was conducted over the 317,049 acres that occur outside military and tribal lands. Overall, approximately 10% of the Valley subarea is in existing protected areas (13,017 acres protected and managed for natural resources; 19,530 acres protected and managed for multiple uses). An additional 5% of the Valley subarea (15,632 acres) occurs within SBCFCD lands.

Valley Habitat Groups

The following provides an analysis of conservation gaps for habitat groups in the Valley subarea. For each habitat group, the implications of the gap analysis results are discussed including a comparison of the existing protection (Table 3-12) relative to the assigned conservation target (Table 3-11).

- **Grassland:** 26% of the grassland habitat group in the Valley subarea are in existing protected areas and an additional 3% occur on SBCFCD lands. Vegetation communities of the grassland habitat group occur in scattered and often isolated locations through the Valley subarea. Although grassland does occur in mosaics with other native vegetation communities, grassland in the Valley subarea occurs largely on undeveloped parcels within urban areas and in association with agricultural areas. Conservation of the grassland habitat group in the Valley subarea is lower than the general assigned target of 50% (7,920-acre conservation gap); however, many of the remaining grassland patches of the Valley are isolated, degraded, provide low habitat quality, and would not be prioritized for conservation. Conservation actions for the grassland habitat group should be strategic and emphasize actions that directly benefit Focal Species or that provide for habitat connectivity.
- **Riparian and Wetland:** 20% of the riparian and wetland habitat group in the Valley subarea are in existing protected areas and an additional 37% occur on SBCFCD lands. Vegetation communities in this habitat group are all considered sensitive and occur along drainages, floodways, and basins often intergrading with Riversidean alluvial fan sage scrub; however, this habitat group also includes unvegetated waterways, floodways and water features that provide minimal terrestrial habitat function. Conservation of this habitat group is considered high priority, including continued management in existing protected areas and SBCFCD lands, habitat acquisition/preservation, habitat establishment/restoration, and habitat enhancement. At an assigned conservation target of 90%, a conservation gap of approximately 757 acres of riparian and wetland habitat group exists in the Valley subarea.

- **Riversidean Alluvial Fan Sage Scrub:** 32% of the Riversidean alluvial fan sage scrub habitat group in the Valley subarea are in existing protected areas and an additional 40% occur on SBCFCD lands. This habitat groups is provides unique and important habitat for a whole suite of Focal Species in the Valley subarea. Conservation of this habitat group is considered high priority, including continued management in existing protected areas and SBCFCD lands, habitat acquisition/preservation, habitat establishment/restoration, and habitat enhancement. With an assigned conservation target of 75%, a conservation gap of 573 acres of Riversidean alluvial fan sage scrub exists in the Valley subarea.
- **Transitional Scrub, Chaparral, and Woodland:** 20% of the transitional scrub, chaparral, and woodland habitat group in the Valley subarea are in existing protected areas and an additional 4% occur on SBCFCD lands. This habitat group includes a variety of scrub, chaparral, and woodland communities of the Valley foothills that provide habitat for Focal Species and habitat connectivity for wildlife movement. Conservation of this habitat group in the Valley subarea is lower than the general assigned target of 62% (13,798-acre conservation gap); a majority of this is conservation gap is for coastal scrub vegetation communities. Conservation of this habitat group should emphasize acquisition/preservation of coastal scrub vegetation communities and actions that directly benefit Focal Species or that provide for habitat connectivity.

Table 3-12
Habitat Group Conservation Gap Analysis – Valley Subarea

Habitat Group	Total In RCIS Area (acres)	Protected and Managed for Natural Resources	Protected and Managed for Multiple Uses	Existing Protected Total	SBCFCD Lands	Existing Protected and SBCFCD Lands
Grassland	36,846	5,708	3,852	9,560 (26%)	1,084	10,644 (29%)
Riparian and Wetland	2,299	158	303	461 (20%)	851	1,312 (57%)
Riversidean Alluvial Fan Sage Scrub	18,840	3,715	2,407	6,122 (32%)	7,435	13,557 (72%)
Transitional Scrub, Chaparral, and Woodland	36,034	3,228	3,996	7,223 (20%)	1,254	8,478 (24%)

Notes: Conservation gap analysis was not conducted for the developed and agriculture habitat group; however, this habitat group covers over 70% of the Valley subarea. Conservation strategy for agricultural and working lands developed independent of the conservation gap analysis. The total in the RCIS area excludes acreage that occurs on military or tribal lands.

Valley Focal Species Habitat

Given that only approximately 10% of the Valley subarea is within existing protected areas, conservation of Focal Species habitat in these areas of the Valley is relatively modest.

Approximately 32% of the focal species habitat for species generally associated with Riversidean alluvial fan sage scrub (i.e., San Bernardino ringneck snake, Los Angeles pocket mouse, San Bernardino kangaroo rat, Santa Ana woollystar, slender-horned spineflower) is conserved in existing protected areas of the Valley. For Focal Species generally associated with the transitional vegetation communities (i.e., Blainville's horned lizard, western spadefoot, Bell's sparrow, coastal California gnatcatcher, and white-tailed kite), habitat conservation in existing protected areas of the Valley ranges from 23-25%. For Focal Species associated with riparian and wetland communities (i.e., western pond turtle, least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo, arroyo chub, Santa Ana sucker, Santa Ana speckled dace, and San Bernardino aster), habitat conservation in Valley existing protected areas ranges from 18-20%. Conservation of habitat for burrowing owl, tricolored blackbird, mountain lion, and Delhi Sands flower-loving fly in existing protected areas of the Valley is 10% of below.

As noted above, SBCFCD lands are not considered protected areas; however, Focal Species habitat occurs on these lands that should be considered, particularly in the Valley subarea. For example, this analysis shows that approximately 70% of the fish Focal Species habitat in the Valley subarea occurs on SBCFCD lands. Combined with existing protected areas, 90% of fish Focal Species habitat in the Valley occurs in existing protected areas or SBCFCD lands. SBCFCD lands are also important to the conservation of the remaining riparian and wetland species and the RAFSS species. Approximately 72% of the Focal Species habitat for species associated with RAFSS occurs in existing protected areas or SBCFCD lands of the Valley. Approximately 57% of the Focal Species habitat for non-fish species associated with riparian and wetland occurs in existing protected areas or SBCFCD lands of the Valley. Although less substantial, Focal Species habitat for species associated with transitional communities and grasslands also occurs within SBCFCD lands. Table 3-13 provides a detailed summary of the conservation gap analysis for Focal Species habitat in the Valley subarea.

Table 3-13
Focal Species Habitat Conservation Gap Analysis – Valley Subarea

Focal Species	Total In RCIS Area (acres)	Protected and Managed for Natural Resources	Protected and Managed for Multiple Uses	Existing Protected Total	SBCFCD Lands	Existing Protected and SBCFCD Lands
Amphibian and Reptile						
Blainville's horned lizard	91,728	12,651	10,254	22,906 (25%)	9,773	32,679 (36%)
California red-legged frog	NA[1]					
San Bernardino ringneck snake	18,840	3,715	2,407	6,122 (32%)	7,435	13,557 (72%)

Table 3-13
Focal Species Habitat Conservation Gap Analysis – Valley Subarea

Focal Species	Total In RCIS Area (acres)	Protected and Managed for Natural Resources	Protected and Managed for Multiple Uses	Existing Protected Total	SBCFCD Lands	Existing Protected and SBCFCD Lands
western pond turtle	2,299	158	303	461 (20%)	851	1,312 (57%)
western spadefoot	54,879	6,943	6,402	13,345 (24%)	8,689	22,035 (40%)
Bird						
Bell's sparrow	91,728	12,651	10,254	22,906 (25%)	9,773	32,679 (36%)
burrowing owl	278,721	9,631	15,231	24,862 (9%)	13,526	38,388 (14%)
coastal California gnatcatcher	35,879	4,907	4,187	9,094 (25%)	8,189	17,283 (48%)
least Bell's vireo	2,299	158	303	461 (20%)	851	1,312 (57%)
southwestern willow flycatcher	2,299	158	303	461 (20%)	851	1,312 (57%)
tricolored blackbird	22,022	9	1,739	1,748 (8%)	762	2,511 (11%)
western yellow-billed cuckoo	2,299	158	303	461 (20%)	851	1,312 (57%)
white-tailed kite	55,332	6,901	5,853	12,754 (23%)	2,492	15,246 (28%)
Fish						
arroyo chub	2,184	291	104	395 (18%)	1,574	1,968 (90%)
Santa Ana speckled dace	2,249	294	126	421 (19%)	1,594	2,015 (90%)
Santa Ana sucker	2,184	291	104	395 (18%)	1,574	1,968 (90%)
Invertebrate						
Delhi Sands flower-loving fly	2,327	180	41	222 (10%)	274	496 (21%)
Mammal						
Los Angeles pocket mouse	18,840	3,715	2,407	6,122 (32%)	7,435	13,557 (72%)
mountain lion	317,058	13,017	19,530	32,546 (10%)	15,631	48,178 (15%)
San Bernardino kangaroo rat	18,840	3,715	2,407	6,122 (32%)	7,435	13,557 (72%)
Plant						
Gambel's water cress	NA[1]					
marsh sandwort	NA[1]					
San Bernardino aster	2,299	158	303	461 (20%)	851	1,312 (57%)
Santa Ana River woollystar	18,840	3,715	2,407	6,122 (32%)	7,435	13,557 (72%)
slender-horned spineflower	18,840	3,715	2,407	6,122 (32%)	7,435	13,557 (72%)

Notes: NA denotes Focal Species for which species habitat areas were not developed due to lack of information; these species are currently extirpated from the Valley subarea and only historical information is available for these species. The total in the RCIS area excludes acreage that occurs on military or tribal lands.

As described in Section 3.1.1.3, the Focal Species habitat areas discussed were overlaid to evaluate the Focal Species richness within the Valley subarea. As shown in Table 3-14, areas of high Focal Species richness have the highest level of current protection (31%); whereas, areas with moderate and low Focal Species richness have lower levels of existing protection at 23% and 4%, respectively. Consistent with the discussion on Focal Species habitat provided above, the SBCFCD lands occur in areas used by multiple Focal Species, comprising 40% of the high Focal Species richness areas in the Valley subarea.

Table 3-14
Focal Species Richness Class Gap Analysis – Valley Subarea

Focal Species Richness Class	Total In RCIS Area (acres)	Protected and Managed for Natural Resources	Protected and Managed for Multiple Uses	Existing Protected Total	SBCFCD Lands	Existing Protected and SBCFCD Lands
Low	222,958	199	8,970	9,170 (4%)	4,967	14,136 (6%)
Moderate	73,676	9,101	7,929	17,030 (23%)	2,449	19,479 (26%)
High	20,425	3,716	2,630	6,346 (31%)	8,216	14,563 (71%)

Notes: The total in the RCIS area excludes acreage that occurs on military or tribal lands.

3.2.2 West Desert Subarea

In the approximately 3,256,900-acre West Desert subarea, the RCIS conservation gap analysis was conducted over the 3,025,695 acres that occur outside military and tribal lands. Overall, approximately 57% of the West Desert subarea is in existing protected areas (556,503 acres protected and managed for natural resources; 1,197,260 acres protected and managed for multiple uses). Only 6,399 acres of the West Desert subarea occurs within SBCFCD lands.

West Desert Habitat Groups

The following provides an analysis of conservation gaps for habitat groups in the West Desert subarea. For each habitat group, the implications of the gap analysis results are discussed including a comparison of the existing protection (Table 3-15) relative to the assigned conservation target (Table 3-11).

- **Desert Scrub:** 63% of the desert scrub habitat group in the West Desert subarea are in existing protected areas with less than an additional 1% of desert scrub on SBCFCD lands. Current conservation of the desert scrub habitat group in existing protected areas

exceeds the assigned conservation target of 50% for the desert scrub habitat group; therefore, conservation priorities for this habitat group should focus on Focal Species-specific priorities and management actions within existing protected areas that benefit desert scrub.

- **Dune and Playa:** 71% of the dune and play habitat group in the West Desert subarea are in existing protected areas with less than an additional 1% of dune and playa on SBCFCD lands. Current conservation of the desert scrub habitat group in existing protected areas exceeds the assigned conservation target of 54% for the dune and playa habitat group; therefore, conservation priorities for this habitat group should focus on Focal Species-specific priorities and management actions within existing protected areas that benefit dune and playa.

Table 3-15
Habitat Group Conservation Gap Analysis – West Desert Subarea

Habitat Group	Total In RCIS Area (acres)	Protected and Managed for Natural Resources	Protected and Managed for Multiple Uses	Existing Protected Total	SBCFCD Lands	Existing Protected and SBCFCD Lands
Desert Scrub	2,332,957	434,534	1,024,698	1,459,232 (63%)	1,462	1,460,694 (63%)
Dune and Playa	67,781	3,682	44,512	48,194 (71%)	29	48,222 (71%)
Grassland	67,610	15,709	18,600	34,309 (51%)	611	34,919 (52%)
Riparian and Wetland	35,118	4,261	7,698	11,959 (34%)	3,205	15,164 (43%)
Transitional Scrub, Chaparral, and Woodland	290,624	84,603	60,107	144,710 (50%)	121	144,831 (50%)

Notes: Conservation gap analysis was not conducted for the developed and agriculture habitat group; conservation strategy for agricultural and working lands developed independent of the conservation gap analysis. The total in the RCIS area excludes acreage that occurs on military or tribal lands.

- **Grassland:** 51% of the grassland habitat group in the West Desert subarea are in existing protected areas with less than an additional 1% on SBCFCD lands. Current conservation of the grassland habitat group in existing protected areas exceeds the assigned conservation target of 50% for the grassland habitat group; therefore, conservation priorities for this habitat group should focus on Focal Species-specific priorities and management actions within existing protected areas that benefit dune and playa.
- **Riparian and Wetland:** 34% of the riparian and wetland habitat group in the West Desert subarea are in existing protected areas and an additional 9% occur on SBCFCD lands. Vegetation communities in this habitat group are all considered sensitive and occur along drainages, floodways. With an assigned conservation target of 90%, a conservation

gap of 16,441 acres of riparian and wetland occurs in the West Desert subarea. Conservation of this habitat group is considered high priority, including continued management in existing protected areas and SBCFCD lands, habitat acquisition/preservation, habitat establishment/restoration, and habitat enhancement.

- **Transitional Scrub, Chaparral, and Woodland:** 50% of the transitional scrub, chaparral, and woodland habitat group in the West Desert subarea are in existing protected areas with less than an additional 1% on SBCFCD lands. This habitat group includes a variety of scrub, chaparral, and woodland communities of the West Desert foothills that provide habitat for Focal Species and habitat connectivity for wildlife movement. Conservation of this habitat group in the West Desert subarea is lower than the general assigned target of 56% (19,215-acre conservation gap); a majority of this is conservation gap is for Joshua tree woodland and juniper woodland vegetation communities. Conservation of this habitat group should emphasize acquisition/preservation of Joshua tree woodland and juniper woodland vegetation communities and actions that directly benefit Focal Species or that provide for habitat connectivity.

West Desert Focal Species Habitat

As noted above, approximately 57% of the West Desert subarea is within existing protected areas; therefore, the current level of existing conservation of Focal Species habitat in the West Desert is relatively higher than in the Valley. Habitat for two Focal Species are currently conserved at a high level in existing protected areas: Lane Mountain milk-vetch (93%) and golden eagle (80%). Bighorn sheep, Mojave monkeyflower, and Parish's daisy habitat, which occur largely on public lands, are conserved at greater than 70% in existing protected areas of the West Desert. Focal species that are 50-70% conserved in existing protected areas of the West Desert include Blainville's horned lizard, desert tortoise, burrowing owl, desert kit fox, Mohave ground squirrel, pallid bat, Townsend's big-eared bat, Mohave tui chub, and Barstow woolly sunflower. Habitat for the remainder of the West Desert Focal Species is less than 50% conserved in existing protected areas.

Focal Species associated with riparian and wetland habitats also occur within SBCFCD lands in the West Desert. For example, the suite of riparian bird Focal Species (i.e., least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo) are 34% conserved in existing protected areas with an additional 9% of habitat within SBCFCD lands. In additional to riparian birds, SBDFCD lands in the West Desert are particularly important for species that use habitats along the Mojave River corridor and its tributaries, like the Victorville shoulderband and Mojave River vole (17% of habitat occurs on SBCFCD lands).

Focal Species associated with habitats that occur on primarily on private lands are poorly conserved in existing protected areas of the West Desert, including arroyo toad (13%), Swainson's hawk (9%), tricolored blackbird (23%), Mojave River vole (8%), Victorville shoulderband snail (8%), Joshua tree (19%), and short-joint beavertail (7%). Table 3-16 provides a detailed summary of the conservation gap analysis for Focal Species habitat in the West Desert subarea.

As described in Section 3.1.2.3, the Focal Species habitat areas discussed above to all overlaid to evaluate the Focal Species richness within the West Desert subarea. As shown in Table 3-17, areas of high and moderate Focal Species richness are moderately well protected in existing protected areas at 57% and 60%, respectively. A majority of these existing protected areas, however, include lands managed for multiple uses.

Table 3-16
Focal Species Habitat Conservation Gap Analysis – Valley Subarea

Focal Species	Total In RCIS Area (acres)	Protected and Managed for Natural Resources	Protected and Managed for Multiple Uses	Existing Protected Total	SBCFCD Lands	Existing Protected and SBCFCD Lands
Amphibian and Reptile						
arroyo toad	6,811	28	836	864 (13%)	0	864 (13%)
Blainville's (coast) horned lizard	296,339	90,174	65,306	155,481 (53%)	106	155,587 (53%)
desert tortoise	2,218,668	360,359	957,070	1,317,429 (59%)	4,242	1,321,672 (60%)
Mojave fringe-toed lizard	115,611	14,914	39,162	54,076 (47%)	405	54,480 (47%)
western pond turtle	35,117	4,261	7,698	11,959 (34%)	3,205	15,164 (43%)
Bird						
burrowing owl	2,632,172	450,939	1,065,409	1,516,348 (58%)	3,044	1,519,392 (58%)
golden eagle	1,953,885	690,857	875,767	1,566,624 (80%)	1,728	1,568,352 (80%)
Le Conte's thrasher	655,247	74,613	208,560	283,173 (43%)	1,714	284,888 (43%)
least Bell's vireo	35,117	4,261	7,698	11,959 (34%)	3,205	15,164 (43%)
southwestern willow flycatcher	35,117	4,261	7,698	11,959 (34%)	3,205	15,164 (43%)
Swainson's hawk	34,597	1,243	1,867	3,110 (9%)	1,892	5,002 (14%)
tricolored blackbird	51,852	4,413	7,736	12,150 (23%)	3,232	15,382 (30%)
western yellow-billed cuckoo	35,117	4,261	7,698	11,959 (34%)	3,205	15,164 (43%)
Fish						
Mohave tui chub	144	0	72	72 (50%)	0	72 (50%)

Table 3-16
Focal Species Habitat Conservation Gap Analysis – Valley Subarea

Focal Species	Total In RCIS Area (acres)	Protected and Managed for Natural Resources	Protected and Managed for Multiple Uses	Existing Protected Total	SBCFCD Lands	Existing Protected and SBCFCD Lands
Invertebrate						
Victorville shoulderband	10,326	496	319	814 (8%)	1,734	2,548 (25%)
Mammal						
American badger	695,657	46,042	162,386	208,428 (30%)	4,099	212,527 (31%)
bighorn sheep	1,347,163	414,145	537,653	951,797 (71%)	1,222	953,019 (71%)
desert kit fox	693,885	35,578	308,583	344,161 (50%)	1,196	345,356 (50%)
Mohave ground squirrel	1,071,987	88,014	551,718	639,732 (60%)	1,030	640,762 (60%)
Mojave River vole	10,326	496	319	814 (8%)	1,734	2,548 (25%)
pallid bat	2,598,392	531,763	1,023,457	1,555,221 (60%)	4,868	1,560,089 (60%)
Townsend's big-eared bat	2,465,001	487,604	1,012,583	1,500,187 (61%)	4,873	1,505,060 (61%)
Plant						
alkali mariposa lily	3,867	731	753	1,483 (38%)	0	1,484 (38%)
Barstow woolly sunflower	131,504	1,206	75,853	77,059 (59%)	367	77,427 (59%)
Joshua tree	74,939	9,055	4,998	14,052 (19%)	73	14,125 (19%)
Lane Mountain milk-vetch	27,486	9,948	15,727	25,674 (93%)	0	25,674 (93%)
Mojave monkeyflower	158,628	81,567	36,530	118,097 (74%)	38	118,135 (74%)
Parish's daisy	167,405	67,404	54,171	121,575 (73%)	16	121,591 (73%)
San Bernardino aster	35,117	4,261	7,698	11,959 (34%)	3,205	15,164 (43%)
short-joint beavertail	11,697	0	763	763 (7%)	0	763 (7%)

Notes: The total in the RCIS area excludes acreage that occurs on military or tribal lands.

Table 3-17
Focal Species Richness Class Gap Analysis – West Desert Subarea

Focal Species Richness Class	Total In RCIS Area (acres)	Protected and Managed for Natural Resources	Protected and Managed for Multiple Uses	Existing Protected Total	SBCFCD Lands	Existing Protected and SBCFCD Lands
Low	284,896	4,598	82,241	86,840 (30%)	868	87,707 (31%)
Moderate	2,442,836	500,316	965,208	1,465,524 (60%)	2,105	1,467,629 (60%)
High	298,079	38,577	130,281	168,858 (57%)	3,527	172,386 (58%)

Notes: The total in the RCIS area excludes acreage that occurs on military or tribal lands.

3.2.3 Analysis Limitations

The conservation analysis presented above was used to inform and focus development of the conservation strategy. Interpretation of the analysis results should take into consideration the following:

- "Areas protected and managed for multiple uses" include lands such as BLM ACECs, National Forests, and other public lands and were analyzed here as "protected". Although these lands were classed as protected for purposes of analysis, the conservation value of these lands for Focal Species in many cases would benefit from enhancement actions and other elements of the conservation strategy, particularly in the West Desert subarea.

- SBCFCD lands were not considered protected areas but were separated from other land uses to highlight the overlap of resources. The SBCFCD lands provide important flood and public safety functions while also providing important habitat areas for Focal Species, particularly in the Valley subarea; however, this analysis should not be interpreted as considering these lands conserved.

- The analysis uses assigned targets at a coarse-scale to identify resources with conservation gaps. It was not intended to evaluate the amount of conservation necessary to conserve viable species populations or ecosystem functions. Resources without conservation gaps should not be interpreted as being fully conserved, and the conservation gap acreages should not be interpreted as the amount of required conservation for that resource.

- The analysis does not address habitat quality or value.

Given these analysis limitations, conservation actions implemented under the SBC RCIS should be prioritized according to the conservation goals and objectives (Section 3.3) and the prioritization guidelines (Section 3.4.2) so that conservation gaps are preferentially filled with lands that have high value for Focal Species and ecosystem function based on critical factors such as key species populations, rarity, habitat quality, intactness, and connectivity.

3.3 Conservation Goals and Objectives

As illustrated in Exhibit 1, conservation goals are broad guiding principles that describe a desired future condition for a focal species, other species, or other important conservation element. Conservation objectives are concise, measurable statements of what is to be achieved and that supports a conservation goal (CDFW 2017).

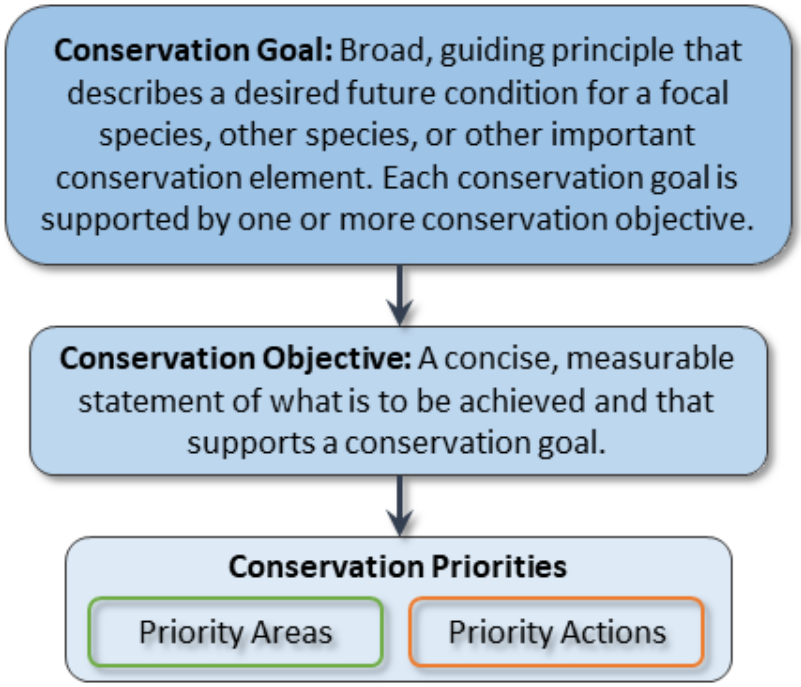


Exhibit 1. Hierarchical Structure of Conservation Goals, Objectives, and Priorities

Additionally, CDFW 2017 advises that:

> *Goals and objectives may be grouped by species, ecological resources, and other conservation elements if a goal or objective addresses multiple conservation elements and their pressures.*
>
> *Measurable objectives in the RCIS should include a description of how they may provide for adaptation opportunities to offset the effects of climate change on focal species. They should also be achievable through either conservation investments or implementing actions to create credits through an MCA in the next 10 years.*

An RCIS's conservation priorities identified in the goals and objectives generally are those that may be fully or partially-achieved within the next 10 years through implementation of the conservation actions and habitat enhancement actions.

As illustrated in Exhibit 1, development of the CGOs is key to identifying the conservation priority areas and actions. In order to provide a comprehensive foundation for the strategy developed for the SBC RCIS, CGOs were developed to address focal species, vegetation communities, and the landscape features and processes that support them. CGOs were developed using the best available information regarding the conservation elements and the landscape setting, as described above in Section 2 and Section 3.1. Further, the CGOs were developed in consideration of existing biological and conservation planning for the RCIS area, including existing recovery plans, habitat conservation plans, resource management planning documents, and critical habitat designations (see Section 2.6). Additionally, regional pressures and stressors (Section 2.7) and resource-specific pressures and stressors were evaluated to target these specific issues in the CGOs. The conservation analysis provided in Section 3.2 was used to focus and make the objectives measurable. Section 3.3.1 provides the CGOs for the Valley (V) subarea, and Section 3.3.2 provides the CGOs for the West Desert (WD) subarea.

As the Focal Species purpose statements indicate (see Section 3.1.1.3 and Section 3.1.2.3), the selected Focal Species are intended to best represent the habitats in each subarea for the benefit of the whole suite of species that use those habitats. For the purpose of CGO development, the Focal Species and vegetation communities have been organized into the habitat groups, as described in the introduction to the conservation elements for each subarea (Section 3.1.1 and Section 3.1.2). Within each habitat group, one or more conservation goals was established. Nested under that goal are one or more conservation objectives addressing the Focal Species, vegetation communities, and other landscape features and processes associated with each habitat group.

3.3.1 Valley Subarea (V)

3.3.1.1 Grassland (GRS)

Goal V-GRS-1: Sustain and enhance the biodiversity and ecological function of the grassland habitat group for the benefit of the vegetation communities, Focal Species, and other species associated with this habitat group in the Valley subarea.

Objective V-GRS-1.1: Continue to maintain and manage GRS habitats in existing protected areas over the next 10 years in the following Valley subarea priority areas:

- Chino Hills State Park

- Prado Basin
- Jurupa Hills
- Colton conservation areas
- Crafton Hills

Objective V-GRS-1.2: Conserve GRS vegetation communities and reduce the threat of habitat loss for Focal Species that utilize GRS habitats[7] by acquiring/preserving currently unprotected GRS habitats over the next 10 years that directly benefit Focal Species and habitat connectivity in the Valley subarea, focusing on the following conservation priority areas:

- Chino Hills
- Jurupa Hills
- Crafton Hills
- San Timeteo Canyon
- Loma Linda Hills
- Reche Canyon
- Other contiguous, intact areas supporting grassland in the Valley, particularly areas supporting Focal Species or contributing to habitat connectivity.

3.3.1.2 Riparian and Wetland (RW)

Goal V-RW-1: Sustain and enhance the biodiversity and ecological function of the riparian and wetland (RW) habitat group for the benefit of the vegetation communities, Focal Species, and other species associated with this habitat group in the Valley subarea.

Objective V-RW-1.1: Continue to maintain and manage RW habitats in existing protected areas over the next 10 years in the following Valley subarea priority areas:

- Chino Hills State Park
- Prado Regional Park
- Lytle Creek
- Cajon Wash

[7] Blainville's horned lizard, burrowing owl, white-tailed kite, Delhi Sands flower-loving fly, western spadefoot, mountain lion

- Other existing protected areas supporting RW habitats

Objective V-RW-1.2: To the extent consistent with the management of flood hazard and human safety, maintain and manage RW habitats on SBCFCD lands over the next 10 years in the following Valley subarea priority areas:

- Devil's Canyon
- Lytle Creek and Cajon Wash
- Santa Ana River
- City Creek
- Mill Creek
- Other Valley drainages and floodways supporting RW habitats

Objective V-RW-1.3: Conserve RW vegetation communities and reduce the threat of habitat loss for Focal Species that utilize RW habitats[8] by acquiring/preserving, establishing (creating), or restoring currently unprotected RW habitats over the next 10 years that directly benefit Focal Species and habitat connectivity for this habitat group in the Valley subarea, focusing on the following conservation priority areas:

- Santa Ana River corridor
- San Timeteo Creek
- Chino Hills State Park
- Prado Basin
- Loma Linda hills
- City Creek
- Plunge Creek
- Mill Creek
- Other Valley and foothill tributaries supporting RW habitats, particularly areas supporting Focal Species or contributing to habitat connectivity.

[8] Western pond turtle, least Bell's vireo, southwestern willow flycatcher, tricolored blackbird, white-tailed kite, yellow-billed cuckoo, arroyo chub, Santa Ana sucker, California red-legged frog, Santa Ana speckled dace, mountain lion, Gambel's watercress, marsh sandwort, and San Bernardino aster

3.3.1.3 Riversidean Alluvial Fan Sage Scrub (RAFSS)

Goal V-RAFSS-1: Sustain and enhance the biodiversity and ecological function of the Riversidean alluvial fan sage scrub habitat group for the benefit of the vegetation communities, Focal Species, and other species associated with this habitat group in the Valley subarea.

Objective V-RAFSS-1.1: Continue to maintain and manage RAFSS habitat in existing protected areas over the next 10 years in the following Valley subarea priority areas:

- Lytle Creek
- Cajon Wash
- North Etiwanda Preserve
- San Sevaine Canyon
- Upper Santa Ana River Wash

Objective V-RAFSS-1.2: To the extent consistent with the management of flood hazard and human safety, maintain and manage RAFSS habitat on SBCFCD lands over the next 10 years in the following Valley subarea priority areas:

- Devil's Canyon
- Lytle Creek and Cajon Wash
- Santa Ana River
- City Creek
- Mill Creek
- Other drainages and floodways supporting RAFSS

Objective V-RAFSS-1.3: Conserve RAFSS vegetation communities and reduce the threat of habitat loss for Focal Species that utilize RAFSS habitat[9] by acquiring/preserving, establishing (creating), or restoring currently unprotected RAFSS habitat over the next 10 years that directly benefit Focal Species and habitat connectivity in the Valley subarea, focusing on the following conservation priority areas:

- Upper Santa Ana River wash

[9] San Diego ringneck snake, Blainville's horned lizard, Western spadefoot, Bell's sparrow, burrowing owl, coastal California gnatcatcher, San Bernardino kangaroo rat, Los Angeles pocket mouse, mountain lion, Santa Ana River woollystar, and slender-horned spineflower

- Lytle Creek
- Cajon Wash
- Reche Canyon
- San Timeteo Canyon
- Other contiguous, intact foothill areas supporting RAFSS in the Valley, including in northern Rancho Cucamonga, Fontana, Highland, and other areas supporting Focal Species or contributing to habitat connectivity.

3.3.1.4 Transitional Scrub, Chaparral, and Woodland (TSCW)

Goal V-TSCW-1: Sustain and enhance the biodiversity and ecological function of the transitional scrub, chaparral, and woodland habitat group for the benefit of the vegetation communities, Focal Species, and other species associated with this habitat group in the Valley subarea.

Objective V-TSCW-1.1: Continue to maintain and manage TSCW habitats in existing protected areas over the next 10 years in the following Valley subarea priority areas:

- Chino Hills State Park
- Jurupa Hills
- Crafton Hills
- Wildwood Canyon State Park
- Oak Glen Preserve
- Glen Helen Regional Park
- Upper Santa Ana River wash
- North Etiwanda Preserve
- Other existing protected areas supporting TSCW habitats.

Objective V-TSCW-1.2: Conserve TSCW vegetation communities and reduce the threat of habitat loss for Focal Species that utilize TSCW habitats[10] by acquiring/preserving or restoring currently unprotected TSCW habitats over the next 10 years that directly benefit Focal Species and habitat connectivity in the Valley subarea, focusing on the following conservation priority areas:

[10] Blainville's horned lizard, Bell's sparrow, coastal California gnatcatcher, white-tailed kite, western spadefoot, mountain lion

- Chino Hills
- Foothills of northern Rancho Cucamonga, Fontana, Highland, and Yucaipa
- Crafton Hills
- San Timeteo Canyon
- Loma Linda Hills
- Reche Canyon
- Jurupa Hills
- Other contiguous, intact areas of TSCW habitat in the Valley, particularly coastal scrub vegetation communities or other TSCW habitats supporting Focal Species or contributing to habitat connectivity.

3.3.1.5 Developed and Agriculture (DA)

Goal V-DA-1: Sustain and enhance the biodiversity and ecological function of the developed and agriculture habitat group for the benefit of the Focal Species and other species associated with this habitat group in the Valley subarea.

Objective V-DA-1.1: Reduce the threat of habitat loss for Focal Species that utilize DA habitats[11] in the Valley subarea by preserving or otherwise maintaining DA habitats that support Focal Species over the next 10 years, focusing on the following conservation priority areas:

- Prado Basin
- Agricultural lands in the eastern Valley areas of Redlands, Mentone, and Yucaipa

3.3.2 West Desert Subarea (WD)

3.3.2.1 Desert Scrub (DS)

Goal WD-DS-1: Sustain and enhance the biodiversity and ecological function of the desert scrub habitat group for the benefit of the vegetation communities, Focal Species, and other species associated with this habitat group in the West Desert subarea.

Objective WD-DS-1.1: Continue to maintain and manage DS habitats in existing protected areas over the next 10 years in the following West Desert priority areas:

[11] burrowing owl, tricolored blackbird, mountain lion

- National Monuments, Parks, Preserves, and Refuges
- BLM Wilderness National Conservation Lands
- BLM Areas of Critical Environmental Concern
- Other BLM lands
- State Parks and other State lands
- Land trust and mitigation lands

Objective WD-DS-1.2: Conserve DS vegetation communities and reduce the threat of habitat loss for Focal Species that utilize DS habitats[12] by acquiring/preserving, restoring, or enhancing currently unprotected DS habitats over the next 10 years that directly benefit Focal Species and habitat connectivity in the West Desert subarea, focusing on the following conservation priority areas:

- Desert tortoise critical habitat units, tortoise conservation areas, and linkages between them in and around the Fremont-Kramer ACEC, Superior-Cronese ACEC, Ord-Rodman ACEC, and Pinto Mountains ACEC.
- Granite Mountain region south of Barstow.
- Morongo Basin
- Mountain and intermountain habitats for desert bighorn sheep, particularly those areas that support perennial and seasonal (i.e., winter storm-monsoonal runoff) streams and rivers, springs, oases, and tinajas (potholes in rocks), or artificial water catchments (guzzlers), between the North San Bernardino Mountains (Cushenbury) and Newberry Mountains to the western boundary of Twentynine Palms Marine Corps Base, Amboy area between Bristol Mountains and Bullion Mountains north of Twentynine Palms Marine Corps Base, and Johnson Valley between the Rodman Mountains and Lava Bed Mountains and the San Bernardino Mountains.
- Mohave ground squirrel key population centers (Coolgardie Mesa-Superior Valley, Edwards Air Force Base, North of Edwards, Ridgecrest, North Searles Valley, and Harper Lake) and habitat linkages (Fremont Valley/Spangler to North of Edwards, Pilot Knob to Coolgardie Mesa-Superior Valley, Harper Lake to Coolgardie Mesa-Superior Valley, and EAFB to North of Edwards and Harper Lake.

[12] Agassiz's desert tortoise, burrowing owl, American badger, golden eagle, desert bighorn sheep, desert kit fox, Le Conte's thrasher, Mohave ground squirrel, pallid bat, Townsend's big-eared bat, alkali mariposa-lily, Barstow woolly sunflower, Mojave monkeyflower, Lane Mountain milkvetch, Parish's daisy

- Other contiguous, intact areas supporting desert scrub in the West Desert, particularly areas supporting Focal Species, contributing to habitat connectivity, or facilitating ecological processes.

3.3.2.2 Dune and Playa (DP)

Goal WD-DP-1: Sustain and enhance the biodiversity and ecological function of the dune and playa habitat group for the benefit of the vegetation communities, Focal Species, and other species associated with this habitat group in the West Desert subarea.

Objective WD-DP-1.1: Continue to maintain and manage DP habitats in existing protected areas over the next 10 years in the following West Desert subarea priority areas:

- El Mirage Dry Lake
- Coyote Dry Lake
- Rabbit Dry Lake
- Lucerne Dry Lake
- Harper Dry Lake
- Troy Dry Lake
- Cuddeback Dry Lake
- Sand deposits associated with the Mojave River east of Barstow
- Other sand dunes, sheets, or deposits in West Desert, particularly those that in Johnson Valley and the Morongo Basin.

Objective WD-DP-1.2: Conserve DP vegetation communities and reduce the threat of habitat loss for Focal Species that utilize DP habitats[13] by acquiring/preserving currently unprotected DP habitats over the next 10 years that directly benefit Focal Species and habitat connectivity in the West Desert subarea, focusing on the conservation priority areas listed above under Objective WD-DP-1.2.

3.3.2.3 Grassland (GRS)

Goal WD-GRS-1: Sustain and enhance the biodiversity and ecological function of the grassland habitat group for the benefit of the vegetation communities, Focal Species, and other species associated with this habitat group in the West Desert subarea.

[13] Mohave fringe-toed lizard, pallid bat

Objective WD-GRS-1.1: Continue to maintain and manage GRS habitats in existing protected areas over the next 10 years.

Objective WD-G-1.2: Conserve GRS vegetation communities and reduce the threat of habitat loss for Focal Species that utilize GRS habitats[14] by acquiring/preserving currently unprotected GRS habitats over the next 10 years, particularly in contiguous, intact areas that support Focal Species or contribute to habitat connectivity, in the West Desert subarea.

3.3.2.4 Riparian and Wetland (RW)

Goal WD-RW-1: Sustain and enhance the biodiversity and ecological function of the riparian and wetland habitat group for the benefit of the vegetation communities, Focal Species, and other species associated with this habitat group in the West Desert subarea.

Objective WD-RW-1.1: Continue to maintain and manage RW habitats wherever they occur in existing protected areas over the next 10 years in the West Desert subarea.

Objective WD-RW-1.2: To the extent consistent with the management of flood hazard and human safety, maintain and manage RW habitats on SBCFCD lands over the next 10 years in the following West Desert subarea priority areas:

- Mojave River and tributaries
- Morongo Basin drainages

Objective WD-RW-1.3: Conserve RW vegetation communities and reduce the threat of habitat loss for Focal Species that utilize RW habitats[15] by acquiring/preserving, establishing (creating), or restoring currently unprotected RW habitats over the next 10 years that directly benefit Focal Species and habitat connectivity in the West Desert subarea, focusing on the following conservation priority areas:

- Mojave River and tributaries, particularly from Mojave Narrows Regional Park to Helendale
- Oro Grande
- Big and Little Morongo Canyons in the Morongo Basin

[14] Blainville's horned lizard, burrowing owl, golden eagle, Swainson's hawk, American badger, pallid bat

[15] arroyo toad, western pond turtle, golden eagle, least Bell's vireo, southwestern willow flycatcher, Swainson's hawk, tricolored blackbird, yellow-billed cuckoo, Mojave river vole, Mohave tui chub, pallid bat, Townsend's big-eared bat, Victorville shoulderband, alkali mariposa-lily, San Bernardino aster

- Little Horsethief Creek and the West Fork Mojave River, in the foothills south of Hesperia in the Summit Valley and Telephone Canyon area
- Wetlands and water features associated with agricultural fields near El Mirage and Newberry Springs
- Seeps and springs wherever they occur, including at Box Springs and Rabbit Springs the Lucerne Valley, Whiskey Springs and Cushenbury Springs in the San Bernardino Mountain foothills, Paradise Springs northeast of Barstow, and in the Morongo Basin
- Other riparian, wetland, wash, and water features in the West Desert, particularly areas supporting Focal Species, contributing to habitat connectivity, or facilitating ecological processes

3.3.2.5 Transitional Scrub, Chaparral, and Woodland (TSCW)

Goal WD-TSCW-1: Sustain and enhance the biodiversity and ecological function of the transitional scrub, chaparral, and woodland habitat group for the benefit of the vegetation communities, Focal Species, and other species associated with this habitat group in the West Desert subarea.

Objective WD-TSCW-1.1: Continue to maintain and manage TSCW habitats in existing protected areas in the following West Desert subarea priority areas:

- San Gorgonio Wilderness Area
- Bighorn Mountain Wilderness Area
- Pipes Canyon and Pioneertown Mountain Preserve
- San Bernardino National Forest
- Granite Mountain Corridor ACEC
- Juniper Flats ACEC
- Big Morongo Canyon
- Mojave River Forks Regional Park
- Land trust and mitigation lands

Objective WD-TSCW-1.2: Conserve TSCW vegetation communities and reduce the threat of habitat loss for Focal Species that utilize TSCW habitats[16] by acquiring/preserving or restoring

[16] Blainville's horned lizard, golden eagle, Swainson's hawk, desert bighorn sheep, American badger, pallid bat, Joshua tree, Le Conte's thrasher, Mojave monkeyflower, Parish's daisy, short-joint beavertail, Lane Mountain milkvetch

currently unprotected TSCW habitats over the next 10 years that directly benefit Focal Species and habitat connectivity in the West Desert subarea, focusing on the following conservation priority areas:

- TSCW habitat areas in the northern San Bernardino Mountain foothills and Little San Bernardino Mountains
- TSCW habitat areas in the foothills south of Apple Valley, particular areas supporting Joshua tree woodland or juniper woodland or areas supporting Focal Species, contributing to habitat connectivity, or facilitating ecological processes.
- TSCW habitat areas in the foothills west of Hesperia in the Baldy Mesa and Phelan area, , particular areas supporting Joshua tree woodland or juniper woodland or areas supporting Focal Species, contributing to habitat connectivity, or facilitating ecological processes.

3.3.2.6 Developed and Agriculture (DA)

Goal WD-DA-1: Sustain and enhance the biodiversity and ecological function of the developed and agriculture habitat group for the benefit of the Focal Species and other species associated with this habitat group in the West Desert subarea.

Objective WD-DA-1.1: Reduce the threat of habitat loss for Focal Species that utilize DA habitats[17] in the West Desert subarea by preserving or otherwise maintaining DA habitats that support Focal Species over the next 10 years, focusing on the following conservation priority areas:

- El Mirage valley agricultural areas
- Newberry Springs/lower Mojave River Valley agricultural areas

3.4 Conservation and Mitigation Actions and Priorities

As shown in Exhibit 1, the CGOs provide the foundation for identifying the conservation actions and priorities of the SBC RCIS. Contributions towards meeting the conservation objectives can be achieved through implementation of a variety conservation and mitigation actions. The selection of the appropriate action(s), which are described in Section 3.4.1, will depend on the specific conservation or mitigation need in each situation. To assure that the conservation and mitigation action achieve the greatest regional conservation benefit, conservation prioritization guidelines are provided in Section 3.4.2 for the Valley and West Desert subareas of the SBC RCIS.

[17] burrowing owl, Swainson's hawk, tricolored blackbird, pallid bat

3.4.1 Actions

The CDFW SWAP identified 11 statewide categories of conservation actions to advance biological conservation objectives in the state (CDFW 2015). These included:

- Planning Actions: Data Collection and Analysis; Partner Engagement; Management Planning; Environmental Review; Land Use Planning; Law and Policy
- Land Acquisition/Protection Actions: Land Acquisition, Easement, and Lease; Economic Incentives
- Land Management Actions: Direct Management; Outreach and Education; Training and Technical Assistance

Some of these statewide conservation categories, like data collection and management and partner engagement, are precursor actions necessary prior to conservation/mitigation action implementation. Other statewide conservation categories, like law and policy, are outside the purview of actions under the SBC RCIS. In identifying the suite of conservation and mitigation actions available for this region, the whole suite of potential available actions were considered.

Table 3-18 and 3-19 were developed to organize and summarize the SBC RCIS conservation actions and link those actions to the conservation objectives and conservation elements (e.g., Focal Species, vegetation communities) for the Valley and West Desert subareas. The information provided in this table is intended to provide the conservation action "toolbox" for entities seeking to implement conservation actions or needing to implement mitigation in these regions. Section 3.4.2 provide a discussion regarding the prioritization of actions in the SBC RCIS.

Table 3-18
Conservation Actions Summary for the Valley Subarea

Conservation Action ID	Conservation Action	Applicable Conservation Objective	Applicable Conservation Elements
	Grassland (GRS)		
V-GRS-CA1	Coordinate with existing land managers to identify and implement management activities within existing protected areas that would maintain and enhance habitat quality for Focal Species in grassland vegetation communities beyond that which is provided by the existing management regime.	V-GRS-1.1	native grasslands non-native grasslands Grassland Focal Species[18]
V-GRS-CA2	Acquire, through fee title or conservation easement, unprotected lands occupied by Focal Species, focusing on identified grassland conservation priority areas in the Valley subarea.	V-GRS-1.2	native grasslands non-native grasslands Grassland Focal Species
V-GRS-CA3	Enhance habitat quality for Focal Species in grassland habitat degraded by invasive plant species through the implementation invasive plant control actions.	V-GRS-1.1 V-GRS-1.2	native grasslands non-native grasslands Grassland Focal Species
V-GRS-CA4	Implement conservation and mitigation actions for burrowing owl consistent with the Staff Report on Burrowing Owl Mitigation (CDFG 2012) or the most current guidance, and if applicable, consistent with the Upper Santa Ana River HCP.	V-GRS-1.1 V-GRS-1.2	burrowing owl
V-GRS-CA5	Implement conservation and mitigation actions for Delhi Sands flower-loving fly consistent with the USFWS Recovery Plan for the species (USFWS 1997a) or the most current guidance and, if applicable, consistent with the Colton HCP and Upper Santa Ana River HCP.	V-GRS-1.1 V-GRS-1.2	Delhi Sands flower-loving fly
	Riparian and Wetland (RW)		
V-RW-CA1	Coordinate with existing land managers to identify and implement management activities within existing protected areas that would maintain and enhance habitat quality for Focal Species in riparian and wetland vegetation communities beyond that which is provided by the existing management regime.	V-RW-1.1 V-RW-1.2	riparian wetlands and waters Riparian and Wetland Focal Species[19]

[18] Blainville's horned lizard, burrowing owl, white-tailed kite, Delhi Sands flower-loving fly, western spadefoot, mountain Lion

[19] Western pond turtle, Least Bell's vireo, southwestern willow flycatcher, tricolored blackbird, white-tailed kite, yellow-billed cuckoo, Arroyo chub, Santa Ana Sucker, California red-legged frog, Santa Ana speckled dace, mountain lion, Gambel's watercress, Marsh Sandwort, San Bernardino aster

Table 3-18
Conservation Actions Summary for the Valley Subarea

Conservation Action ID	Conservation Action	Applicable Conservation Objective	Applicable Conservation Elements
V-RW-CA2	Acquire, through fee title or conservation easement, unprotected lands occupied by Focal Species, focusing on identified riparian and wetland conservation priority areas in the Valley subarea.	V-RW-1.3	riparian wetlands and waters Riparian and Wetland Focal Species
V-RW-CA3	Create and restore riparian and wetland habitat through the development and implementation of habitat restoration plans in suitable locations in conservation priority areas in the Valley subarea.	V-RW-1.1 V-RW-1.2 V-RW-1.3	riparian wetlands and waters Riparian and Wetland Focal Species
V-RW-CA4	Enhance habitat quality for Focal Species in riparian and wetland habitat degraded by invasive plant species (e.g., Arundo, tamarisk) through the implementation invasive plant control actions.	V-RW-1.1 V-RW-1.2 V-RW-1.3	riparian wetlands and waters Riparian and Wetland Focal Species
V-RW-CA5	Enhance habitat quality for Focal Species in riparian and wetland habitat degraded by invasive aquatic species (e.g., bullfrog, African clawed frog, cowbird) through the implementation invasive animal control actions.	V-RW-1.1 V-RW-1.2 V-RW-1.3	riparian wetlands and waters Riparian and Wetland Focal Species
V-RW-CA6	Enhance wildlife movement and habitat connectivity by implementing actions that improve wildlife access to and through riparian and wetland areas in the Valley subarea.	V-RW-1.1 V-RW-1.2 V-RW-1.3	Valley Focal Species
V-RW-CA7	Within the Plan Area of the Upper Santa Ana River HCP, implement conservation and mitigation actions for Riparian and Wetland Focal Species consistent with and complementary to the conservation strategy for the species covered by this HCP.	V-RW-1.2 V-RW-1.3	Santa Ana sucker arroyo chub Santa Ana speckled dace western pond turtle western spadefoot southwestern willow flycatcher least Bell's vireo tricolored blackbird yellow-billed cuckoo

Table 3-18
Conservation Actions Summary for the Valley Subarea

Conservation Action ID	Conservation Action	Applicable Conservation Objective	Applicable Conservation Elements
V-RW-CA8	Implement conservation and mitigation actions for federally-listed Riparian and Wetland Focal Species consistent with USFWS Recovery Plans or the most current guidance.	V-RW-1.1 V-RW-1.2 V-RW-1.3	California red-legged frog least Bell's vireo southwestern willow flycatcher Santa Ana sucker Gambel's watercress Marsh Sandwort
V-RW-CA9	Use approved mitigation/conservation banks and in-lieu fee programs to mitigate for riparian and wetland vegetation and associated Focal Species, as applicable and available within defined service areas.	V-RW-1.3	riparian wetlands and waters Riparian and Wetland Focal Species
Riversidean Alluvial Fan Sage Scrub (RAFSS)			
V-RAFSS-CA1	Coordinate with existing land managers to identify and implement management activities within existing protected areas that would maintain and enhance habitat quality for Focal Species in RAFSS vegetation communities beyond that which is provided by the existing management regime.	V-RAFSS-1.1 V-RAFSS-1.2	Riversidean alluvial fan sage scrub RAFSS Focal Species[20]
V-RAFSS-CA2	Acquire, through fee title or conservation easement, unprotected lands occupied by Focal Species, focusing on identified RAFSS conservation priority areas in the Valley subarea.	V-RAFSS-1.3	Riversidean alluvial fan sage scrub RAFSS Focal Species
V-RAFSS-CA3	Create and restore RAFSS habitat through the development and implementation of habitat restoration plans in suitable locations in conservation priority areas in the Valley subarea.	V-RAFSS-1.1 V-RAFSS-1.2 V-RAFSS-1.3	Riversidean alluvial fan sage scrub RAFSS Focal Species
V-RAFSS-CA4	Enhance habitat quality for Focal Species in RAFSS habitat degraded by invasive plant species through the implementation invasive plant control actions.	V-RAFSS-1.1 V-RAFSS-1.2 V-RAFSS-1.3	Riversidean alluvial fan sage scrub RAFSS Focal Species

[20] San Diego ringneck snake, Blainville's horned lizard, Western spadefoot, Bell's sparrow, burrowing owl, coastal California gnatcatcher, San Bernardino kangaroo rat, Los Angeles pocket mouse, mountain lion, Santa Ana River woollystar, slender-horned spineflower

Table 3-18
Conservation Actions Summary for the Valley Subarea

Conservation Action ID	Conservation Action	Applicable Conservation Objective	Applicable Conservation Elements
V-RAFSS-CA5	Enhance wildlife movement and habitat connectivity by implementing actions that improve wildlife access to and through RAFSS areas in the Valley subarea	V-RAFSS-1.1 V-RAFSS-1.2 V-RAFSS-1.3	Valley Focal Species
V-RAFSS-CA6	Within the Plan Area of the Wash Plan HCP, implement conservation and mitigation actions for RAFSS Focal Species consistent with and complementary to the conservation strategy for the species covered by this HCP.	V-RAFSS-1.1 V-RAFSS-1.2 V-RAFSS-1.3	coastal California gnatcatcher San Bernardino kangaroo rat Santa Ana River woollystar slender-horned spineflower
V-RAFSS-CA7	Within the Plan Area of the Upper Santa Ana River HCP, implement conservation and mitigation actions for RAFSS Focal Species consistent with and complementary to the conservation strategy for the species covered by this HCP.	V-RAFSS-1.1 V-RAFSS-1.2 V-RAFSS-1.3	coastal California gnatcatcher San Bernardino kangaroo rat Los Angeles pocket mouse Santa Ana River woollystar slender-horned spineflower
V-RAFSS-CA8	Use approved mitigation/conservation banks and in-lieu fee programs to mitigate for RAFSS vegetation and associated Focal Species, as applicable and available within defined service areas.	V-RAFSS-1.3	Riversidean alluvial fan sage scrub RAFSS Focal Species
Transitional Scrub, Chaparral, and Woodland (TSCW)			
V-TSCW-CA1	Coordinate with existing land managers to identify and implement management activities within existing protected areas that would maintain and enhance habitat quality for Focal Species in TSCW vegetation communities beyond that which is provided by the existing management regime.	V-TSCW-1.1	Transitional scrub, chaparral and woodland TSCW Focal Species[21]
V-TSCW-CA2	Acquire, through fee title or conservation easement, unprotected lands occupied by Focal Species, focusing on identified TSCW conservation priority areas in the Valley subarea.	V-TSCW-1.2	Transitional scrub, chaparral and woodland TSCW Focal Species

[21] Blainville's horned lizard, Bell's sparrow, burrowing owl, coastal California gnatcatcher, white-tailed kite, western spadefoot, mountain lion

Table 3-18
Conservation Actions Summary for the Valley Subarea

Conservation Action ID	Conservation Action	Applicable Conservation Objective	Applicable Conservation Elements
V-TSCW -CA3	Create and restore TSCW habitat through the development and implementation of habitat restoration plans in suitable locations in conservation priority areas in the Valley subarea.	V-TSCW-1.1 V-TSCW-1.2	Transitional scrub, chaparral and woodland TSCW Focal Species
V-TSCW-CA4	Enhance habitat quality for Focal Species in TSCW habitat degraded by invasive plant species through the implementation invasive plant control actions.	V-TSCW-1.1 V-TSCW-1.2	Transitional scrub, chaparral and woodland TSCW Focal Species
V-TSCW-CA5	Enhance wildlife movement and habitat connectivity by implementing actions that improve wildlife access to and through TSCW areas, focusing on the identified conservation priority areas in the Valley subarea.	V-TSCW-1.1 V-TSCW -1.2	Valley Focal Species
V-TSCW-CA6	Within the Plan Area of the Wash Plan HCP, implement conservation and mitigation actions for TSCW Focal Species consistent with and complementary to the conservation strategy for the species covered by this HCP.	V-TSCW-1.1 V-TSCW-1.2	coastal California gnatcatcher
V-TSCW-CA7	Within the Plan Area of the Upper Santa Ana River HCP, implement conservation and mitigation actions for TSCW Focal Species consistent with and complementary to the conservation strategy for the species covered by this HCP.	V-TSCW-1.1 V-TSCW-1.2	western spadefoot burrowing owl coastal California gnatcatcher
V-TSCW-CA8	Use approved mitigation/conservation banks and in-lieu fee programs to mitigate for TSCW vegetation and associated Focal Species, as applicable and available within defined service areas.	V-TSCW-1.2	Transitional scrub, chaparral and woodland TSCW Focal Species
Developed and Agriculture (DA)			
V-DA-CA1	Coordinate with existing land managers and land owners of working lands to identify and implement management activities that would maintain and enhance habitat quality for Focal Species in agricultural areas and other developed areas.	V-DA-1.1	developed and agricultural areas DA Focal Species[22]
V-DA-CA2	Acquire easements or other agreements to maintain working lands in existing conditions in areas suitable for Focal Species, focusing on identified DA conservation priority areas in the Valley subarea.	V-DA-1.1	developed and agricultural areas DA Focal Species

[22] burrowing owl, tricolored blackbird, mountain lion

Table 3-19
Conservation Actions Summary for the West Desert Subarea

Conservation Action ID	Conservation Action	Applicable Conservation Objective	Applicable Conservation Elements
Desert Scrub (DS)			
WD-DS-CA1	Coordinate with existing land managers to identify and implement management activities within existing protected areas that would maintain and enhance habitat quality for Focal Species in desert scrub vegetation communities beyond that which is provided by the existing management regime.	WD-DS-1.1	Desert scrub DS Focal Species[23]
WD-DS-CA2	Acquire, through fee title or conservation easement, unprotected lands occupied by Focal Species, focusing on identified desert scrub conservation priority areas in the West Desert subarea.	WD-DS-1.2	Desert scrub DS Focal Species
WD-DS-CA3	Enhance habitat quality for Focal Species in desert scrub habitat degraded by invasive plant species (e.g., Sahara mustard) through the implementation invasive plant control actions.	WD-DS-1.1 WD-DS-1.2	Desert scrub DS Focal Species
WD-DS-CA4	Enhance wildlife movement and habitat connectivity by implementing actions that improve wildlife access across/around barriers to movement in the West Desert subarea	WD-DS-1.1 WD-DS-1.2	West Desert Focal Species
WD-DS-CA5	Within the Plan Area of the Desert Renewable Energy Conservation Plan Land Use Plan Amendment on BLM land, implement conservation and mitigation actions for Focal Species consistent with and complementary to this resource management plan.	WD-DS-1.1	Agassiz's desert tortoise burrowing owl golden eagle desert bighorn sheep Mohave ground squirrel pallid bat Townsend's big-eared bat alkali mariposa lily Barstow woolly sunflower Mojave monkeyflower Parish's daisy

[23] Agassiz's desert tortoise, burrowing owl, American badger, golden eagle, desert bighorn sheep, desert kit fox, Le Conte's thrasher, Mohave ground squirrelpallid bat, Townsend's big-eared bat, alkali mariposa-lily, Barstow woolly sunflower, Mojave monkeyflower, Lane Mountain milkvetch, Parish's daisy

Table 3-19
Conservation Actions Summary for the West Desert Subarea

Conservation Action ID	Conservation Action	Applicable Conservation Objective	Applicable Conservation Elements
WD-DS-CA6	Within the Plan Area of the Town of Apple Valley NCCP/HCP, implement conservation and mitigation actions for desert scrub Focal Species consistent with and complementary to the conservation strategy for the species covered by this HCP.	WD-DS-1.2	Agassiz's desert tortoise Blainville's horned lizard burrowing owl golden eagle LeConte's thrasher Mohave ground squirrel Mojave River vole Mohave tui chub Barstow woolly sunflower
WD-DS-CA7	Implement conservation and mitigation actions for federally-listed desert scrub Focal Species consistent with USFWS Recovery Plans or the most current guidance.	WD-DS-1.1 WD-DS-1.2	Agassiz's desert tortoise (Mojave population) Mohave tui chub
WD-DS-CA8	Implement conservation and mitigation actions for burrowing owl consistent with the Staff Report on Burrowing Owl Mitigation (CDFG 2012) or the most current guidance.	WD-DS-1.1 WD-DS-1.2	burrowing owl
WD-DS-CA9	In the Morongo Basin area, implement conservation and mitigation actions consistent with and complementary to the Morongo Basin Conservation Priorities Report	WD-DS-1.2	Desert scrub DS Focal Species
WD-DS-CA10	Use approved mitigation/conservation banks and in-lieu fee programs to mitigate for desert scrub vegetation and associated Focal Species, as applicable and available within defined service areas.	WD-DS-1.2	Desert scrub DS Focal Species
	Dune and Playa (DP)		
WD-DP-CA1	Coordinate with existing land managers to identify and implement management activities within existing protected areas that would maintain and enhance habitat quality for Focal Species in dune and playa vegetation communities beyond that which is provided by the existing management regime.	WD-DP-1.1	dune and playa DP Focal Species[24]

[24] Mohave fringe-toed lizard, pallid bat

Table 3-19
Conservation Actions Summary for the West Desert Subarea

Conservation Action ID	Conservation Action	Applicable Conservation Objective	Applicable Conservation Elements
WD-DP-CA2	Acquire, through fee title or conservation easement, unprotected lands occupied by Focal Species, focusing on identified dune and playa conservation priority areas in the West Desert subarea.	WD-DP-1.2	dune and playa DP Focal Species
WD-DP-CA3	Implement actions that maintain or restore the sand supply, transport, and/or deposition functions of the dune and playa systems of the West Desert subarea	WD-DP-1.1 WD-DP-1.2	dune and playa DP Focal Species
WD-DP-CA4	Within the Plan Area of the Desert Renewable Energy Conservation Plan Land Use Plan Amendment on BLM land, implement conservation and mitigation actions for Focal Species consistent with and complementary to this resource management plan.	WD-DP-1.1	Mohave fringe-toed lizard pallid bat
WD-DP-CA5	In the Morongo Basin area, implement conservation and mitigation actions consistent with and complementary to the Morongo Basin Conservation Priorities Report	WD-DS-1.2	dune and playa DP Focal Species
Grassland (GRS)			
WD-GRS-CA1	Coordinate with existing land managers to identify and implement management activities within existing protected areas that would maintain and enhance habitat quality for Focal Species in grassland vegetation communities beyond that which is provided by the existing management regime.	WD-GRS-1.1	native grasslands non-native grasslands Grassland Focal Species[25]
WD-GRS-CA2	Acquire, through fee title or conservation easement, unprotected lands occupied by Focal Species, focusing on identified grassland conservation priority areas in the West Desert subarea.	WD-GRS-1.2	native grasslands non-native grasslands Grassland Focal Species
WD-GRS-CA3	Enhance habitat quality for Focal Species in grassland habitat degraded by invasive plant species through the implementation invasive plant control actions.	WD-GRS-1.1 WD-GRS-1.2	native grasslands non-native grasslands Grassland Focal Species
WD-GRS-CA4	Implement conservation and mitigation actions for burrowing owl consistent with the Staff Report on Burrowing Owl Mitigation (CDFG 2012) or the most current guidance.	WD-GRS-1.1 WD-GRS-1.2	burrowing owl

[25] Blainville's horned lizard, burrowing owl, golden eagle, Swainson's hawk, American badger, pallid bat

Table 3-19
Conservation Actions Summary for the West Desert Subarea

Conservation Action ID	Conservation Action	Applicable Conservation Objective	Applicable Conservation Elements
WD-GRS-CA5	Within the Plan Area of the Desert Renewable Energy Conservation Plan Land Use Plan Amendment on BLM land, implement conservation and mitigation actions for Focal Species consistent with and complementary to this resource management plan.	WD-GRS-1.1	burrowing owl golden eagle Swainson's hawk pallid bat
WD-GRS-CA6	Within the Plan Area of the Town of Apple Valley NCCP/HCP, implement conservation and mitigation actions for grassland Focal Species consistent with and complementary to the conservation strategy for the species covered by this HCP.	WD-GRS-1.2	Blainville's horned lizard burrowing owl golden eagle
WD-GRS-CA7	In the Morongo Basin area, implement conservation and mitigation actions consistent with and complementary to the Morongo Basin Conservation Priorities Report	WD-GRS-1.2	native grasslands non-native grasslands Grassland Focal Species
WD-GRS-CA8	Use approved mitigation/conservation banks and in-lieu fee programs to mitigate for grassland vegetation and associated Focal Species, as applicable and available within defined service areas.	WD-GRS-1.2	native grasslands non-native grasslands Grassland Focal Species
Riparian and Wetland (RW)			
WD-RW-CA1	Coordinate with existing land managers to identify and implement management activities within existing protected areas that would maintain and enhance habitat quality for Focal Species in riparian and wetland vegetation communities beyond that which is provided by the existing management regime.	WD-RW-1.1 WD-RW-1.2	riparian wetlands and waters Riparian and Wetland Focal Species[26]
WD-RW-CA2	Acquire, through fee title or conservation easement, unprotected lands occupied by Focal Species, focusing on identified riparian and wetland conservation priority areas in the West Desert subarea.	WD-RW-1.3	riparian wetlands and waters Riparian and Wetland Focal Species

[26] arroyo toad, western pond turtle, golden eagle, least Bell's vireo, southwestern willow flycatcher, Swainson's hawk, tricolored blackbird, yellow-billed cuckoo Mojave river vole, Mohave tui chub, pallid bat, Townsend's big-eared bat, Victorville shoulderband, alkali mariposa-lily, San Bernardino aster

Table 3-19
Conservation Actions Summary for the West Desert Subarea

Conservation Action ID	Conservation Action	Applicable Conservation Objective	Applicable Conservation Elements
WD-RW-CA3	Create and restore riparian and wetland habitat through the development and implementation of habitat restoration plans in suitable locations in conservation priority areas in the West Desert subarea.	WD-RW-1.1 WD-RW-1.2 WD-RW-1.3	riparian wetlands and waters Riparian and Wetland Focal Species
WD-RW-CA4	Enhance habitat quality for Focal Species in riparian and wetland habitat degraded by invasive plant species (e.g., Arundo, tamarisk) through the implementation invasive plant control actions.	WD-RW-1.1 WD-RW-1.2 WD-RW-1.3	riparian wetlands and waters Riparian and Wetland Focal Species
WD-RW-CA5	Enhance habitat quality for Focal Species in riparian and wetland habitat degraded by invasive aquatic species (e.g., bullfrog, cowbird) through the implementation invasive animal control actions.	WD-RW-1.1 WD-RW-1.2 WD-RW-1.3	riparian wetlands and waters Riparian and Wetland Focal Species
WD-RW-CA6	Enhance wildlife movement and habitat connectivity by implementing actions that improve wildlife access to and through riparian and wetland areas in the West Desert subarea	WD-RW-1.1 WD-RW-1.2 WD-RW-1.3	West Desert Focal Species
WD-RW-CA7	Within the Plan Area of the Desert Renewable Energy Conservation Plan Land Use Plan Amendment on BLM land, implement conservation and mitigation actions for Focal Species consistent with and complementary to this resource management plan.	WD-RW-1.1	arroyo toad golden eagle least Bell's vireo southwestern willow flycatcher Swainson's hawk tricolored blackbird yellow-billed cuckoo Mohave tui chub pallid bat Townsend's big-eared bat alkali mariposa lily
WD-RW-CA8	Within the Plan Area of the Town of Apple Valley NCCP/HCP, implement conservation and mitigation actions for riparian and wetland Focal Species consistent with and complementary to the conservation strategy for the species covered by this HCP.	WD-RW-1.3	golden eagle least Bell's vireo Mojave river vole

Table 3-19
Conservation Actions Summary for the West Desert Subarea

Conservation Action ID	Conservation Action	Applicable Conservation Objective	Applicable Conservation Elements
WD-RW-CA9	In the Morongo Basin area, implement conservation and mitigation actions consistent with and complementary to the Morongo Basin Conservation Priorities Report	WD-RW-1.3	riparian wetlands and waters Riparian and Wetland Focal Species
WD-RW-CA10	Implement conservation and mitigation actions for federally-listed Riparian and Wetland Focal Species consistent with USFWS Recovery Plans or the most current guidance.	WD-RW-1.1 WD-RW-1.2 WD-RW-1.3	arroyo toad least Bell's vireo southwestern willow flycatcher Mohave tui chub Parish's daisy
WD-RW-CA11	Use approved mitigation/conservation banks and in-lieu fee programs to mitigate for riparian and wetland vegetation and associated Focal Species, as applicable and available within defined service areas.	WD-RW-1.3	riparian wetlands and waters Riparian and Wetland Focal Species
Transitional Scrub, Chaparral, and Woodland (TSCW)			
WD-TSCW-CA1	Coordinate with existing land managers to identify and implement management activities within existing protected areas that would maintain and enhance habitat quality for Focal Species in TSCW vegetation communities beyond that which is provided by the existing management regime.	WD-TSCW-1.1	Transitional scrub, chaparral and woodland TSCW Focal Species[27]
WD-TSCW-CA2	Acquire, through fee title or conservation easement, unprotected lands occupied by Focal Species, focusing on identified TSCW conservation priority areas in the West Desert subarea.	WD-TSCW-1.2	Transitional scrub, chaparral and woodland TSCW Focal Species
WD-TSCW-CA3	Create and restore TSCW habitat through the development and implementation of habitat restoration plans in suitable locations in conservation priority areas in the West Desert subarea.	WD-TSCW-1.1 WD-TSCW-1.2	Transitional scrub, chaparral and woodland TSCW Focal Species

[27] Blainville's horned lizard, burrowing owl, golden eagle, Swainson's hawk, desert bighorn sheep, American badger, pallid bat, Joshua tree, Le Conte's thrasher, Mojave monkeyflower, Parish's daisy, Short-joint beavertail, Lane Mountain milkvetch

Table 3-19
Conservation Actions Summary for the West Desert Subarea

Conservation Action ID	Conservation Action	Applicable Conservation Objective	Applicable Conservation Elements
WD-TSCW-CA4	Enhance habitat quality for Focal Species in TSCW habitat degraded by invasive plant species through the implementation invasive plant control actions.	WD-TSCW-1.1 WD-TSCW-1.2	Transitional scrub, chaparral and woodland TSCW Focal Species
WD-TSCW-CA5	Within the Plan Area of the Desert Renewable Energy Conservation Plan Land Use Plan Amendment on BLM land, implement conservation and mitigation actions for Focal Species consistent with and complementary to this resource management plan.	WD-TSCW-1.1	burrowing owl golden eagle Swainson's hawk desert bighorn sheep pallid bat Mojave monkeyflower Parish's daisy
WD-TSCW-CA6	Within the Plan Area of the Town of Apple Valley NCCP/HCP, implement conservation and mitigation actions for TSCW Focal Species consistent with and complementary to the conservation strategy for the species covered by this HCP.	WD-TSCW-1.2	Blainville's horned lizard golden eagle LeConte's thrasher Mojave monkeyflower
WD-TSCW-CA7	In the Morongo Basin area, implement conservation and mitigation actions consistent with and complementary to the Morongo Basin Conservation Priorities Report.	WD-TSCW-1.2	Transitional scrub, chaparral and woodland TSCW Focal Species
Developed and Agriculture (DA)			
WD-DA-CA1	Coordinate with existing land managers and land owners of working lands to identify and implement management activities that would maintain and enhance habitat quality for Focal Species in agricultural areas and other developed areas.	WD-DA-1.1	developed and agricultural areas DA Focal Species[28]
WD-DA-CA2	Acquire easements or other agreements to maintain working lands in existing conditions in areas suitable for Focal Species, focusing on identified DA conservation priority areas in the West Desert subarea.	WD-DA-1.1	developed and agricultural areas DA Focal Species

[28] burrowing owl, Swainson's hawk, tricolored blackbird, pallid bat

3.4.2 Guidelines for Prioritizing Actions

Section 3.4.1, and associated Table 3-18 and Table 3-19, provide the SBC RCIS conservation action toolbox for the Valley and West Desert subareas. The SBC RCIS conservation action toolbox is a valuable synthesis of the suite of actions available for the conservation and mitigation that would contribute towards achieving regional conservation objectives for the Focal Species. The following guidelines for prioritizing conservation/mitigation actions was developed to provide decision support when multiple potential actions or geographic locations may fulfill a conservation/mitigation need.

Numerous considerations must be evaluated by landowners, project proponents, and decision makers when planning conservation and mitigation actions. Actions implemented to fulfill individual conservation/mitigation needs should also, to the extent possible, contribute towards achieving the SBC RCIS conservation goals and objectives. To this end, a set of ecologically based factors was identified to provide decision support for conservation and mitigation action prioritization. All else being equal, actions that contribute towards the conservation of multiple conservation elements and prioritization factors would contribute greatest to the conservation strategy for the region and would be considered priority.

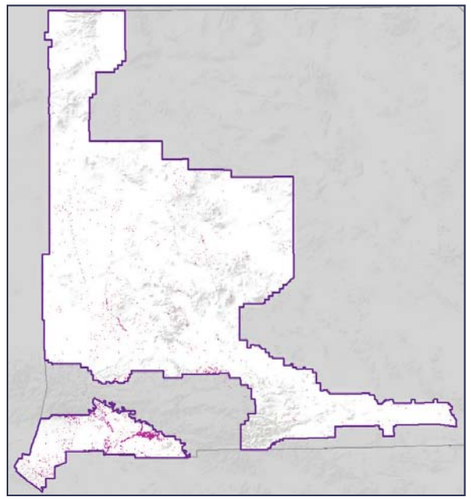
Table 3-20 provides a summary of ten factors to consider when prioritizing potential conservation/mitigation actions. Factors to consider when prioritizing actions include Focal Species occurrence records, Focal Species habitat areas, USFWS-designated critical habitat for Focal Species, vegetation communities, habitat linkages, hydrologic features, land facets, CDFW ACE-II indices, terrestrial intactness, and existing priorities in the Morongo Basin. Figure 3-5 illustrates, at a regional scale, how these factors are distributed spatially based on best available spatial datasets.

Figure 3-6 provides an aggregated, regional-scale map of how the conservation prioritization factors overlap in the SBC RCIS area. This map does not represent a reserve design or influence where conservation, mitigation, or development should or should not occur. Figure 3-6 is intended only to provide regional information on the spatial distribution of factors to consider when making conservation and mitigation decisions in the Valley and West Desert subareas of the SBC RCIS. Conservation/mitigation and land use decisions depend on a variety of considerations that are unique to each situation, and Figure 3-6 provides regional-scale conservation planning guidance for those decisions.

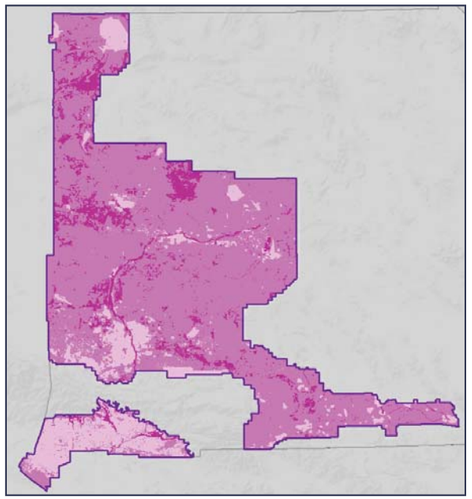
Table 3-20
Conservation Prioritization Factors

Conservation Element	Prioritization Factor	Description
Focal Species	• Occurrence Localities • Habitat Areas • Focal Species Richness • USFWS-Designated Critical Habitat	Locations where Focal Species have been recorded is a prioritization consideration; however, occurrence records have inherent limitations. Habitat areas provide a reasonable approximation of the potentially suitable habitat areas for Focal Species. Occupied areas and areas where habitat for multiple Focal Species overlap would be a conservation priority. For use in prioritization, non-duplicate occurrence records from 1990 or later for Focal Species were selected with a 400-foot-buffer. For Focal Species habitat areas, 0-3 overlapping Focal Species habitats was considered Low richness; 4-7 overlapping Focal Species habitats was considered Moderate richness; 8 or more overlapping Focal Species habitats was considered High richness; Moderate and High richness areas were selected for prioritization. Critical habitat designations for Focal Species is a consideration for prioritization and Focal Species with these designations include: California red-legged frog, arroyo toad, Agassiz's desert tortoise, coastal California gnatcatcher, least Bell's vireo, southwestern willow flycatcher, western yellow-billed cuckoo, San Bernardino kangaroo rat, Santa Ana sucker, Lane Mountain milkvetch, and Parish's daisy.
Vegetation Communities	• San Bernardino County Vegetation Communities	Areas with native and naturalized vegetation communities would be a conservation priority, especially where the community supports Focal Species or overlaps with other prioritization factors. For use in prioritization, the general vegetation communities were aggregated into 7 Habitat Groups. Class 1 Habitat Groups include: Riparian and Wetland, Riversidean Alluvial Fan Sage Scrub, and Dune and Playa; Class 2 Habitat Groups include: Desert Scrub, Grassland, and Transitional Scrub, Chaparral, and Woodland; Class 3 includes Agriculture. Prioritized types include Class 1 and Class 2.
Landscape Processes and Features	• Habitat Linkages • Hydrologic Features • Land Facets / Gradients • CDFW ACE-II • Terrestrial Intactness • Morongo Basin Priorities	Areas of modeled habitat linkages would be a conservation priority. Areas that support hydrological features would be prioritized, including major rivers, lakes, and seeps/springs (buffered 100 feet). Areas that provide elevational gradients can allow for Focal Species climate adaption and provide climate refugia; prioritized land facets included canyons, deeply incised streams; mountain tops, high ridges; open slopes. Areas with high Biological Index scores in CDFW ACE-II would be a conservation priority, to the extent those areas are intact and overlapping with other factors. For use in prioritization, the ACE-II ecoregional bio rank was used, which is a composite index of native species richness, rare species richness, "irreplaceability" (i.e., rarity-weighted richness), and the presence of sensitive habitats; values of 4 and 5 were prioritized. Terrestrial intactness derived from the USGS human footprint dataset that includes 10 footprint classes. Human footprint values of 1-4 were considered areas of High Intactness, values of 5-8 were considered areas of Moderate Intactness, values of 9-10 were considered areas of Low Intactness; high intactness areas are priority. The Morongo Basin Conservation Priorities Composite Rank or High Priority and Moderate-High Priority were included as priority.

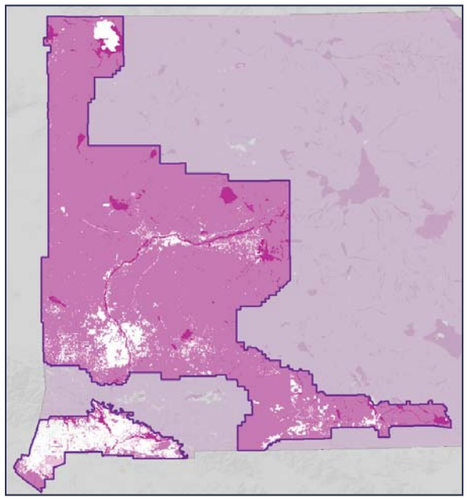
Notes: Focal Species occurrence localities, Focal Species habitat areas, and San Bernardino County vegetation communities mapping based on the datasets described in Appendix B. Critical habitat based on USFWS 2017a. Hydrologic features based on the National Hydrography dataset (USGS 2017). Land facets derived from a digital elevation model (USGS 2007) as in Beier and Brost (2010). CDFW ACE-II dataset provide through the BIOS service. Terrestrial intactness derived from USGS Human Footprint dataset (Leu et al. 2008). Morongo Basin priorities based on data from Sonoran Institute and Morongo Basin Open Space Group (2012).



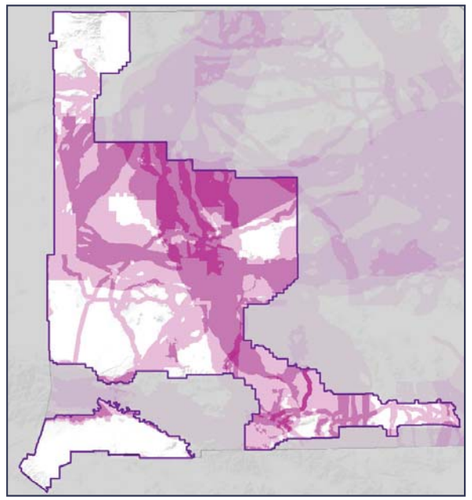
Occurrence Localities



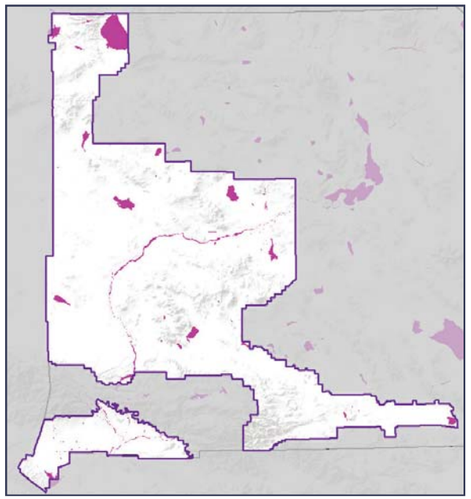
Focal Species Habitat Areas



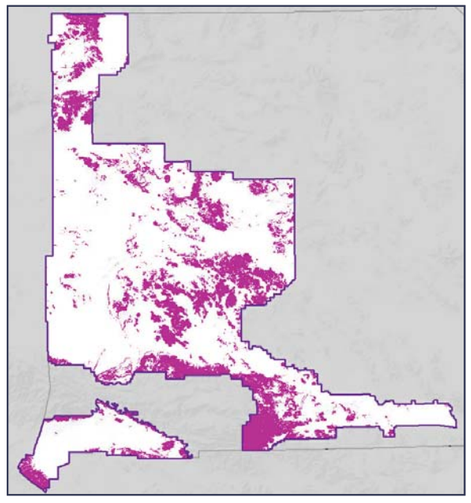
Vegetation Communities



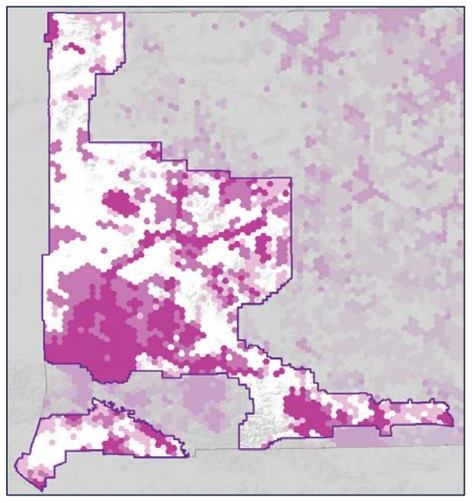
Habitat Linkages



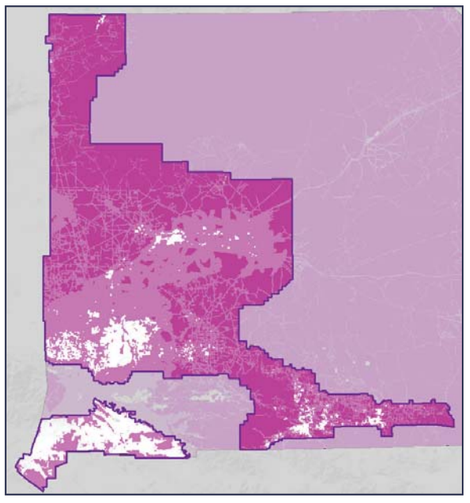
Hydrological Features



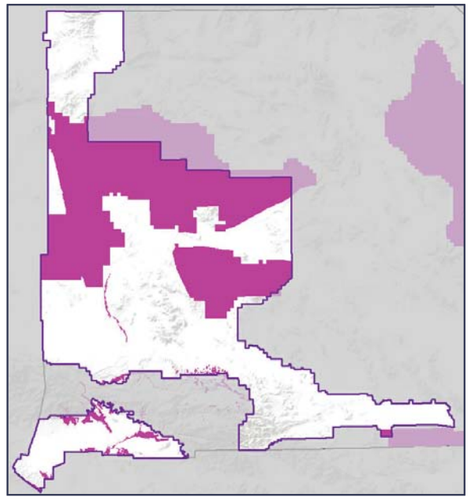
Land Facets



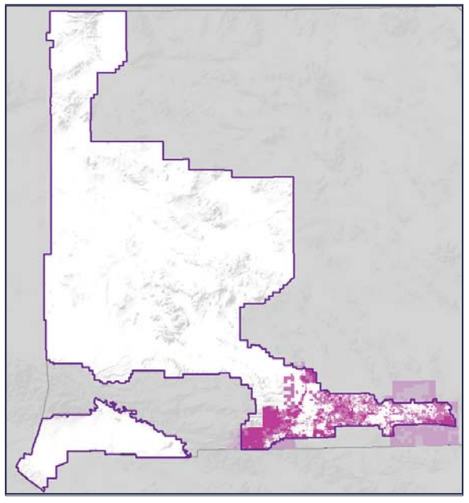
ACE-II Ecoregional Bio Rank



Landscape Intactness



USFWS Critical Habitat



Morongo Basin Priorities

SOURCE: Dudek 2018

FIGURE 3-5

Conservation Prioritization Factors

San Bernardino County Regional Conservation Investment Strategy

DUDEK

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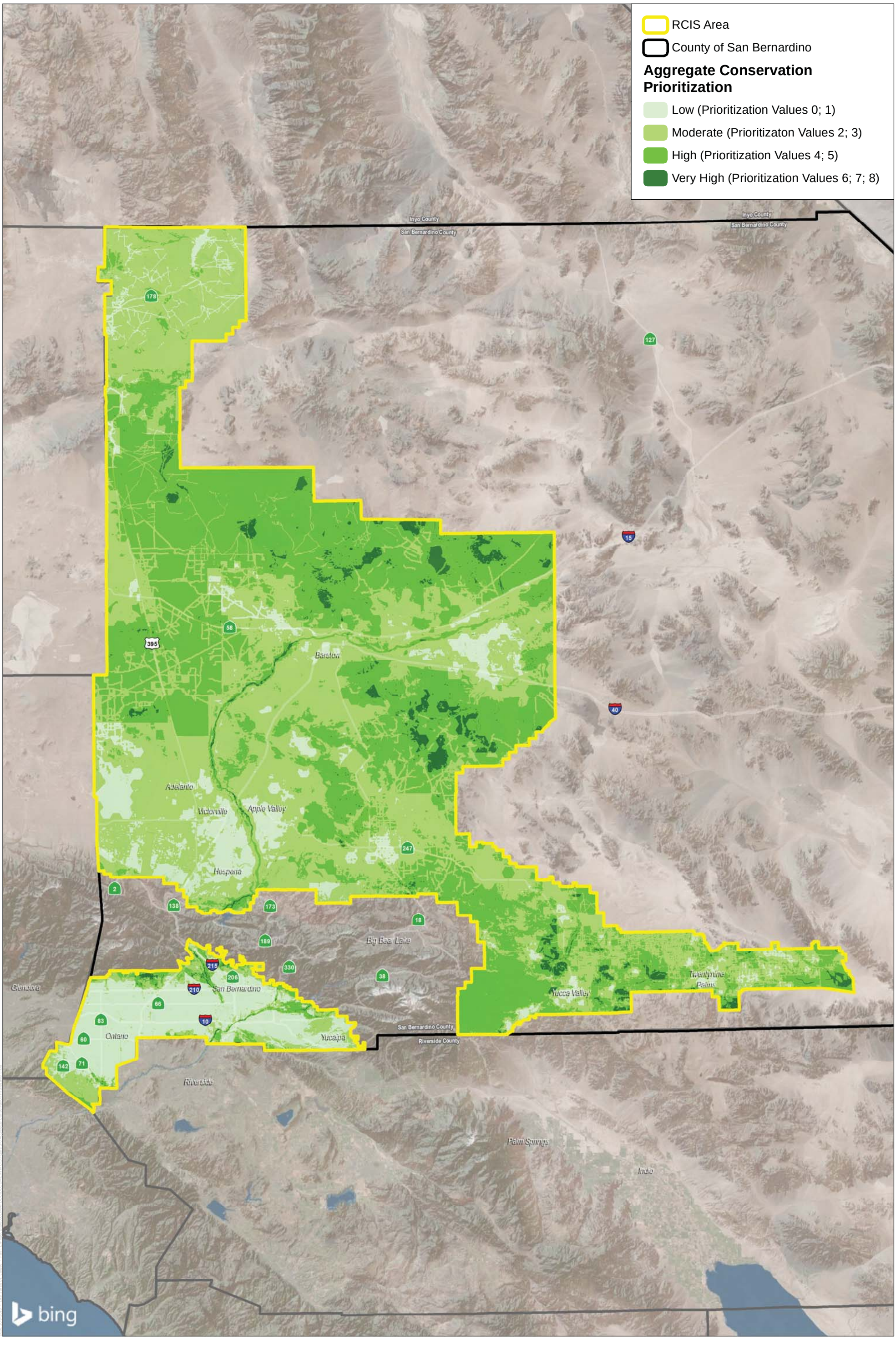

SOURCE: Bing Maps 2018; San Bernardino County 2018

FIGURE 3-6

Aggregate Conservation Prioritization

San Bernardino County RCIS

DUDEK

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4 IMPLEMENTATION FRAMEWORK

Following CDFW approval of the SBC RCIS, it will be available for use by public agencies, the development community, environmental groups, other interested entities, and the public to inform the implementation of conservation and mitigation actions in the Valley and West Desert regions of San Bernardino County.

The SBC RCIS is nonregulatory and voluntary. The SBC RCIS would be implemented by entities that execute conservation/mitigation actions consistent with the conservation and mitigation actions (see Section 3.4) that contribute towards achieving the conservation goals and objectives for Focal Species (see Section 3.3). The SBC RCIS itself does not require implementation or funding to support implementation; however, progress towards achieving the objectives of this RCIS would be facilitated through establishing an implementation framework.

The County and SBCOG, in collaboration with SCAG, will serve as the SBC RCIS coordination team. The SBC RCIS coordination team will serve as the primary points of contact for the RCIS following approval. The coordination team will be available to support CDFW and RCIS users with documentation, mapping, and other data products during the implementation period. The coordination team will play an important roll as champion of the SBC RCIS and promote its use through communications, outreach, and partnerships in the region. The SBC RCIS implementation team would also be involved in the adaptive management and monitoring strategy, mitigation credit agreement development (if pursued) and RCIS updates, extensions, and amendments, as described below.

Adaptive Management and Monitoring Strategy

Adaptive management involves using the results of new information gathered through a monitoring program to adjust management strategies and practices to help provide for the conservation of Focal Species and their habitats. A monitoring strategy is the periodic evaluation of monitoring results to assess the adequacy of implementing a conservation action or habitat enhancement action and to provide information to direct adaptive management activities to determine the status of the Focal Species, their habitats, or other natural resources. Following approval of the SBC RCIS, the SBC RCIS coordination team would work with RCIS users, local municipalities and agencies, and stakeholders to implement a coordinated adaptive management and monitoring strategy based on established guidelines (e.g., Williams and Brown 2012; Williams et al. 2009; Atkinson et al. 2004) that informs RCIS implementation over time. If mitigation credit agreements (see below) are developed under the SBC RCIS, specific adaptive management and monitoring activities would be required during implementation.

Mitigation Credit Agreement Development

Mitigation credit agreements (MCAs) may be developed by any public or private entity within an approved RCIS area that identifies the types and numbers of credits proposed to be created by implementing one or more conservation actions. MCA developers must independently fund and obtain CDFW approval of the MCA. Members of SBC RCIS coordination team may sponsor their own MCA development and coordinate the development of MCAs by others.

RCIS Updates

RCIS updates involve incorporating newly available scientific information and data into an RCIS to keep the document current. Ongoing RCIS updates would generally be small in nature, resulting is targeted updates to document narrative, tabular information, and/or maps. An RCIS proponent may update an approved RCIS at any time, in coordination with CDFW. A thorough RCIS update would be necessary to support an RCIS extension.

RCIS Extensions

An approved RCIS may be extended every 10 years. CDFW would consider a 10-year RCIS extension following the submittal of a thorough RCIS update.

RCIS Amendments

Two types of RCIS Amendments have been identified: simple and complex. Simple RCIS amendments involve small or minor changes to an RCIS document that do not result in substantial changes to the RCIS. Complex amendments involve substantial RCIS changes such as boundary revisions or Focal Species additions. RCIS amendments may be proposed by the original RCIS proponents, CDFW, or third party entities with the written support of the original proponents. RCIS amendments must be submitted to CDFW for approval.

5 LIST OF PREPARERS AND REVIEWERS

The SBC RCIS is the product of a collaborative, multiyear effort involving numerous agencies, stakeholders from range of interests, and individuals of the public. Key contributors to the preparation of the RCIS are listed below.

San Bernardino County Transportation Authority

- Josh Lee, Chief of Planning, RCIS Project Manager
- Steven Smith, Director of Planning

County of San Bernardino

- Terri Rahhal, Land Use Services Director
- Tom Hudson, Land Use Services Director (previous)

Southern California Association of Governments

- India Brookover, Regional Planner

Environment Element Group

- Dan Silver, Endangered Habitats League (co-chair)
- Ali Sahabi, Building Industry Association (co-chair)

Dudek

- Mike Howard, Project Manager and Lead Conservation Biologist

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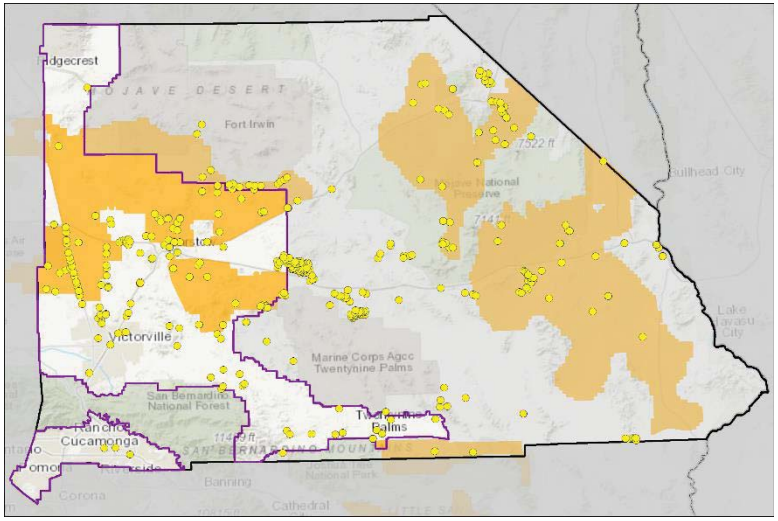
APPENDIX A

Focal Species Summaries

Agassiz's Desert Tortoise (*Gopherus agassizii*)

Legal Status

State: Threatened
Federal: Threatened
Critical Habitat: Designated on February 8, 1994[1] (orange areas on inset map)
Recovery Plan: Issued by the USFWS on May 6, 2011[2]



Distribution: The Agassiz's desert tortoise inhabits the Mojave, Sonoran, and Colorado deserts in the southwestern United States and near Mexico. The Colorado River has served as a geographic barrier isolating the Mojave (to the north and west of the river) and the Sonoran populations (to the south and east of the river) for millions of years.[3] The Mojave population occurs north and west of the Colorado River in Arizona, Utah, Nevada, and California. Within California this species resides south of the San Joaquin Valley, eastward in the Mojave and Colorado Deserts.[2] This species occurs from below sea level to 2,225 meters (7,300 feet) in elevation.[2]

RCIS Distribution: A total of 145 occurrences are distributed throughout the West Desert subarea, including the Recovery Plan-designated tortoise conservation areas (Ord-Rodman, Superior-Cronese, and Fremont Kramer) and habitat linkages between them (i.e., Fremont Kramer to Ord-Rodman linkage and Ord-Rodman to Joshua Tree National Park linkage) (see map inset).[2,4]

Seasonal Periods for Agassiz's Desert Tortoise[10]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding				✓	✓			✓	✓	✓	✓	
Nesting					✓	✓	✓					
Hibernation	✓	✓	✓								✓	✓

Habitat Requirements: This species spends up to 98% of their time underground[5] and require soils friable enough for digging but firm enough to carve burrows that will not collapse.[2] This species utilizes a variety of habitats including flats dominated by creosote brush (*Larrea tridentate*) scrub, white bursage (*Ambrosia dumosa*), and saltbush scrub (*Atriplex* spp.)[6] at lower elevations, to rocky slopes in blackbrush (*Coleogyne* spp.) scrub and juniper woodland transition zones at higher elevations.[2,7,8] This species uses shrubs for shade during hot weather.[9]

Foraging: This species is an herbivore and forages on winter plants (annuals and non-natives), perennial grasses, woody perennials, and cacti.[7]

Reproduction: Agassiz's desert tortoises spend most of their lives in burrows and emerge in late winter or early spring. Mating occurs during the spring and fall with nests produced during the summer.[10] Nests are located in natural burrows, artificial burrows, and under vegetation. Clutch sizes range from 2 to 7 eggs and young hatch in the summer.[10] Individuals require 13–20 years to reach sexual maturity and experiences low reproductive rates during a long period of reproduction protential.[2]

Pressures and Stressors: Population pressures and stressors include habitat loss, degradation, and fragmentation from urbanization, agricultural developments, livestock grazing, disease, predation, collecting, invasive exotic plants, energy and mineral development, and off-road vehicles.[7] Habitat loss and fragmentation are considered the primary pressure to this species. Development reduces the amount of suitable habitat available in the region as well as introduces species that may injure or kill tortoises, such as unconfined pets.[7] Recovery of the species is particularly difficult because of the long reproductive time requirements for this species to reach sexual maturity and high mortality rates early in life.

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3 54 FR 42270–42278. Proposed rule: "Endangered and Threatened Wildlife and Plants; Desert Tortoise." October 13, 1989.
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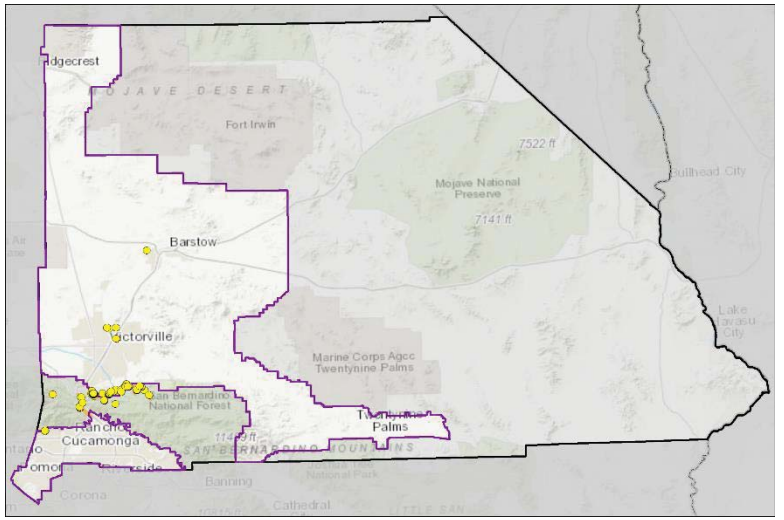
Legal Status

State: CDFW Species of Special Concern
Federal: Endangered
Critical Habitat: Originally designated on April 13, 2005;[1] USFWS issued revised critical habitat on February 9, 2011[2]
Recovery Plan: Issued by the USFWS on July 24, 1999[3]



Distribution: The arroyo toad historically occurred along the California coast from Monterey County south to Baja California. In addition, this species was previously recorded in the desert slopes of Los Angeles, Riverside, San Bernardino, and San Diego Counties.[4] This species current range is considerably smaller than historically recorded and extends from the southern portion of the Coast Ranges from San Luis Obispo County to Baja California and up to elevations of 1,950 meters (6,400 feet).[4]

RCIS Distribution: In the West Desert, the species is currently known from 58 occurrence records in Little Horsethief Creek and the West Fork Mojave River, in the foothills south of Hesperia in the Summit Valley and Telephone Canyon area (see inset map).[5,6] The species is no longer considered to occur on the Mojave River north (downstream) of the Mojave Forks dam.[6]

Habitat Requirements: This species requires shallow, slow-moving stream and riparian habitat, usually with extensive braided channels and sediment deposits.[7,8] Arroyo toads may occasionally use and disperse across upland sites[7] and burrows in sandy terraces.[9]

Breeding: Suitable breeding habitat consists of stream channels or shallow ponds with clear water.[3,4,7] Streams must flow for at least 4 to 5 months for successful reproduction and recruitment.[7,8] Breeding sites are typically located adjacent to sandy terraces.[9]

Foraging: This species consumes nocturnally active ant species,[7] snails, crickets, beetles, caterpillars, moths, and occasionally newly metamorphosed individuals.[4]

Seasonal Periods for Arroyo Toad[4,10]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding*			✓	✓	✓	✓	✓					
Metamorphosis						✓	✓					
Aestivation**	✓	✓						✓	✓	✓	✓	✓

*Breeding depends on water temperature and may occur as early as January in coastal southern California.[3] ** Little data exists to accurately characterize overwintering activities/habitat use.[3]

Reproduction: Adults are generally active from March to July.[4,10] Clutches of 2,000 to 10,000 eggs[3] are deposited in shallow margins of pools with little current and vegetation adjacent.[9] Eggs hatch in 4 to 6 days and larvae may take up to 14 days to become free swimming.[3,11] Young typically complete metamorphosis between 72 to 80 days[11,12] (around June to July[7]) and remain on the bordering gravel bars until the pool dries up (approximately 3 to 8 weeks, depending on local conditions).[9,11]

Pressures and Stressors: Primary population pressures and stressors to this species include habitat loss and alteration from changes in hydrology due to dams and reservoir construction, roads, agriculture, urbanization, flood control, water diversion, recreational activity, mining, and livestock grazing.[13] Additional pressures including the introduction of non-native invasive plant species (e.g., giant reed (*Arundo donax*) and tamarisk (*Tamarix* sp.)), which invade riparian habitats and alter the hydrology of stream drainages.[13] Predation by non-native aquatic species have also reduced extant populations of arroyo toad. Predatory fish prey on arroyo toad tadpoles, while bullfrogs (*Lithobates catesbeianus*) and African clawed frogs (*Xenopus laevis*) prey on all arroyo toad life stages. Diseases, such as chytrid fungus (*Batrachochytrium* sp.), have been linked to amphibian declines world-wide and may also be a population pressure on this species.[13] Wildfires may also adversely affect arroyo toads by direct mortality, destroying upland habitat adjacent to streambeds and removing vegetation that sustain watersheds.[13]

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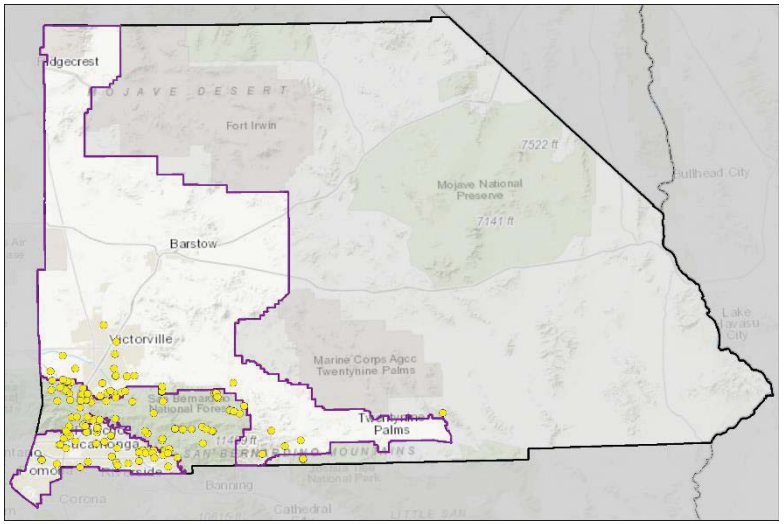
Blainville's Horned Lizard (*Phrynosoma blainvillii*)

Legal Status

State: CDFW Species of Special Concern
Federal: BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The Blainville's (Coast) horned lizard occurs from northern Baja California, along the coast of California and into the Central Valley, and eastward to the Sierra Nevada foothills and the western edge of the Mojave Desert.[1,2] This species inhabits elevations from sea level to 6,000 feet.[3]

RCIS Distribution: A total of 38 occurrences are distributed in remaining habitat areas throughout the Valley subarea (see inset map).[4] In the West Desert subarea, a total of 27 occurrences are distributed in the foothill habitats of the San Gabriel and San Bernardino Mountains (see inset map);[4] the more common desert horned lizard (*Phrynosoma platyrhinos calidiarum*) occurs elsewhere throughout the desert.

Habitat Requirements: This species is found year-round in a wide range of habitats including sage scrub, dunes, alluvial scrub, annual grasslands, chaparral, oak woodlands, riparian woodlands, Joshua tree woodland, coniferous forests, and saltbush scrub.[1]

Microhabitat: This species requires loose, fine soils for burrowing, open areas for thermoregulation, and shrubs for cover.[1] This species is often found along sandy washes and along dirt roads.[5]

Foraging: Ants, especially harvester ants, may make up 90% of this species diet. However, this species also consumes other small invertebrates such as spiders, termites, flies, honeybees, grasshoppers, beetles, and larvae.[1,5]

Seasonal Periods for Blainville's Horned Lizard[1]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding			✓	✓	✓	✓	✓*					
Adult Hibernation	✓	✓	✓					✓	✓	✓	✓	✓

* Early July

Reproduction: Adults are reproductively active from March to early July with ovipositing usually occurring between April to early July.[1,6,7] Typical clutch sizes are around 11 to 12 eggs,[1] but may range from 6 to 49 eggs.[7] Adults enter hibernation in late August to early September and emerge from hibernation near the end of March.[6]

Pressures and Stressors: Primary population pressures and stressors in this species includes habitat loss and conversion from urbanization, agriculture, and energy development.[1] In addition, off-highway vehicles and flood control structure contribute to mortality in this species. For example, Blainville's horned lizards may become trapped in erosion control blankets or directly crushed from off-road vehicles.[1] The introduction of non-native Argentine ants (*Linepithema humile*) have also displaced this species native ant prey populations, and studies suggest that Blainville's horned lizards do not commonly include Argentine ants in their diet.[1,8]

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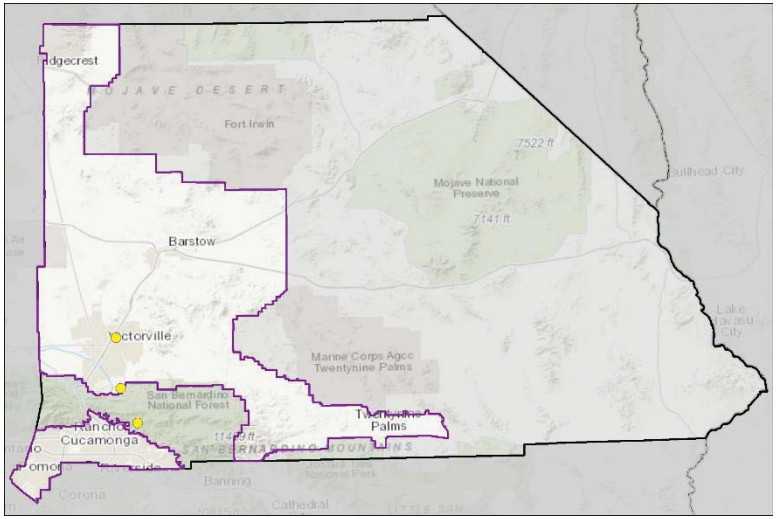
California Red-Legged Frog (*Rana draytonii*)

Legal Status

State: CDFW Species of Special Concern
Federal: Threatened
Critical Habitat: Originally designated on April 13, 2006[1]; USFWS issued revised critical habitat on March 17, 2010[2]
Recovery Plan: Issued by the USFWS on May 28, 2002[3]



Distribution: The California red-legged frog is found primarily in wetlands, streams, pools, marshes, and ponds in coastal drainages of central California. This species is distributed from Marin County to Ventura County and occurs in portions of the Sierra Nevada and Cascade ranges, typically below 1,200 meters (3,936 feet) in elevation.[4] Historically, this species range extended further north than its current range into Mendocino County[5].

RCIS Distribution: No occurrences for this species have been recorded in the Valley subarea (see inset map).[6] California red-legged frog is currently considered extirpated from the County; however, this area is part of Southern California Recovery Unit for the species.[3]

Seasonal Periods for California Red-Legged Frog[7,8,9]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding*	✓	✓	✓	✓							✓	✓
Dispersal/Aestivation*					✓	✓	✓	✓	✓	✓		

* Timing and seasonal activity varies locally with climate and conditions.[12]

Habitat Requirements: California red-legged frog requires specific aquatic and riparian habitat components including dense emergent riparian vegetation (e.g., willows (*Salix* sp.), cattails (*Typha* sp.)) associated with deep (more than 0.7 meters), still, or slow-moving water.[7,10,11] Adjacent vegetated terrestrial areas may provide habitat and cover during the winter.[7] This species aestivate in small mammal burrows, moist leaf litter, or potentially any cover that provides moisture (e.g., narrow incised stream channels, logs, boulders/rocks, agricultural equipment, abandoned structures).[7]

Breeding: Suitable breeding habitat includes dense emergent riparian vegetation associated with deep still or slow moving water.[7,10,11]

Foraging: This species has a variable diet. Larvae likely consume algae,[12] smaller adults consume invertebrates, and larger frogs may also consume small vertebrates (e.g., Pacific tree frog (*Pseudacris regilla*) and mice).[6,13]

Reproduction: This species breeds from November through April with earlier breeding occurring in southern populations.[4,5,8] This species is a prolific breeder and will lay eggs shortly after strong rainfall in the late winter and early spring.[14] Females deposit egg clusters (usually containing 2,000–5,000 eggs per moderate sized cluster 0.08–0.11 inches in diameter[7,12]) on emergent vertical vegetation (e.g., bulrush, cattail) and egg masses float on the surface of the water.[14] Eggs hatch 6 to 14 days after laying,[10,12] and larvae undergo metamorphosis 3.5 to 7 months after hatching.[8,15,16] It is estimated that less than 1% of eggs laid reach metamorphosis.[12]

Pressures and Stressors: Population pressures and stressors for this species include degradation and loss of habitat due to agriculture, urbanization, mining, overgrazing, recreation, timber harvesting, introduction of non-native plants, impoundments, water diversions, degradation of water quality, pesticides, recreation and off-road vehicles, and introduced predators (e.g., bullfrogs (*Lithobates catesbeianus*)).[3] However, the primary stressors on this species include habitat loss and alteration with over 90% of historical wetlands either diked, drained, or converted to agriculture or urban development.[5,17,18]

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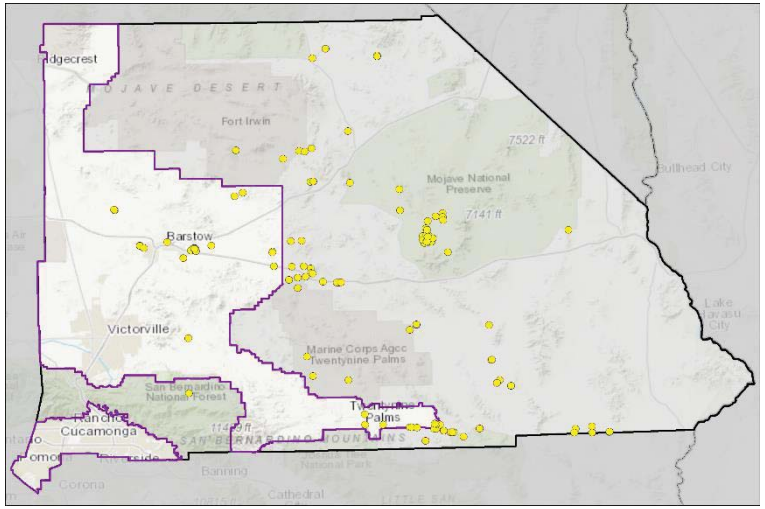
Mojave Fringe-Toed Lizard (*Uma scoparia*)

Legal Status

State: CDFW Species of Special Concern
Federal: BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The Mojave fringe-toed lizard is endemic to the Mojave and Sonoran deserts of Southern California and western Arizona.[1,2] It is restricted to aeolian sand habitats within the deserts of Los Angeles, Riverside, Inyo, and San Bernardino counties, California, as well as in a small areas of Yuma and La Paz counties, Arizona.[1,2,3] The majority of occurrences are associated with present-day and historical drainages associated with sand dune complexes of the Mojave and Amargosa rivers.[3] This species elevation range extends from sea level up to 3,000 feet.[2,4]

RCIS Distribution: A total of 23 occurrences are have been recorded in the West Desert subarea in the vicinity of Harper Dry Lake, Coyote Dry Lake, and the Mojave River (see inset map).[5]

Seasonal Periods for Mojave Fringe-Toed Lizard[1,4]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding				✓	✓	✓	✓					
Hibernation	✓	✓									✓	✓

Habitat Requirements: Mojave fringe-toed lizards require habitats consisting of fine, windblown sands associated with dunes, washes, riverbanks, hillsides, sandy hummocks, and the margins of dry lakes.[1,3,6,7] These areas generally occur within creosote bush scrub, although typically sparsely vegetated.[1,2,3,8] This species burrows up to approximately 2 inches into the sand and utilizes rodent burrows for cover from predators and thermoregulation, and may burrow up to 12 inches deep to hibernate.[4]

Foraging: This species is primarily insectivorous commonly consuming ants, beetles, grasshoppers, sand-dwelling cockroaches, hemipterans, spiders, antlion larvae, and caterpillars.[4] This species also forages upon the flower buds, stems, leaves, and seeds of plants, particularly as adults.[4,6]

Reproduction: Adults exhibit breeding colors from April to July.[1] Eggs are likely buried within the sand and are present from mid-May to mid-July.[4,8] Clutch size ranges from 2 to 5 eggs.[1,4] Sexual maturity is reached when individuals grow to 65 to 70 millimeters, two summers after hatching.[1] Reproductive activity depends on rainfall and subsequent food availability with females capable of having multiple clutches in wet years or none at all in years with low precipitation.[4,8,9]

Pressures and Stressors: Primary pressure to the Mojave-fringe toed lizard is the loss of their highly sensitive loose windblown sand habitats, which require protection from direct and indirect disturbances to persist.[10] Direct pressures to these habitats include off-highway vehicle (OHV) use, stabilization of sands by exotic species, and urbanization and indirect pressures include sand movement control near developed areas such as sand barriers and fences.[1,10] The decline of the Coachella Valley fringe-toed lizard (*Uma inornata*) is attributed to the aforementioned mechanisms, including development, OHVs, and disruption of sand movement.[10] Furthermore, increased development and landfill sites around these desert areas are associated with an increase in generalized predators such as ravens (*Corvus corax*), which may place additional predation pressure on populations.[11]

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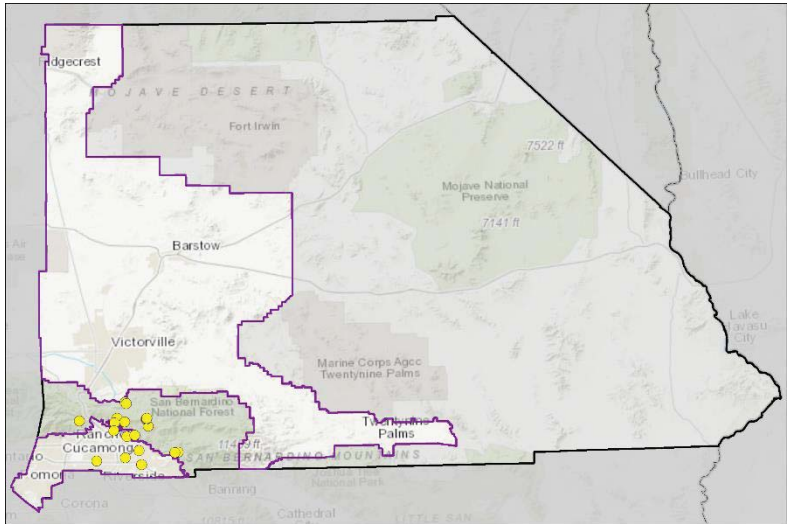
Legal Status

State: Not applicable
Federal: USFS Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: Although ringneck snakes (*D. punctatus*) range from southern Washington to Idaho south to northern Baja California, the San Bernardino subspecies is endemic to California and occurs from mid-Santa Barbara County to San Diego County and east into the San Bernardino mountains.[1] This species may also integrate with the northern subspecies (*D. p. pulchellus*) in northern Santa Barbara County and Kern County.

RCIS Distribution: A total of 33 occurrences have been recorded in the fan and foothill habitats of the Valley subarea (see inset map).[2]

Habitat Requirements: This species prefers moist habitats and is found in woodlands, forests, grasslands, chaparral, farms, and gardens.[3] In arid locations, this species is restricted to mountains, springs, and waterways. This species is usually found on the ground under bark, rotting logs, stones, and boards.[3]

Breeding: Little information is known for breeding habitat for this species.

Foraging: This species is carnivorous and consumes salamanders, small frogs, tadpoles, lizards, small snakes, insects, slugs, and earthworms.[3]

Seasonal Periods for San Bernardino Ringneck Snake[3–6]*

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding*			✓	✓	✓			✓	✓	✓		
Egg laying/hatching					✓	✓	✓	✓	✓	✓		
Hibernation*	✓	✓									✓	✓

* Seasonal periods are estimated and apply to the full species *D. punctatus*.

Reproduction: Little is known on this species reproductive biology. However, in general ringneck snakes are most active and aggregate for mating in the spring and early fall.[4,5,6] This species lay eggs from June to July, often in communal nests.[3] Females typically lay 1 to 2 clutches of 2 to 10 eggs.[3] Eggs are usually laid in loose aerated soil, stabilized talus, or in rotting logs.[7] Incubation may take between 42 to 56 days and hatching has been reported from August to October.[7,8,9,10] Ringneck snakes are most active in the spring and early fall, and are primarily nocturnal.[4] Species may aestivate during the heat of summer and generally hibernate during the winter.[9]

Pressures and Stressors: Little information is known for population pressures and stressors for this species. However, similar to *D. p. regalis*, since this species is dependent upon moist environments, overexploitation of groundwater or habitat alteration that reduces soil moisture content may impact populations.[11] In addition, climate change or prolonged drought may affect the timing and quantity of rainfall, which would reduce suitable habitat for this species.[11] Main impacts from urban development are likely habitat fragmentation and subsequent isolation of populations, since ringneck snakes are not known to disperse long distances.[12] Urban development may also increase urban predators and increase road mortality.

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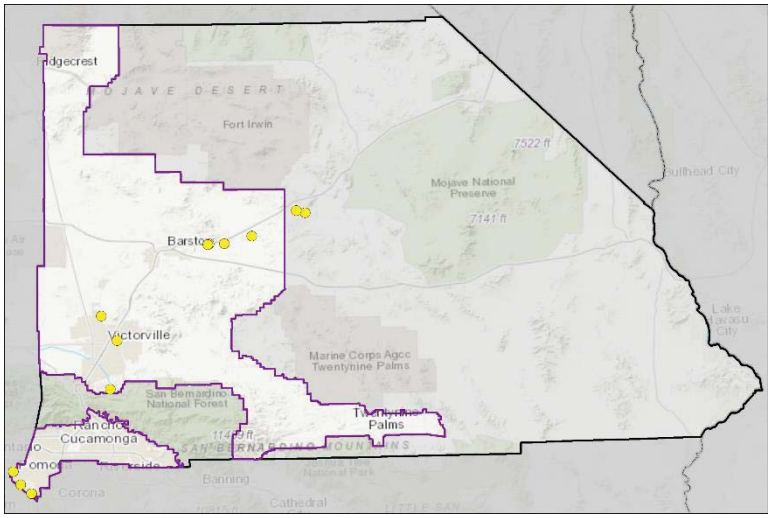
Western Pond Turtle (*Emys marmorata*)

Legal Status

State: CDFW Species of Special Concern
Federal: USFS Sensitive; BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Seasonal Periods for Western Pond Turtle[1]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding			✓	✓	✓	✓	✓	✓	✓			
Nesting				✓	✓	✓	✓	✓				
Movements to Overwintering Habitat and Dormancy*	✓	✓							✓	✓	✓	✓

* This species may be active year-round in the south[5] and becomes dormant on land throughout winter in the north or high elevations.[1]

Distribution: The western pond turtle is restricted to aquatic environments and ranges along the Pacific coast from Washington to northern Baja California, Mexico. In California, this species is found from the Pacific coast east to the Peninsular Ranges and the Sierra Nevada foothills up to elevations of 2,048 meters (6,719 feet).[1,2] Additional scattered populations are located as far east as the Mojave Desert in Afton Canyon and the Amargosa River.[3]

RCIS Distribution: In the Valley subarea, the species is known from 3 records in the Chino Hills State Park area, and in the West Desert subarea, the species is known from 6 records along the Mojave River and tributaries (see inset map).[4]

Habitat Requirements: This species is primarily aquatic and occurs in ponds, lakes, marshes, rivers, streams, and irrigation ditches that have rocky or muddy bottoms and near aquatic vegetation.[5] This species frequently basks on logs, cattail mats, and mudbanks.[1,5] This species may also enter brackish and seawater.[5,6,7] Pond turtles will use upland habitats for nesting and aestivation (for populations in the north or high elevations).[1]

Breeding: Breeding typically occurs in aquatic habitats described above.[8]

Foraging: This species is omnivorous and eats aquatic plants, insects, worms, fish, amphibian eggs and larvae, crustaceans, mollusks, and carrion.[1,4,8]

Reproduction: This species breeds throughout the spring, summer, and fall and nesting typically occurs in early spring or early summer.[1] This species lays clutches of 1 to 14 eggs between April and August. However, timing depends on location.[1,4] Incubation typically lasts 80 to 126 days and varies with latitude.[9,10] In southern California, eggs typically hatch in the early fall.[10]

Pressures and Stressors: Primary population pressures and stressors include the loss, alteration, and degradation of aquatic habitat. Over 90% of wetland habitat within its historic range in California has been removed by agricultural development, flood control, water diversion projects, and urbanization.[11,12,13] Competition and predation by introduced species may add pressure to this species' population.[1] For example, the red-eared slider (*Trachemys scripta elegans*) may serve as a competitor as well as introduce diseases into western pond turtle populations,[14] and the introduction of non-native and urban species (e.g., bullfrogs (*Lithobates catesbeianus*), bass, catfish, raccoons (*Procyon lotor*), skunks (*Spilogale gracilis*, *Mephitis mephitis*), ravens (*Corvus corax*)) may predate on western pond turtle hatchlings.[15] Population declines in this species has also been attributed to toxic spills, grazing, off-road vehicle use, and road strikes.[10] Invasion of exotic plant species may alter hydrology and channel morphology degrading suitable habitat. Increased moisture in nesting upland habitat may affect nesting success since this species' eggs are unable to expand in response to increased internal pressure in moist incubation substrates.[16]

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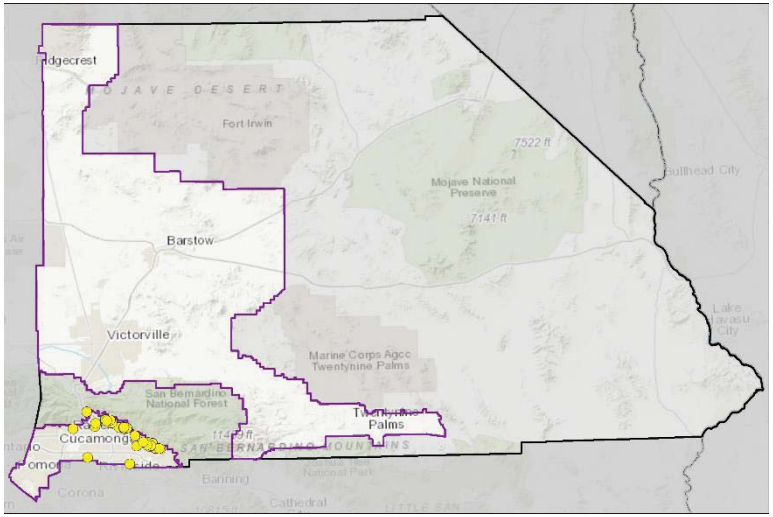
Legal Status

State: CDFW Species of Special Concern
Federal: BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable

Distribution: The western spadefoot range includes the Central Valley, bordering foothills, and Coast Ranges south of Monterey Bay to northwestern Baja California, Mexico, including Orange County, western Riverside County, and San Diego County, California.[1] This species typically occurs from sea level to 3,000 feet in elevation.[1]

RCIS Distribution: A total of 38 occurrences have recorded in the fan and foothill habitats of the Valley subarea (see inset map).[2]



Habitat Requirements: This mostly fossorial species occurs in grasslands, oak woodlands, coastal sage scrub, chaparral, and vegetation in washes, floodplains, alluvial fans, playas, and alkali flats.[1,3,4] This species prefers sandy or gravelly soils in areas with open vegetation and short grasses.[1]

Breeding: This species aestivates in upland habitat and emerges to breed. Suitable breeding habitat includes aquatic environments, such as streams and temporary pools, including artificial water sources such as cattle ponds and vernal pools.[1–5]

Foraging: Larvae are thought to be generalists consuming animals, plants and organic detritus.[3] Adults are generalized predators and consume arthropods, beetles, moths, flies, earthworms, and other prey.[3,6]

Seasonal Periods for Western Spadefoot[1]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding*	✓	✓	✓	✓	✓							
Fossorial**						✓	✓	✓	✓	✓	✓	✓

* Timing and length depend on rainfall/region and may begin in October.[3] ** Species digs burrows or uses mammal burrows.[10]

Reproduction: This species spends 8 to 10 months underground and enters water sources only to breed.[7,8,9] This species breeds January to May following late winter or spring rains in streams and temporary pools.[1] This species breeds in aggregates that can consist of over 1,000 individuals.[7] Females lay 18 to 25 clusters consisting of 300 to 500 eggs, which hatch 3 to 4 days after laying.[4,10,11] Metamorphosis may begin 58 days after hatching.[5]

Pressures and Stressors: Primary population pressures and stressors to this species include habitat loss and fragmentation due to agriculture and urban development.[3] It is estimated over 80% of historically occupied habitat in southern California and 30% of habitat in northern California has been reduced to unsuitable habitat by development and habitat conversion.[3] Invasive species, such as crayfish, bullfrogs (*Lithobates catesbeianus*), and mosquitofish (*Gambusia affinis*) may also prey upon western spadefoots at all life stages.[3,7] This species is dependent upon temperature, rainfall cues, and temporary pools that persist long enough for metamorphosis. As a result, climate change may alter the aquatic suitability of temporary breeding environments, decrease shrubland while increasing grassland habitat,[8,12] and serve as another stressor to this species populations.[3] Wildfires that occur during this species dispersal may also pose a stressor to individuals and their populations.[3]

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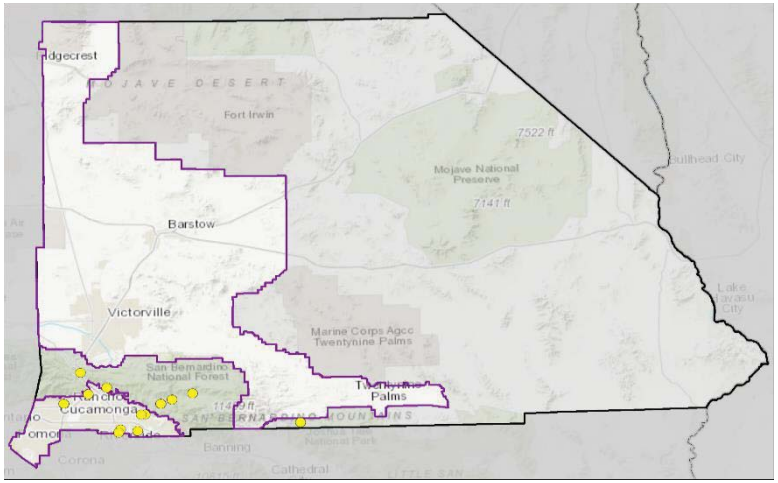
Bell's Sparrow (*Artemisiospiza belli belli*)

Subarea Focal Species: Valley

Legal Status

State: CDFW Watch List
Federal: USFWS Bird of Conservation Concern
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The Bell's sparrow occurs in chaparral and coastal scrub communities along the Coast Ranges of central California and in the Transverse Ranges of Southern California. This species occurs as a non-migratory resident on the western slope of the central Sierra Nevada Range, and in the coastal ranges of California, southward from Marin County and Trinity County, extending into north–central Baja California, Mexico.[1] The range of this subspecies overlaps with that of at least one other subspecies of Bell's sparrow in California (*A. b. canescens*).[1]

RCIS Distribution: A total of 52 occurrences have been recorded in the fan and foothill habitats of the Valley subarea (see inset map).[2]

Habitat Requirements: This subspecies occupies semi-open habitats with evenly spaced shrubs that are 1 to 2 meters high.[3] This subspecies is also found in big sagebrush (*Artemisia tridentata)* at higher elevations in Southern California mountains.[3]

Breeding: This subspecies is a resident breeder in dry chaparral and coastal sage scrub habitat along coastal lowlands, inland valleys, and lower foothills of local mountains in California. In the northern part of its range, this subspecies prefers chamise chaparral (*Adenostoma fasciculatum*) and prefers big sagebrush at higher elevations.[3]

Seasonal Periods for Bell's Sparrow[3] (resident breeder)

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding			✓	✓	✓	✓	✓					
Fledges				✓	✓	✓	✓	✓				

Foraging: This subspecies is a ground-foraging omnivore during the breeding season and a ground-gleaning granivore during the non-breeding season.[4,5]

Reproduction: Males usually sing on established territories in late January and early February. Nest building is typically conducted by female and has been observed in mid-February in Riverside County.[3] Typically, the female alone incubates between 2 to 5 eggs for 10 to 16 days.[3] The nestlings fledge between 9 to 10 days after hatching.[3]

Pressures and Stressors: Primary population pressures and stressors include the loss and fragmentation of appropriate shrub habitat. This subspecies has lost suitable habitat to urbanization and agricultural conversion, especially in Southern California.[1] Fragmentation of shrubland habitats, whether by wildfire, shrub die-off, or human-caused disturbance, significantly affects this subspecies. The Bell's sparrow is more likely to remain in an area that has high shrub cover, low disturbance, large patch sizes, and high within-site spatial similarity. This subspecies is vulnerable to brown-headed cowbird (*Molothrus ater*) nest parasitism,[1] which is more frequent near habitat edges. This subspecies is also affected by fire frequencies[6] and prefers areas where shrub cover is relatively low and dispersed.[7] Long-term fire suppression promotes tall, dense shrublands that are not suitable sage sparrows.[1] However, if fires occur too frequently, sage sparrows abandon habitats where non-native annual grasses replace shrubs.

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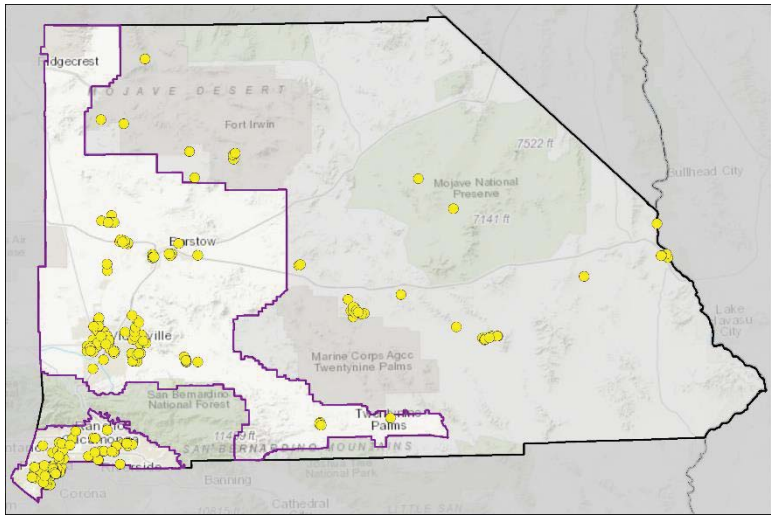
Burrowing Owl (*Athene cunicularia*)

Subarea Focal Species: Valley, West Desert

Legal Status

State: CDFW Species of Special Concern
Federal: USFWS Birds of Conservation Concern; BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The burrowing owl is distributed throughout North America.[1] In California, this species' range extends throughout the lowlands from the northern Central Valley to Mexico, with small scattered populations occurring within the Great Basin and desert regions in the southwest part of the state.[2,3] Historically, this species range occurred throughout most of California and the islands, except for north of Marin and mountain areas.[4]

RCIS Distribution: A total of 56 occurrences have been recorded throughout the Valley subarea, particularly in open grassland and agricultural areas and around the Prado Basin (see inset map).[5] In the West Desert subarea, a total of 100 occurrences have been recorded, particularly in areas that have been surveyed including in the Victor Valley area, the Barstow area, Lucerne Valley, the Morongo Basin (see inset map).[5]

Seasonal Periods for Burrowing Owl[1]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding			✓	✓	✓	✓	✓	✓				
Migration			✓	✓					✓	✓		
Winter Movements	✓										✓	✓

Habitat Requirements: This species is a grassland species that requires open habitat, well-drained soils, and areas with sparse vegetation.[1,3] However, burrowing owls also inhabit a variety of landscapes including steppes, deserts, prairies, and agricultural lands, as well as along margins of airports, agricultural roadsides, parks, and golf courses.[1,3] Suitable habitat also includes areas with burrows or burrow-like structures (e.g., culverts).[3,6]

Breeding: Suitable breeding sites consists of low, sparse vegetation;[7,8] are often associated with high densities of burrowing mammals,[1] such as ground squirrels; and always have available perching sites, such as fences or raised rodent mounds.[9]

Foraging: Burrowing owls typically forage in areas with low-growing, sparse vegetation.[1] Burrowing owls are opportunistic and prey on arthropods, small mammals, birds, amphibians, and reptiles.[1,10]

Reproduction: Nesting in California generally runs from February through August, with peak activity from March to July.[3,11,12] Burrowing owls are primarily monogamous and usually breed once per year. Typically, one clutch of 6 to 12 eggs is produced per year, with 7 to 9 eggs in a clutch. The female incubates the eggs for 28 to 30 days and young fledge at around 44 days.[1]

Pressures and Stressors: The most significant pressures and stressors to the burrowing owl is the conversion of grassland and farmland habitat to urban landscapes or unsuitable crops such as vineyards, orchards, corn fields, cotton, or similar.[3,13] The loss of agricultural fields and similar open spaces will also place additional stress on burrowing owl populations.[3] Vehicle collisions may be a significant cause of mortality in some areas.[1,14] In addition, the decline of fossorial species or the extermination of fossorial pests (such as ground squirrels or rodents) across the burrowing owl range may reduce suitable nesting sites and prey abundance for this species.[1,3] Pesticides along crop and rangelands may also affect burrowing owl individuals and populations.[3,7]

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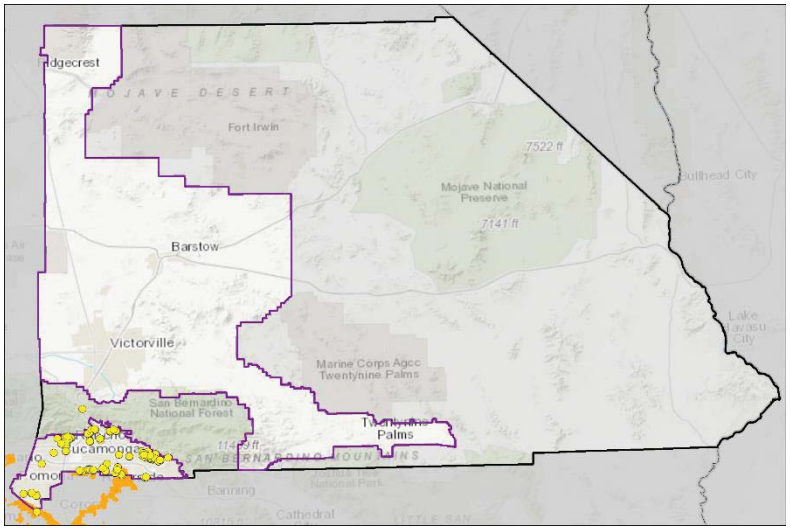
Legal Status

State: CDFW Species of Special Concern

Federal: Threatened

Critical Habitat: Originally designated on April 24, 2003[1]; USFWS issued revised designation of critical habitat on December 19, 2007 (orange areas on inset map).[2]

Recovery Plan: Not applicable



Distribution: The coastal California gnatcatcher occurs year-round from Southern California south to northwestern Baja California.[3] This species is typically located below elevations of 500 meters (1,640 feet) with more than 99% of the known populations occurring below 770 meters (2,500 feet).[4,5,6] Due to California topography, higher elevation populations are located more inland where population densities are less than coastal areas.[4]

RCIS Distribution: A total of 128 occurrences have been recorded throughout the Valley subarea, particularly in scrub habitats in the foothills, Chino Hills, and Reche Canyon; however, only 51 of these occurrences were recorded in 2000 or later (see inset map).[7]

Seasonal Periods for Coastal California Gnatcatcher (resident breeder)[3,6]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding		✓	✓	✓	✓	✓	✓					
Fledges			✓	✓	✓	✓	✓	✓				

Habitat Requirements: In Southern California, this species is known as an obligate resident of coastal sage scrub,[3] which consists of relatively low-growing, dry-season deciduous and succulent plants. However, this species also occurs in communities that are in close proximity to coastal sage scrub, such as chaparral, grassland, riparian, and subassociations of coastal sage scrub (e.g., Riversidian scrub).[8]

Breeding: In Southern California, this species nests in coastal sage scrub, typically on slopes, and within shrubs, such as California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), black sage (*Salvia mellifera*), and California sunflower (*Encelia californica*).[3,9,10]

Foraging: This species is insectivorous and gleans prey from foliage while moving quickly through shrub.[3] In San Diego County, most foraging occurs in California sagebrush, California buckwheat, and laurel sumac (*Malosma laurina*).[11]

Reproduction: California gnatcatcher breeding season extends from late February to July with the most nest initiations occurring from mid-March to mid-May.[6] Both males and females construct the nest, incubate eggs, and care for young. Incubation of typically 4 eggs occurs approximately 14 days before hatching.[6] The nestlings fledge approximately 14 days after hatching.[3]

Pressures and Stressors: Primary population pressures and stressors include loss and/or destruction of coastal sage scrub habitat, where as early as 1970 up to 90% of coastal sage scrub was lost due to development and land conversion.[12,13,14] Additional stressors to coastal sage scrub communities include agricultural uses, urbanization, air pollution, increased fire frequencies, and introduction of exotics. High fire frequencies with a lag recovery time may also significantly reduce the viability of local populations of the California gnatcatcher.[15] Predation and nest predators invoke another stressor for this species, and include predators such as snakes, squirrels, coyotes (*Canis latrans*), and urban-adapted animals.[16] Another possible stressor includes brood parasitism by the brown-headed cowbird (*Molothrus ater*).[16]

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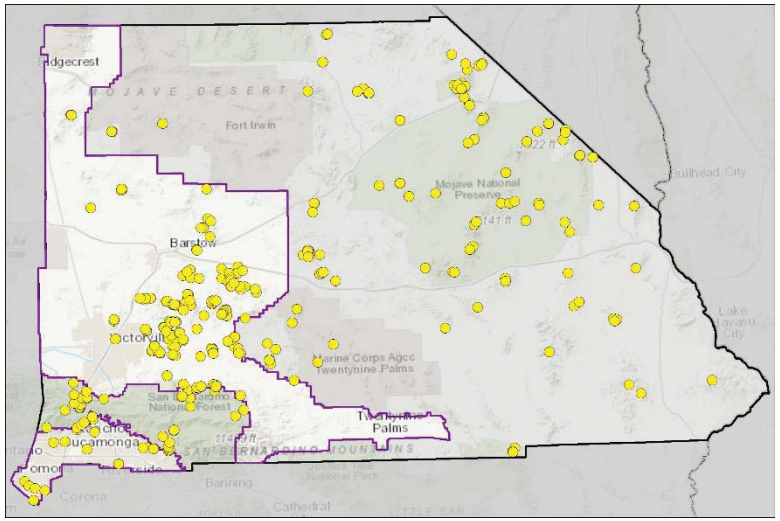
Golden Eagle (*Aquila chrysaetos*)

Subarea Focal Species: West Desert

Legal Status

State: CDFW Fully Protected; CDFW Watch List; California Department of Forestry and Fire Protection Sensitive
Federal: USFWS Birds of Conservation Concern; BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: Although the golden eagle occurs in a wide range of habitats throughout North America,[1] it is more common in the Western United States, from North Dakota south to Texas and west to the Pacific Ocean.[1] This species occurs around open spaces (used for hunting) and cliffs (used for nesting).[1] Generally, paired individuals in southern United States are resident and those in the northern portion of their range migrate south for the winter.[2]

RCIS Distribution: A total of 150 occurrences have been recorded in the West Desert subarea, particularly in the Granite Mountains area south of Barstow; however, these records include multiple alternative nest site locations that may be used by single pairs (see inset map).[3]

Habitat Requirements: This species inhabits open and semi-open areas at elevations ranging from sea level to 3,630 meters (11,909 feet) in elevation.[1,2] This species may be found in a variety of habitats including tundra, shrublands, grasslands, woodlands, brushlands, coniferous forests, farmlands, and riparian habitats.[1,2]

Breeding: Typically, suitable breeding habitat consists of cliffs and large trees in open areas.[6]

Foraging: This species is carnivorous and typically hunts small to medium-sized mammals such as hares, rabbits, and ground squirrels.[1]

Seasonal Periods for Golden Eagle[4,5]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding	✓	✓	✓	✓	✓	✓	✓	✓				
Migration*		✓	✓	✓					✓	✓	✓	✓

* Year-round resident in southern California

Reproduction: In Southern California, golden eagle pairs begin constructing nests (large platforms of sticks, twigs, and vegetation) in fall and continue through the winter.[1,3,7] Resident pairs add material to nests year round and are known to re-use or maintain alternative nesting sites.[1,3] Nest construction usually begins between 1 to 3 months before egg laying.[1] Both males and females construct nests, incubate between 1 to 3 eggs, and care for young.[1] This species only has one brood per season but may re-nest following an unsuccessful attempt.[1] Young may leave the nest as early as 45 days after hatching.[1]

Pressures and Stressors: Primary population pressures and stressors include mortality from human activity. Over 75% of recorded deaths were directly or indirectly attributed to human activities, including accidental trauma (27%; e.g., collisions with vehicles, power lines, or other structures), electrocution (25%), gunshot (15%), and poisoning (6%).[1,8] Other population stressors include historical shooting and trapping (where depredation of livestock was suspected), incidental trapping and poisoning, Native American harvest and religious uses, ingestion of lead, disturbances and subsequent abandonment at the nest and roosting sites, and degradation of habitat (including wildfires, land conversion and development, and urbanization).[1]

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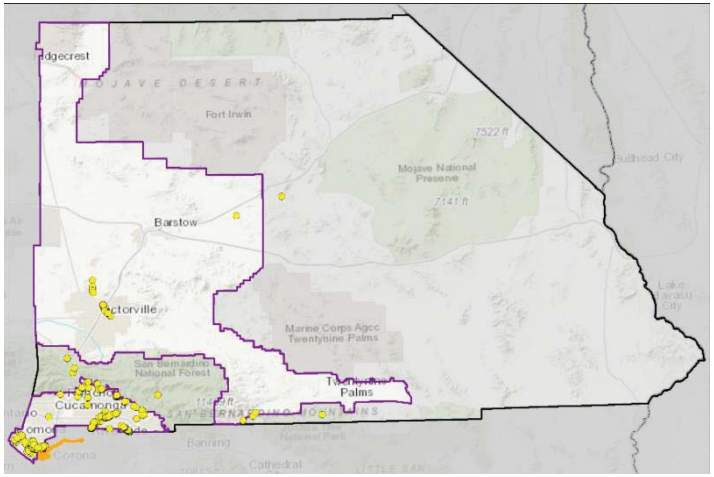
Legal Status

State: Endangered
Federal: Endangered
Critical Habitat: Designated on February 2, 1994[1] (orange on inset map)
Recovery Plan: Draft issued by the USFWS on May 6, 1998[2]



Distribution: The migratory Bell's vireo is a species that breeds in North America. The least Bell's vireo subspecies breeds in riparian habitats in the southwestern United States. Historically, this subspecies was abundant and ranged from northern California (Red Bluff, Tehama County) south through the Sacramento Valley and Sierra Nevada foothills and into the Coast Ranges from Santa Clara County to Baja California.[2] This subspecies breeding range has been greatly reduced from historical accounts. Currently, this subspecies' breeding range includes coastal and inland Southern California south to northern Baja California.[6] This migratory subspecies overwinters along southern Baja California, with some winter records located in southwestern California.[3]

RCIS Distribution: A total of 417 occurrences have been recorded throughout the Valley subarea, particularly along the Santa Ana River corridor, San Timeteo Creek, Chino Hills State Park, and foothill tributaries; however, the occurrence dataset for this species likely includes duplicate records and records from multiple survey years in the same location (see inset map).[7] In the West Desert subarea, a total of 43 occurrences have been recorded along the Mojave River corridor, particularly from Mojave Narrows to Helendale, and in Big and Little Morongo Canyons at the edge of the Morongo Basin (see inset map).[7]

Seasonal Periods for Least Bell's Vireo[3,4,5]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding				✓	✓	✓	✓					
Migration		✓	✓	✓				✓	✓	✓		
Wintering	✓	✓								✓	✓	✓

Habitat Requirements: This subspecies is a riparian obligate and restricted to riparian scrub habitats.[6]

Breeding: Breeding habitat for this subspecies typically includes dense, low, shrubby vegetation in early successional stages in riparian habitat (e.g., willows (*Salix* sp.), mulefat (*Baccharis salicifolia*)).[6] Understory scrub and density from 0.6–3.0 meters above ground is the most critical structural component of this subspecies habitat.[8,9]

Foraging: This subspecies is insectivorous and forages throughout all layers of the canopies.[6]

Reproduction: Males arrive at the breeding sites between mid-March to mid-April.[6] Females arrive 1 to 2 weeks after males.[6] Nest building, incubation, and care of young is conducted by both male and females. The pair incubates three to four eggs for an average of 14 days and nestlings fledge between 10 to 12 days after hatching.[6] Least Bell's vireos will readily re-nest following an unsuccessful attempt and may also re-nest after a successful attempt.[6]

Pressures and Stressors: A major threat to least Bell's vireo populations and riparian habitats include the loss of habitat due to agricultural practices, urbanization, and exotic/invasive plant species.[10] Land use patterns along rivers, streams, and other riparian corridors may have a strong influence on vireo presence and/or habitat suitability during the breeding season.[6] Habitat modification (e.g., reservoir water releases into low-lying suitable riparian habitat) may also affect vireo breeding populations.[6] Predation on nests and adults due to predator releases or introduction of non-native predators (e.g., Argentine ants (*Linepithema humile*), domestic cats) near fragmented or urbanized environments may pose pressures on this species' population.[10] In addition, nest parasitism by the brown-headed cowbird (*Molothrus ater*) reduces the nesting success of this subspecies.[11] Annual productivity of least Bell's vireos has been found to increase by one young for each 30% reduction in parasitism frequency.[11]

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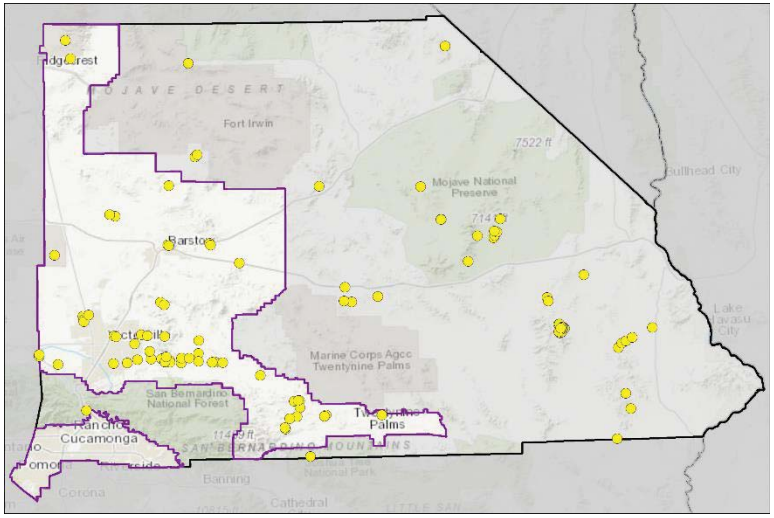
Le Conte's Thrasher (*Toxostoma lecontei*)

Legal Status

State: CDFW Species of Special Concern (San Joaquin Population)
Federal: USFWS Birds of Conservation Concern
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The Le Conte's thrasher is a year-round permanent resident in deserts in the southwestern United States including southern Nevada, western Arizona, and Southern California. In Southern California this species is found from southern Mono County to the Mexico border, including the San Joaquin Valley, and the Mojave and Colorado deserts. This species has a patchy distribution within its range.[1,2]

RCIS Distribution: The species is known from 61 occurrence records scattered throughout the West Desert subarea, including the Victor Valley and foothills, Lucerne Valley and foothills, and the Morongo Basin (see insert map).[3]

Habitat Requirements: This species typically occurs in open desert wash, desert scrub, alkali desert scrub, desert succulent shrub, and Joshua tree (*Yucca brevifolia*) habitats with scattered trees.[1] This species prefers gently rolling to well drained slopes with bare ground or sparse grasses.[4]

Breeding: Suitable breeding habitat consists of dense, spiny shrubs or densely branched cactus in desert wash habitat. This species may also nest in a variety of shrubs, small trees, and yucca.[1]

Foraging: This species is insectivorous and consumes insects found within leaf litter under desert shrubs.[2]

Seasonal Periods for Le Conte's Thrasher[2]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding		✓	✓	✓	✓	✓						
Wintering	✓						✓	✓	✓	✓	✓	✓

Reproduction: Pair formation has been recorded in all months in this species.[2] Nest building may begin as early as mid- or late-January in the southern part of its range.[2] Both males and females construct the nest, incubate between 2 to 5 eggs, and care for young that fledge around 15 days after hatching.[2]

Pressures and Stressors: Primary population pressures and stressors include habitat loss and degradation.[2,4] In addition, this species is vulnerable to human disturbance, shooting, trapping, pesticides, and loss of suitable habitat by development and agricultural expansion.[1,2] Conversion of suitable habitat has also resulted in population fragmentation.[4] Additional threats include habitat destruction from all-terrain vehicles, which remove or reduce litter around shrubs and can damage vegetation. Since water is not essential to this species diet, this species does not utilize irrigated fields, watered lawns, or other landscapes that result a unnatural increase in water to the landscape.[2] Populations within the San Joaquin Valley, in particular, are vulnerable to becoming further isolated or severely reduced due to these population pressures and stressors.[4]

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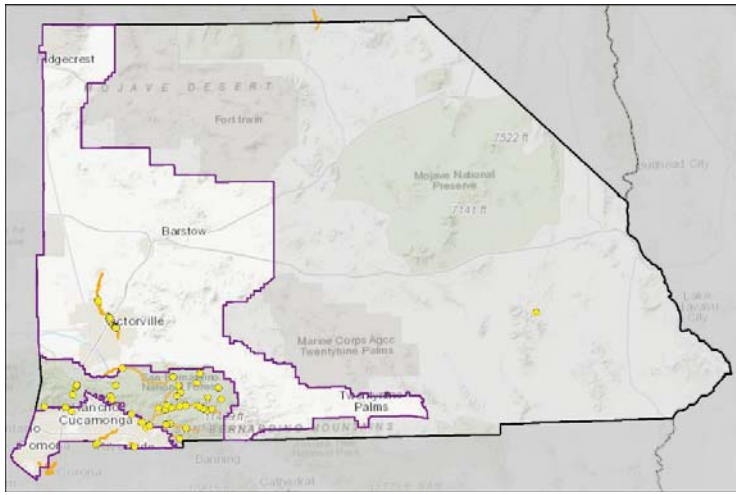
Legal Status

State: Endangered (full species)

Federal: Endangered (southwestern subspecies)

Critical Habitat: Originally designated on October 19, 2005[1]; USFWS issued revised critical habitat on January 3, 2013[2] (orange on inset map)

Recovery Plan: Issued by the USFWS on August 30, 2002[3]



Distribution: The southwestern willow flycatcher subspecies breeding range includes riparian habitats in the southern one-third of California, southern Nevada, Arizona, New Mexico, western Texas, and northern Mexico.[3,4] In California this species range extends as far north as the Santa Ynez River, Kern River, and the town of Independence on the Owens River.[5] Outside of California, historical breeding has occurred in southern Nevada, southern Utah, Arizona, New Mexico, and southwestern Colorado.[4,6] No other subspecies of willow flycatchers are known to nest in the area. Additional subspecies that may migrate through include little willow flycatchers (*E. t. brewsteri*) and Great Basin willow flycatcher (*E. t. adastus*).

RCIS Distribution: A total of 34 occurrences of southwestern willow flycatcher and 11 occurrences of willow flycatcher (not identified to subspecies) have been recorded in the Valley subarea along the Santa Ana River corridor, San Timeteo Creek, Chino Hills State Park, and foothill tributaries.[7] A total of 6 occurrences of southwestern willow flycatcher and 18 occurrences of willow flycatcher (not identified to subspecies) have been recorded in the West Desert subarea, all along the Mojave River corridor from Mojave Narrows to just north of Oro Grande. The species is also known from the Mojave River upstream (south) of the Mojave Forks dam, which is just outside the RCIS Area.[7]

Seasonal Periods for Southwestern Willow Flycatcher[3,8]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Arrival					✓	✓						
Breeding					✓	✓	✓	✓				
Fledges						✓	✓					
Migration South								✓	✓			

Habitat Requirements: This subspecies is restricted to riparian habitats occurring along streams or in meadows.[4,5]

Breeding: Suitable breeding habitat consists of a dense mid-story and understory and can also include a dense canopy.[8] However, suitable vegetation is not uniformly dense and typically includes interspersed patches of open habitat. Typical plant species associated with their habitat includes willows (*Salix* spp.), mulefat (*Baccharis salicifolia*), stinging nettle (*Urtica dioica*), cottonwood (*Populus fremontii*), tamarisk (*Tamarix* spp.), and Russian olive (*Elaeagnus angustifolia*).[7]

Foraging: This species is insectivorous and forages at the edges or internal openings of their territory, above the canopy or over open water.[3]

Reproduction: Males arrive at the breeding sites between early May and early June.[3] Females arrive 1 to 2 weeks after males.[9] Nest building is typically conducted by females and begins approximately 2 weeks after pair formation. The female incubates 3 to 4 eggs[10] for an average of 12 to 13 days and provides the majority of care for the young. The nestlings fledge between 12 and 15 days after hatching.[4] Southwestern willow flycatcher will typically re-nest following an unsuccessful attempt and less frequently may re-nest following a successful attempt.[3]

Pressures and Stressors: Primary population threats include loss, modification, and fragmentation of suitable riparian habitat.[4] In general, increased human populations and development have resulted in a decline of riparian habitat, a habitat type that is naturally rare, patchy, and dynamic in the Southwest due to the varying hydrologic conditions of the region. The specific primary causes for loss and modification of riparian habitats have been dams and reservoirs, water diversion and groundwater pumping, channelization, flood control, agriculture, recreation, and urbanization.[4]

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Swainson's Hawk (*Buteo swainsoni*)

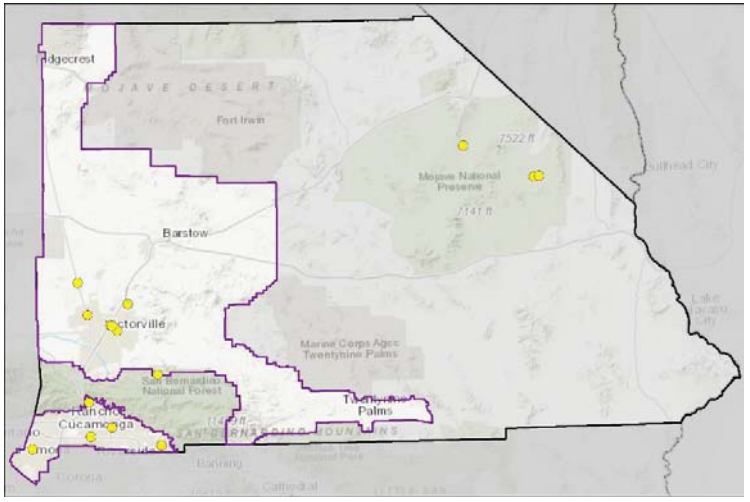
Subarea Focal Species: West Desert

Legal Status

State: Threatened
Federal: USFWS Birds of Conservation Concern; BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable

Distribution: The Swainson's hawk breeds widely across North American, generally from northern Mexico to central Canada and the interior valleys of British Columbia.[1] In the United States, this species breeds from the Great Plains west to the Great Basin and south into the southwestern deserts of New Mexico and eastern Arizona. This species also extends east to Iowa, Minnesota, and Missouri. In California, this species breeds throughout the Central Valley, western Mojave Desert, Owens Valley, and far northeastern portion of California.[1,2] This species is migratory and mostly winters in Central and South America.[1] Historically, this species bred in coastal southern California, central Coast Ranges, and Mojave desert; the species is now considered to be extirpated from these areas.[1]

RCIS Distribution: A total of 2 occurrences for Swainson's hawk have been recorded since 1990 in the West Desert subarea, including along the Mojave River corridor and near the National Forest boundary south of Lucerne Valley. The species was previously recorded using desert habitats near Adelanto and Helendale and elsewhere along the Mojave River; however, these records are from before 1948 (see map inset).[4]



Seasonal Periods for Swainson's Hawk[1,3]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding*				✓	✓	✓	✓	✓				
Migration		✓	✓						✓	✓		
Wintering	✓	✓									✓	✓

* Central Valley breeders typically arrive earlier than other populations.

Habitat Requirements: This species is primarily associated with grasslands, but also found in sparse shrubland and small open woodlands.[1]

Breeding: Suitable breeding habitat includes grasslands, shrub-steppe, desert, and agricultural areas.[1] Swainson's hawks generally nest in isolated trees, narrow strands of vegetation, or along riparian corridors within grassland, shrubland, or agricultural landscapes.[5] In the desert, this species is known to utilize Joshua trees (*Yucca brevifolia*) as well as other roadside or wind row ornamental trees as suitable nesting sites.[5] In California overall, approximately 95% of pairs breed in the Central Valley, with over 90% of breeding occurring between Modesto and Sacramento.[6]

Foraging: Swainson's hawk forages in open grasslands, shrub steppe, and agricultural areas.[1] In California, this species primarily preys upon small rodents but also consumes birds, snakes, and insects (particularly grasshoppers and crickets).[7] In the western Mojave, this species chiefly preys upon Botta's pocket gopher (*Thomomys bottae*) in agricultural areas, but it also consumes a wider variety of prey in open desert grasslands and scrub.[5]

Reproduction: Individuals arrive at breeding grounds around early March in central California. Both the male and female construct or refurbish an old nest. Female incubates between 1 to 4 eggs, and young fledge around 43 days after hatching.[1]

Pressures and Stressors: Primary population pressures and stressors include loss of foraging and nesting habitat to residential development and land conversion to crops not suitable for foraging (e.g., rice, cotton, orchards, vineyards).[8] These habitat losses include the removal of riparian vegetation and tree removal due to urban development and land conversion.[9] Impacts from development of renewable energy (e.g., solar and wind) in the Central Valley is also a stressor on this species' population.[5] Poisoning by insecticides on wintering grounds has also contributed to the death of tens of thousands of Swainson's hawks.[10,11]

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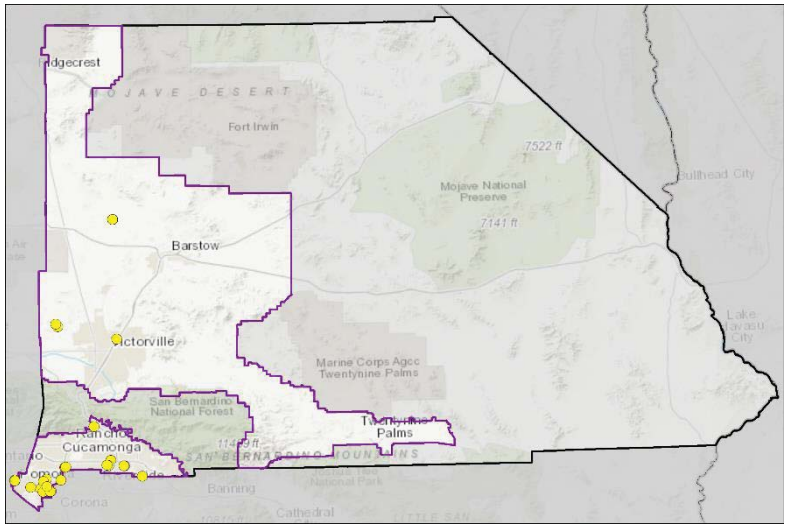
Tricolored Blackbird (*Agelaius tricolor*)

Legal Status

State: Candidate Endangered; CDFW Species of Special Concern
Federal: Candidate Endangered; USFWS Birds of Conservation Concern; BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The tricolored blackbird occurs in the western United States with more than 99% of the population occurring within California.[1] Scattered populations also occur within Oregon, central Washington, at one site in western Nevada, and locally in northwestern Baja California.[1] In California, this species is restricted to the central valley and surrounding foothills; coastal and inland locations in southern and central California; and scattered locations in Northern California.[1] Tricolored blackbirds are known to winter throughout the Sacramento Valley where they are mostly associated with livestock.[1] This species current range is similar to its historical range; however, historically the species was significantly more abundant throughout its range.[1]

RCIS Distribution: A total of 20 occurrence records[2] and 8 colony locations[3] have been recorded in the Valley subarea, primarily located in the Prado Basin area near Chino, along the Santa Ana River corridor, and the Loma Linda hills. A total of 4 occurrence records[2] and 5 colony locations[3] have been recorded in the West Desert subarea, including along the Mojave River corridor, in agricultural fields near El Mirage and the agricultural lands near Newberry Springs.

Seasonal Periods for Tricolored Blackbird[5]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Colony Formation			✓	✓	✓							
Breeding			✓	✓	✓	✓	✓					
Migration			✓	✓	✓	✓	✓	✓	✓	✓		

Habitat Requirements: This species typically nests in marshes and wetlands; however, it will also use weedy/fallow fields, certain agricultural crops, and uplands shrubs for nesting.[1] In the winter this species is known to occur on pastureland, cultivated cropland, and livestock feedstores.[1]

Breeding: This species breeds in colonies. Suitable colony breeding sites require accessible freshwater, protected nesting locations (e.g., thorny vegetation), and suitable foraging areas. Typically this species nests in marshes and wetlands, but it may also utilize other vegetation such as willows (*Salix* sp.), thistles, and nettles.[1,4]

Foraging: This species is an opportunistic forager that forages in shallow flooded fields, crops, annual grasslands, cattle feedlots, and dairies.[5] Tricolored blackbird consumes any locally abundance insects and are known to exploit storage bins of livestock food.[1]

Reproduction: This species is a strong colonial nesting bird with historically as many as 20,000–30,000 individual nests recorded in marshes of 9 acres or less.[6,7] Most initial nesting occurs from late March to April with breeding completed by late July to early August.[1] Females alone build nests and incubate clutches of 3 to 4 eggs.[1]

Pressures and Stressors: The greatest population pressures and stressor for this species is the degradation, alteration, and loss of habitat due to human activities.[1,5] Historically, nearly all suitable grasslands, marshlands, and riparian woodlands in the Central Valley supported this species.[1] However, most of the Central Valley has been converted to agriculture and urban landsacpes.[1] In addition, urbanization in Southern California has reduced suitable habitat and current populations to a few thousand birds.[1] Harvesting and plowing of occupied grain fields have contributed to destruction of nesting colonies.[1,8,9] In addition, spring burning and disking of marshes have reduced the number of suitable breeding sites.[10,11] Additional stressors include shooting, trapping, poisoning, the use of pesticides or other toxins, and nest abandonment due to human entry into colonies.[1]

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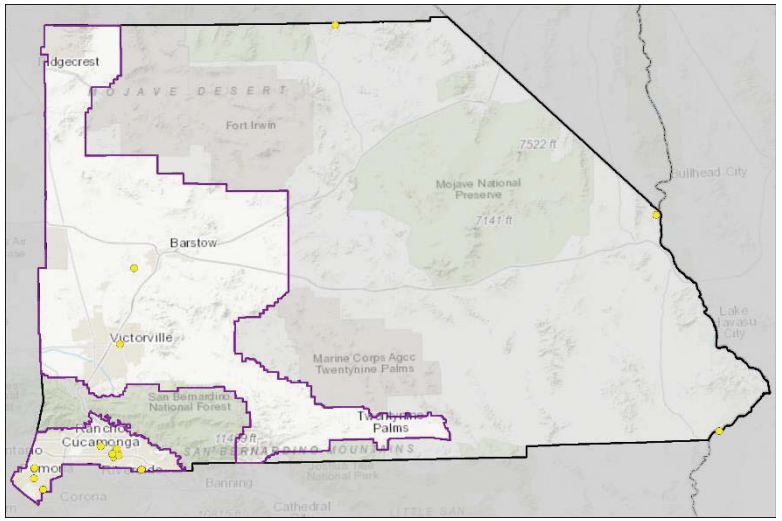
Legal Status

State: Endangered

Federal: Threatened; BLM Sensitive; USFS Sensitive; USFWS Birds of Conservation Concern

Critical Habitat: Designated August 15, 2014[1]

Recovery Plan: Not applicable



Distribution: Currently, this subspecies' breeding range is generally located west of the crest of the Rocky Mountains from southwestern British Columbia, Washington, Utah, Colorado, Texas, and into Mexico.[2,3] This subspecies breeds along river valleys in southern and western New Mexico and central and southern Arizona. The western yellow-billed cuckoo subspecies is a rare summer resident found at locally scattered locations in California.[4] In California, this species has been found breeding at isolated sites in the Sacramento Valley and along the Kern and Colorado rivers.[3] This species winters almost exclusively in South America east of the Andes.[3] Historically, in California, this species breeding range was widespread and locally common.[5]

RCIS Distribution: A total of 9 occurrences have been recorded in the Valley subarea along the Santa Ana River corridor, San Timeteo Creek, and in the Prado Basin area around Chino; in the West Desert subarea, the species is known only from the Mojave River corridor.[6]

Seasonal Periods for Western Yellow-Billed Cuckoo[3,4,8]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding					✓*	✓	✓	✓	✓			
Migration									✓	✓		

* Breeding in late May is rare.

Habitat Requirements: This subspecies is found in valley foothills and desert riparian habitats.[4] The western yellow-billed cuckoo prefers open woodlands with low, dense, scrubby vegetation that is often associated with water ways.[3]

Breeding: Suitable breeding habitat consists of dense, wide riparian woodlands and forest with well-developed understories, such as cottonwood-willow riparian habitats.[3,7]

Foraging: The western yellow-billed cuckoo is omnivorous and primarily consumes large insects, such as caterpillars, grasshoppers, and crickets.[3] However, this subspecies will occasional eat small amphibians and reptiles, eggs, young birds, and fruit and seeds.[3]

Reproduction: Pair formation typically occurs in mid-June or later in the western populations of yellow-billed cuckoo with peak breeding occurring mid-July to early August. Both males and females construct nests, incubate between 1 to 5 eggs, and care for the young. In this subspecies, cooperative breeding may occur on occasion. Young fledge the nest between 7 to 9 days after hatching.[3]

Pressures and Stressors: Primary population pressures and stressors include fragmentation and degradation of riparian woodlands due to agriculture and urban development.[9] Human modification of natural hydrological processes and waterways (e.g., damming rivers, diversion of surface/groundwater; flood control methods, construction along rivers, agriculture/grazing activities, introduction of invasive species) add pressure to this subspecies population.[3,10] The introduction of non-native species into riparian habitats may also reduce the suitable nesting substrates in the region.[10] In addition, pesticide use may directly cause mortality from toxicity, or indirectly lead to mortality through changes in individual's behavior.[11]

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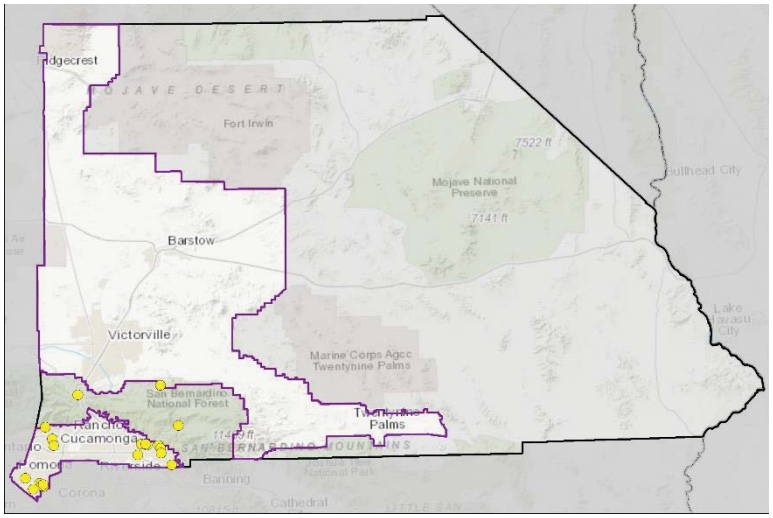
Legal Status

State: CDFW Fully Protected
Federal: BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The white-tailed kite occurs in California, Texas, Florida, Oregon, Washington, and central portions of North America.[1,2] However, the center of breeding activity in the United States occurs in California in nearly all areas up to the western Sierra Nevada foothills and southwest deserts.[1] Breeding is common in the Central Valley and along the coast of California.[1] Although the white-tailed kite is resident throughout its range, this species does disperse during the winter and is observed throughout most of California during the winter.[1,3]

RCIS Distribution: A total of 18 occurrences have been recorded in the Valley subarea in the Chino Hills State Park and Prado Basin area, in the Upper Santa Ana River wash area, and in foothill areas around Rancho Cucamonga and Yucaipa.[5]

Seasonal Periods for White-Tailed Kite[1,4]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding		✓	✓	✓	✓	✓	✓	✓				
Post-breeding dispersal							✓	✓	✓	✓		
Communal night roosting	✓	✓					✓	✓	✓	✓	✓	✓

Habitat Requirements: This species occurs in a variety of habitats, including grasslands, agriculture, savannahs, wetlands, and oak woodlands.[1]

Breeding: Suitable breeding habitat includes open areas adjacent to suitable nesting trees.[1] Tree species used for nesting is extremely variable and may include small shrubs (less than 3 meters tall) to tall trees (over 50 meters tall).[1,6] Trees used for nesting range from single isolated to large clusters.[1]

Foraging: This species consumes small mammals and prefers ungrazed grasslands, wetlands dominated by grasses, and fence rows/irrigation ditches next to grazed lands.[7]

Reproduction: Although pairs are observed together year round most observations of pairs occur December through August.[1] Both males and females construct nests over a few weeks from January to August.[1] The female alone incubates typically 4 eggs for 30 to 32 days while the male guards the nests and hunts for the pair. Young fledge the nest 4 to 5 weeks after hatching.[1,8] This species is also known to communally roost in the summer, fall, and winter. Roosting typically occurs in small stands of trees but has also been documented in open fields and orchards.[9]

Pressures and Stressors: Pressures and stressors include degradation and loss of nesting trees and foraging habitat and a reduction in prey availability.[1,10] Factors that may affect population trends include conversion of natural/agricultural lands to urban/commercial uses; farming techniques that leave little vegetative areas for prey; competition for nesting trees; long-term drought; and disturbance at nests.[1]

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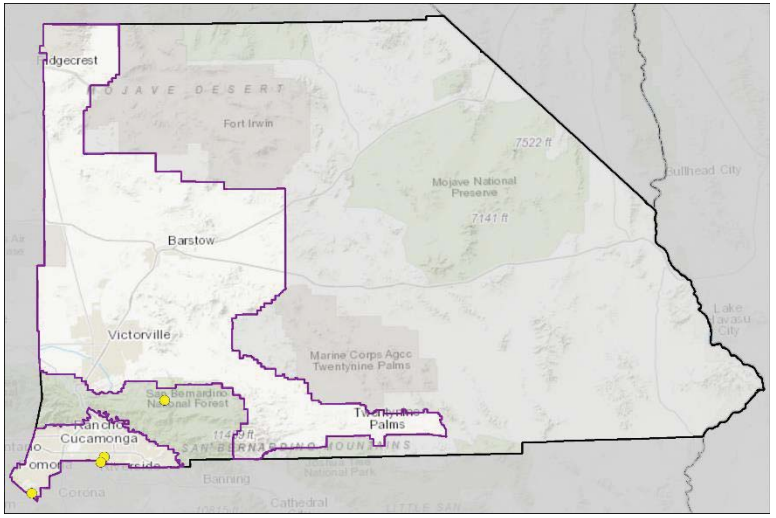
Legal Status

State: CDFW Species of Special Concern
Federal: USFS Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The arroyo chub is limited to coastal Southern California freshwater rivers and streams. This species native range included the Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita rivers as well as the Malibu and San Juan creeks in Southern California.[1] Introductions into the Santa Ynez, Ventura, Santa Maria, Cuyama, Santa Clara (some studies include the upper Santa Clara River as native range[2,3]), and Mojave river systems among other smaller streams (e.g., Arroyo Grande Creek) have expanded their distribution within California.[2,3,4,5] Largely extirpated from most of their native range, arroyo chub is considered common only within the upper Santa Margarita River and its tributary De Luz Creek, Trabuco Creek below O'Neill Park, San Juan Creek, Malibu Creek,[6] and the west fork of the San Gabriel River below Cogswell Reservoir.[7] In the 1930s, arroyo chub was introduced into tributaries of the Mojave River, particularly Deep Creek, and has since hybridized with the Mohave tui chub (*Siphateles bicolor mohavensis*).[8,9]

RCIS Distribution: In the Valley subarea, 2 occurrence records show that the species is known from the Santa Ana River downstream (south) of Interstate 10 in the West Colton area (see inset map).[10] The species also occurs further downstream on the Santa Ana River in the Jurupa Valley of Riverside County. There is also a record for the species in a tributary to the Santa Ana River in the Chino Hills State Park.

Seasonal Periods for Arroyo Chub[5]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Spawning		✓	✓	✓	✓	✓	✓	✓				

Habitat Requirements: Arroyo chub habitat includes headwaters, creeks, rivers, and intermittent streams.[3] This species is physiologically adapted to survive in hypoxic conditions, as well as within wide temperature fluctuations, both of which occur in Southern California coastal streams.[9] They are most often found in riverine systems characterized by slow-moving water, mud or sand substrate, depths greater than 40 centimeters,[1] and gradients of less than a 2.5% slope.[11] The arroyo chub feeds primarily on algae, but it also feeds on insects and small crustaceans.[12]

Spawning: Suitable spawning habitat includes areas with low velocity such as pools or edge waters, and occurs in temperatures approximately from 14ºC to 22ºC (57ºF to 72ºF).[13]

Reproduction: Arroyo chubs fractionally spawn from February through August, although breeding is concentrated in the months of June and July.[5] Fertilized embryos adhere to various substrates, including rocks, plants, and debris, and will hatch in 4 days at 24ºC.[13]

Pressures and Stressors: Primary pressures and stressors include major dams altering flows and fragmenting populations, fire with associated debris and erosion, and competition with or predation from alien species.[13] Urbanization is also a major pressure, altering habitat through channelization, pollution, water diversion, and transportation infrastructure occurring along large portions of the arroyo chub's native range.[13] Hybridization with other species as in the Cuyama River with the California roach (*Hesperoleucus symmetricus*) and in the Mojave River with the endangered Mojave tui chub[8,9] negatively affect the genetic viability of arroyo chub populations.

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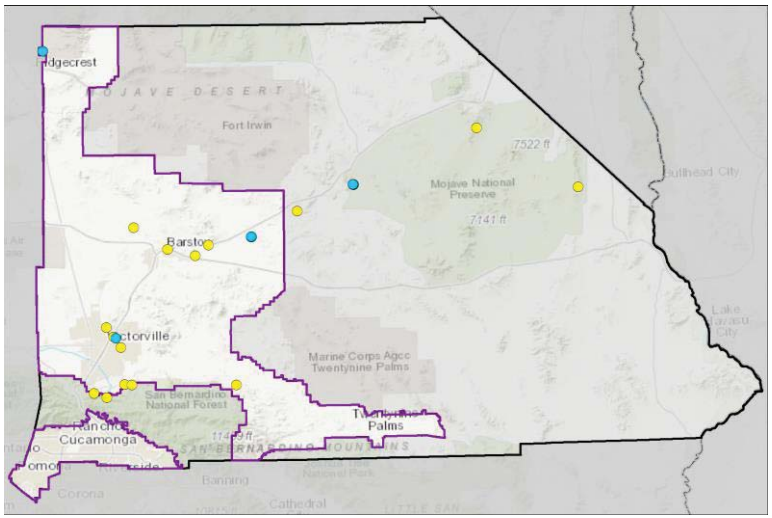
Mohave Tui Chub (*Siphateles bicolor mohavensis*)

Legal Status

State: Endangered; CDFW Fully Protected
Federal: Endangered[1]
Critical Habitat: Not applicable
Recovery Plan: Issued by the USFWS on September 12, 1984[2]



Distribution: Historically, the Mohave tui chub is thought to have occurred throughout the Mojave River basin in San Bernardino County, California, as the river's only endemic fish species.[2] At the time of listing in 1970, this species was only found at three locations in San Bernardino County, including Piute Creek, Two Hole Spring, Soda Springs, and at one location in Clark County, Nevada, at Paradise Spa.[3] This species has been extirpated from almost the entirety of its native range within the Mojave River basin, but it continues to persist at MC Spring, a site within Soda Springs at the headwaters of the Mojave River.[3] As of 2011, the Mohave tui chub can only be found in highly modified lacustrine pools at five isolated locations including Soda Springs and Morning Star at the Mojave National Preserve, Lark Seep at the China Lake Naval Air Weapons Station, Camp Cady Wildlife Area, and at Lewis Center in Apple Valley.[4]

RCIS Distribution: The species locations at Lark Seep at the China Lake Naval Air Weapons Station, Camp Cady Wildlife Area, and Lewis Center in Apple Valley occur in the West Desert subarea (blue points on inset map).[5]

Seasonal Periods for Mohave Tui Chub[2,3]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Spawning			✓	✓	✓	✓	✓	✓	✓	✓		

Habitat Requirements: This species occurs in freshwater lacustrine systems, and it is historically associated with deep pools and slough-like areas within the desert wash and riparian habitats of the Mojave River.[6] Ideal habitat is characterized by a depth of at least 4 feet, aquatic vegetation, and freshwater flow for a mineralized, alkaline environment.[3,7] Mohave tui chub have been found to tolerate temperature ranges from 3ºC to 36ºC (37ºF to 97ºF), dissolved oxygen greater than 2 parts per million, salinity from 40 to 323 milliosmols per liter, and a pH of 9 up to 10 for short periods of time.[3,7,8,9] This species feeds primarily on a variety of aquatic invertebrates, but also small fish and detritus.[3]

Spawning: This species requires aquatic vegetation to provide substrate for egg attachment,[3] as well as thermal refuge within the summer, of which aquatic ditchgrass (*Ruppia maritima*) appears to be the preferred species.[2]

Reproduction: Mohave tui chubs spawn after 1 year of age.[2] Spawning season occurs from March or April when water is warm enough (64ºF),[2] and continues until as late as October.[3] Eggs adhere to aquatic vegetation after fertilization, and each female produces 4,000 to 50,000 eggs per season.[2] Eggs hatch after approximately 6 to 8 days when temperatures are between 18ºC and 20ºC (64ºF and 68ºF).[2]

Pressures and Stressors: Habitat degradation at both historical and suitable locations is a major pressure, which includes major dams segmenting populations and altering flow, predation from introduced species, competition with mosquitofish, and general urbanization further altering or displacing suitable habitat.[3] Excessive cattail (*Typha* spp.) recruitment at otherwise suitable sites can reduce depth, accumulate detritus, elevate water temperature, and worsen anoxic conditions.[3] Mohave tui chub are not adapted to flooding and may be replaced by species better equipped to survive in high water flow.[8] Hybridization with the arroyo chub (*Gila orcutti*), which was introduced to the Mojave River in the 1930s, has replaced genetically pure Mohave tui chub populations within almost the entirety of their native range.[10,11] Finally, disease has become a pressure for the Mohave tui chub, as the parasitic Asian tapeworm was found in Soda Springs and is shown to reduce growth but necessarily not survival rate.[12]

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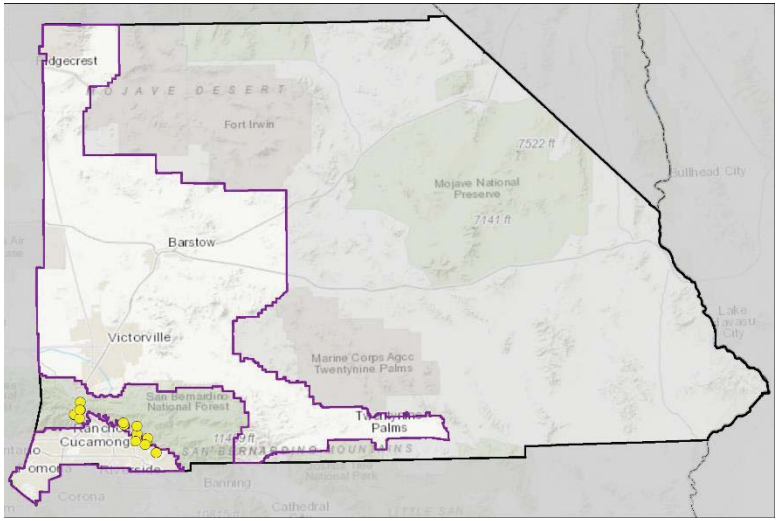
Legal Status

State: CDFW Species of Special Concern
Federal: None
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The Santa Ana speckled dace's range is limited to Southern California drainages, and historically occupied the upland portions of the Santa Ana, San Gabriel, and Los Angeles river systems within Los Angeles and Orange Counties.[1] Of their native range Santa Ana speckled dace are no longer present in the middle reaches of the Santa Ana River, Strawberry Creek, Mill Creek, and most of the Los Angeles River basin as well as the San Jacinto River basin.[2,3] Currently, distribution is limited to the headwaters of the Santa Ana and San Gabriel rivers, Indian Creek of the San Jacinto River headwaters, and additionally in Big Tujunga Creek of the Los Angeles River drainage.[2,4] Success of attempts to establish populations in the Santa Clara River, Cuyama River, and in River Springs, Mono County are largely unknown, but are thought to have failed within the Santa Clara River.[2,5,6]

RCIS Distribution: A total of 21 occurrences have been recorded in the County, including 9 records in the foothills of the Valley subarea on City Creek, Plunge Creek, and Mill Creek (see inset map).[7] In the Mountain region, the species is also known from upper reaches of Lytle Creek and Cajon Wash.

Seasonal Periods for Santa Ana Speckled Dace[2]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Spawning			✓	✓	✓							

Habitat Requirements: This species occurs in permanently flowing streams commonly fed by springs to keep summer temperatures between 17ºC and 20ºC (63ºF and 68ºF).[1] Santa Ana speckled dace typically inhabit shallow streams cobble and gravel riffles,[8] but have also been observed within runs and pools.[4] Average depths of 15–30 centimeters, overhanging riparian vegetation, and presence of other native fish such as the rainbow trout (*Oncorhynchus mykiss*) and Santa Ana sucker (*Catostomus santaanae*) are good indicators of suitable Santa Ana speckled dace habitat.[1,9]

Spawning: Spawning primarily occurs in shallow gravel areas on the edges of lake bodies or upstream in the edges of riffles or inlet streams.[2]

Reproduction: Generally, dace species reach maturity by their second summer, with females producing between 190 and 800 eggs,[10] with the Santa Ana speckled dace likely falling within the low end of this range given their relatively small size.[2] Spawning correlates with rising temperatures and high flow events, suggesting that spawning most likely occurs in March to May.[2] Dace species lay eggs underneath rocks or near gravel surface and adhere to substrate after fertilization.[11] At temperatures of 18ºC–19ºC (64ºF–66ºF), eggs hatch in 6 days but may remain in gravel for 7–8 days.[11]

Pressures and Stressors: Santa Ana speckled dace are threatened by dams and diversions that affect nearly all streams in which they occur, blocking movement of fishes, depleting flow, and burying suitable habitat when sediment is released.[2] Extensive channelization present in the middle and lower reaches of the Los Angeles, Santa Ana, and San Gabriel rivers result in water quality degradation and loss of suitable habitat.[2] The likelihood of catastrophic fire is relatively high in existing Santa Ana speckled dace habitat, and can increase erosion especially of fine sediments burying suitable substrate, exacerbate flood events and stream scour, and remove riparian vegetation affecting water temperature stability.[2] Alien plant and animal species such as giant reed (*Arundo donax*), brown trout (*Salmo trutta*), and red shiners (*Cyprinella lutrensis*) alter habitats and introduce additional predation and competition.[2]

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Santa Ana Sucker (*Catostomus santaanae*)

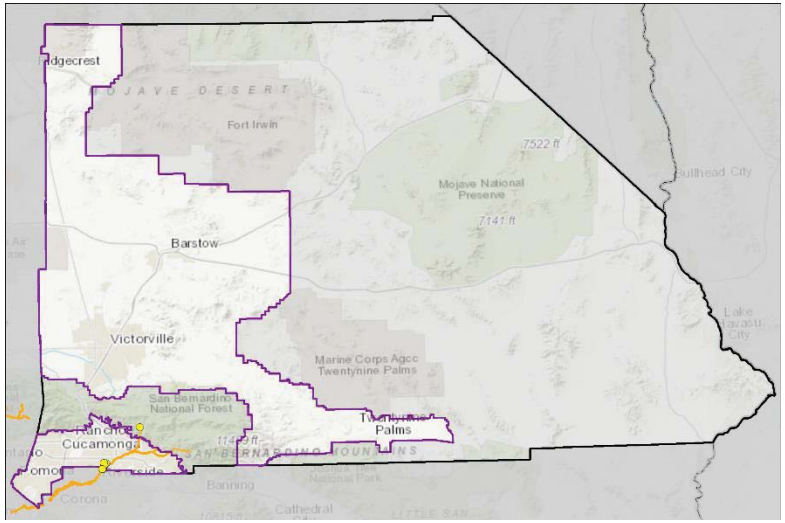
Legal Status

State: None

Federal: Threatened[1]

Critical Habitat: Originally designated on February 26, 2004[2]; USFWS issued revised critical habitat on December 14, 2010 (orange on inset map)[3]

Recovery Plan: Issued by the USFWS on February 2, 2017[4]



Distribution: The Santa Ana sucker is limited to rivers and streams in Southern California, and is endemic to the mainstems and tributaries of the Santa Ana, San Gabriel, and Los Angeles River watersheds.[4] The listing rule states that approximately 70% of historical range has been lost in the Santa Ana River, 75% in the San Gabriel River, and 80% in the Los Angeles River.[1] Current populations are confined to the lowlands of the Santa Ana River watershed spanning the 34 miles from La Cadena Drive bridge to State Route 90, the upper portions of the San Gabriel watershed restricted to the 26 miles above the San Gabriel dam in the West Fork, and approximately 13 miles of Big Tujunga Creek (tributary to Los Angeles River) between Hansen and Big Tujunga Dams as well as 2.2 miles of Haines Creek.[4] Populations in the Santa Clara River are presumed to be introduced and are not included as part of the range of the listed species.[1]

RCIS Distribution: In the Valley subarea, a total of 11 occurrences have been recorded along the Santa Ana River downstream (south) of Interstate 10 in the West Colton area (see inset map).[5] The species also occurs further downstream on the Santa Ana River in the Jurupa Valley of Riverside County.[6]

Seasonal Periods for Santa Ana Sucker[9]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Spawning			✓	✓	✓	✓	✓					

Habitat Requirements: This species is typically found in small to medium (less than 7 meters wide) permanent streams with flow ranging from slight to swift,[7] and is most abundant in cool, shallow areas with streamside vegetation to provide refuge during seasonal floods and subsequent repopulation.[8,9] Santa Ana sucker is associated with clear water and rocky substrates, but can tolerate seasonal turbidity and is occasionally be found in areas of sandy or muddy substrate.[7] Although this species seems to be generalized in their habitat requirements, they are unable to tolerate highly modified or polluted streams.[7] The Santa Ana sucker feeds primarily on algae, diatoms, and detritus found on coarser substrates, and as they grow in size, they diversify their diets to include aquatic insects.[10,11]

Spawning: Santa Ana suckers require riffles with gravel or small cobbles where fertilized eggs attach to the bottom substrate,[11] and are typically near areas of deeper water or aquatic vegetation that serve as a refuge.[12]

Reproduction: This species reaches reproductive maturity in the summer of their first year and spawn during their first and second years.[7] Santa Ana suckers are more fecund than other catostomids, with females producing between 4,400 and 16,000 eggs depending on size.[7] Spawning occurs between mid-March to early-July, peaking usually around April.[11]

Pressures and Stressors: Primary population pressures and stressors include hydrological modifications, diminished water quality, increased fire frequency, and introduced competition, and predation from exotic species.[6] Dams are prevalent throughout the Santa Ana sucker's historical and current distribution, and modify flow, transport of sediment, and restrict the dispersal of populations.[6] Water diversion, channelization, infrastructure construction, and general urbanization throughout the species range also degrade physical structure and water quality of otherwise suitable habitat altering temperatures, flow, and limiting coarse substrates which harbor algae and suitable spawning habitat.[6] Increased fire frequency throughout Southern California additionally has potential to eliminate riparian vegetation, increase erosion, and decrease habitat value overall.[6]

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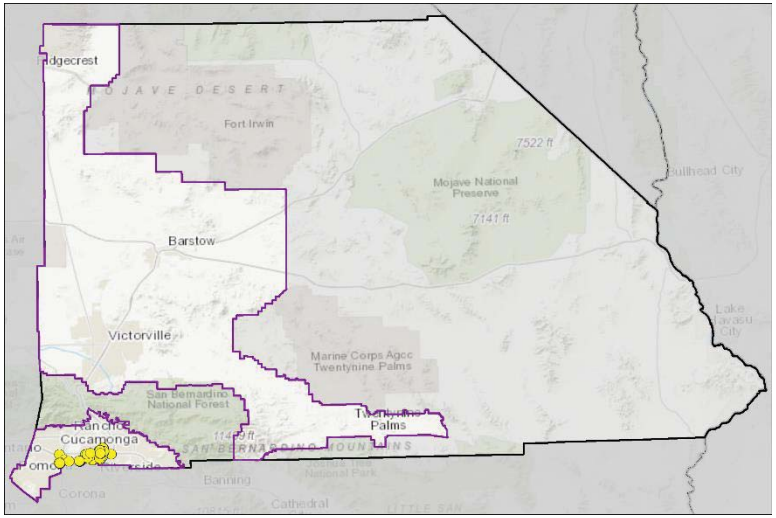
Legal Status

State: Not applicable
Federal: Endangered
Critical Habitat: Not applicable
Recovery Plan: Issued by the USFWS September 14, 1997[1]

Distribution: This species is endemic to the Colton Dunes in Riverside and San Bernardino counties, California. The Colton Dunes are the largest inland sand dune formations (excluding the deserts) in Southern California. At the Colton Dunes, this species occurs at 12 separate locations, originally estimated to cover approximately 450 acres,[1] which was later estimated in 2005 to cover approximately 900 acres of occupied suitable habitat.[2]

RCIS Distribution: A total of 119 occurrences have been recorded in the Valley subarea in the vicinity of West Colton, the Jurupa Hills, and eastern Ontario (see inset map).[3]



Habitat Requirements: This species is endemic to the Delhi soil series in the Colton Dunes. Suitable soils consist of fine and sandy substrates forming sand dunes stabilized by sparse vegetation.[1] The Delhi soil series includes very deep and somewhat excessively drained soils that are typically on floodplains, alluvial fans, and terraces.[4]

Foraging: Little to no information is available on the diet of this species; however, adults have been observed on occasion consuming nectar from buckwheat (*Eriogonum* spp.), croton (*Croton* spp.), and telegraph weed (*Heterotheca grandiflora*).[1]

Life Cycle: This species undergoes complete metamorphosis (egg, larva, pupa, and adult). The larval stage may last up to 2 years or longer, depending on environmental conditions, including food availability, temperature, rainfall, and other factors.[1]

Seasonal Periods for Delhi Sands Flower-Loving Fly[1]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Adult Flight *								✓	✓			
Egg, Larva, Pupa**	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* Adults are active above ground in late summer. ** Other stages can be found year round

Reproduction: Adults are active above ground in late summer. All other life cycles occur entirely underground and early stages of metamorphosis can be found year round. After mating the females lay eggs in the shade of shrubs and up to 5 centimeters (2 inches) below the surface of sandy soils. Larvae hatch from eggs around 11 to 12 days after laying. The larva and pupa stages of this species are specialized for burrowing as a result of body shape and specialized pupa head structures.[1]

Pressures and Stressors: Primary population pressures and stressors include habitat loss and degradation from urban development, agricultural conversion, sand mining operations, invasion of exotic plant species, off-road vehicles, dumping of manure and trash in suitable habitat, trampling or disruption of substrates, and the unauthorized collection of this species. More than 97% of this species' historic range containing suitable soils (Delhi soil series) has been converted to agriculture, urban/commercial development, or undergone other alterations that adversely affect this species. The invasion of exotic plant species alters soil moisture or otherwise makes soils unsuitable.[1]

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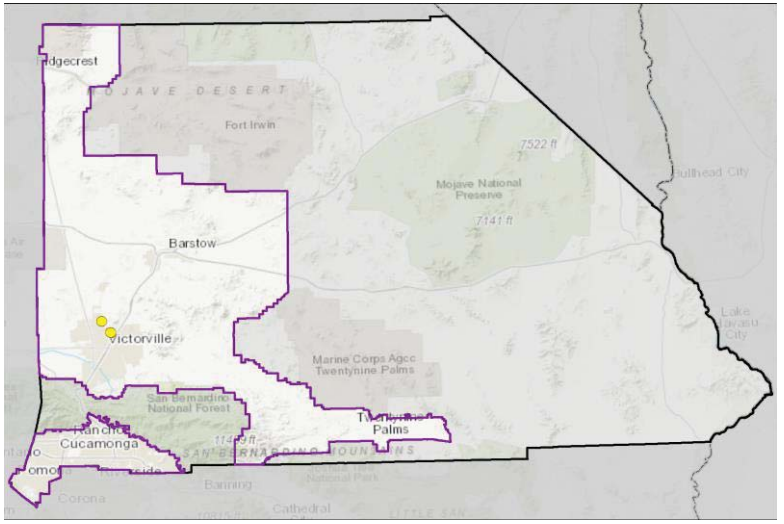
Legal Status

State: CDFW Special Animals List G1/S1 (Critically Imperiled)[1]
Federal: Not applicable
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: This species is non-migratory and known only from along the rocks and boulders besides the Mojave River in San Bernardino County.[2,3,4]
RCIS Distribution: A total of 2 occurrences have been recorded in the West Desert subarea, both along the Mojave River from Mojave Narrows downstream (north) to Oro Grande (see inset map).[5]

Habitat Requirements: The Victorville shoulderband is a terrestrial snail that found in rocky outcrops among leaves.[2,4] Terrestrial mollusks are dependent on ground litter and refugia (e.g., logs, snags, fallen branches, debris, thick leaf litter).[6] This species aestivates among and under loose rocks on dry hills.[2] Also occurs in rocky slopes of the mountains, generally on the lower slopes among the loose detritus in crevices, rockslides, etc.[4]
Breeding: Little is known regarding breeding habitat for this species. However, similar to other *Helminthoglypta* species, this species may emerge for reproduction after rainfall or periods of suitable precipitation.[7,8,9]
Foraging: Little is known regarding foraging prefers for this species. However, *Helminthoglypta* species forage on a variety of green, herbaceous vegetation, subsurface roots, fungi, and organic debris.[7]

Seasonal Periods for Victorville Shoulderband[7]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Reproduction*		✓	✓	✓	✓							
Dormancy*	✓					✓	✓	✓	✓	✓	✓	✓

* Reproduction likely occurs after rainfall and dormancy likely occurs in summer and winter. Seasonal periods estimated. Species likely spends less than half the year growing, reproducing, and dispersing.[7]

Reproduction: *Helminthoglypta* species are hermaphroditic (have both male and female organs).[7] Typically, gastropods engage in cross-fertilization but may demonstrate self-fertilization.[7] Little is known regarding the reproduction biology of this species. However, another coastal *Helminthoglypta* species has been known to emerge from aestivation within 24 hours after the first soaking October rains and begin mating.[7,8,9] Mating would occur during ambient temperatures of 10°C–15°C (50°F–59°F) at night or on overcast and rainy days.[7,8,9] Eggs of this coastal species are deposited in shallow holes in the soil below leaf litter and average 75.6 eggs per mass. Eggs hatch in March and April.[7,8,9] As a terrestrial mollusk, this species likely becomes dormant during summer and winter within suitable moist refugia and spends less than half the year growing, reproducing, and dispersing.[7]

Pressures and Stressors: Little is known regarding population pressures and stressors for this species. However, habitat loss and fragmentation of natural habitats due to clear-cut logging, road building, and altered fire regime have been attributed to the extinction of many mollusk species.[6,10] Highways also limit suitable dispersal opportunities for the species.[6] In addition, mollusks are sensitive to temperature and moisture extremes[6] and may be affected by activities generating environmental extremes (e.g., activities that change water regimes). This species' population may also be negatively affected by high-intensity fire burns with frequent fire-return intervals (<5 years).[6,7]

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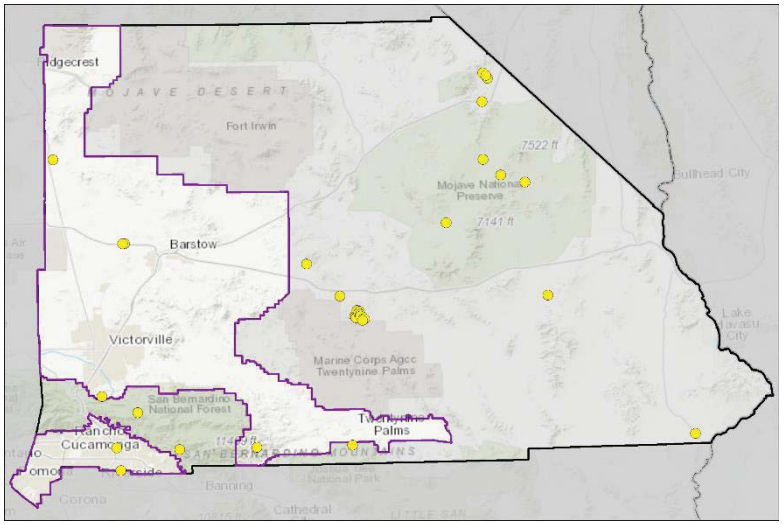
American Badger (*Taxidea taxus*)

Legal Status

State: CDFW Species of Special Concern; Fur-Bearing Mammal Provisions
Federal: None
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The American badger is distributed from southern Canada, including British Columbia, Alberta, Saskatchewan, Manitoba, and southern Ontario, over most of the northern, western, and central United States, down to Puebla and Baja California, Mexico.[1,2] Within the United States, they range from the Pacific Coast eastward through Ohio.[3] Historically, badgers ranged throughout California excluding the humid coastal forests of northwestern California, but have declined significantly over this range within the last 100 years.[3,4] They have been extirpated in many locations in Southern California, and persist in low numbers of the peripheral parts of the Central Valley and adjacent lowlands.[3]

RCIS Distribution: Species is known from just 5 occurrence records in West Desert subarea, from the Morongo Basin in the southeastern portion of the RCIS Area to north of Kramer Junction along Highway 395 (see map inset); however, the species is thought to be more widespread at low density throughout the desert and underreported in the database.[5]

Seasonal Periods for American Badger[8]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding							✓	✓				
Birth			✓	✓	✓	✓						

Habitat Requirements: The American badger can be found in a variety of environments, but it prefers dry grasslands, open forests, or mountain meadows.[3,6] Primary requirements are sufficient food, friable soils suitable for digging burrows, and open, uncultivated ground.[3]

Foraging: This species feeds primarily on fossorial rodents, usually captured by digging out burrows of prey.[3] Ground squirrels are an important prey item, as well as pocket gophers, kangaroo rats, prairie dogs, and mice.[7] When small mammals are scarce, badgers may also prey upon insects, scorpions, snakes, lizards, and birds.[7]

Reproduction: American badgers mate from mid to late summer and give birth from March to early June depending on location.[8] Litter sizes range from 2 to 5 offspring, averaging 3 per litter, and the young leave their family groups sometime in the fall.[8] All males were sexually mature as yearlings, while 30% of females bred in their first year in an Idaho study.[7]

Pressures and Stressors: Habitat loss, vehicle collisions, deliberate killing in agricultural settings, and decline of prey are the primary pressures and stressors to this species.[3,9,10,11] Cultivation of grasslands and intensification of agriculture limit suitable habitat for badgers and have caused population declines in various locations.[3,9,10,12] Fire suppression leading to infill of previously open woodlands and encroachment of forests onto grasslands additionally decrease and degrade American badger habitat.[10] Collisions with vehicles and deliberate killing is a significant source of mortality,[3,10,12,13] with trapping, shooting, or poisoning of badgers prompted by damage to livestock or cars that encounter burrows.[9] Finally, decreases in primary prey populations including prairie-dogs and ground squirrels seem to be directly related to badger population decline and pose a threat to long-term species viability.[11]

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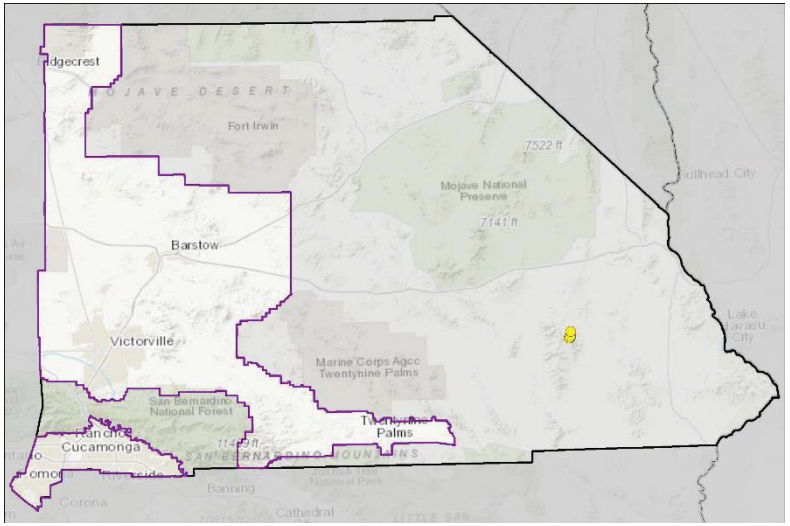
Desert Kit Fox (*Vulpes macrotis arsipus*)

Legal Status

State: Fur-Bearing Mammal Provisions
Federal: None
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The desert kit fox inhabits the southwestern deserts of California, southern Nevada, and lower elevation areas in western and southern Arizona, and northern Mexico.[1] The Tehachapi and Southern Sierra mountain ranges along the western boundary of its range form a physical barrier between desert kit fox and the federally listed San Joaquin kit fox (*Vulpes macrotis mutica*).[2]

RCIS Distribution: No occurrences of the species have been recorded in West Desert subarea likely because the species not considered rare or special status (see inset map); however, the species is thought to be more widespread at low density throughout the desert and underreported in the database.[3]

Habitat Requirements: Kit foxes occupy generally arid regions that receive less than around 16 inches of rain annually.[4] They are associated with desert scrub, alkali scrub, creosote brush scrub, creosote-white bursage desert scrub, and mixed salt desert scrub vegetation communities.[5,6,7] Ideal terrain is flat and open, but slopes up to 15% constitute fair habitat, and soils with sandy or loamy friable soils for burrowing are required.[7,8]

Hunting: Kit foxes are primarily carnivorous, feeding predominantly on black-tailed jackrabbits, desert cottontails, kangaroo rats, ground squirrels, but also occasionally other rodents, insects, reptiles, birds, bird eggs, and vegetation.[2]

Seasonal Periods for Desert Kit Fox[7,10]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding	✓	✓	✓	✓	✓							✓
Dispersal							✓	✓	✓			

Reproduction: Breeding season for desert kit fox is typically from December to late May, with gestation of approximately 49–56 days.[7,9] Most pups are born February through April, and litter sizes are 2–6 pups.[2,3,9] Young are weaned at about 4–5 months of age,[2] and they begin to disperse from their natal dens in late summer or early fall.[10]

Pressures and Stressors: Desert kit foxes face numerous pressures and stressors, including habitat loss and degradation, canine distemper, off-highway vehicle (OHV) use, vehicle collisions, and rodenticide poisoning.[7,11,12,13,14] Development in the Colorado and Mojave deserts of California is increasing, and growing urbanization leads to habitat fragmentation and degradation.[11,15] Canine distemper is a major threat to kit foxes and was found to be the cause of several deaths recorded at a solar energy project west of Blythe in 2011.[12] Although the origin of the outbreak is currently unknown, it is hypothesized to be introduced by domestic dogs or even native species such as badgers. This disease has the potential to cause dramatic population declines and was observed affecting populations in the late 1970s as well.[7] OHV use in desert areas have the potential to destroy burrows and dens, in addition to further compacting soils limiting future suitable den sites.[7] Desert kit foxes in urban areas are subject to vehicle collisions, which was found to be the main cause of mortality for San Joaquin kit foxes in a study near Bakersfield.[13] Vulnerability to rodenticide poisoning is an additional pressure on populations, with certain compounds lethal to kit foxes when administered directly.[14]

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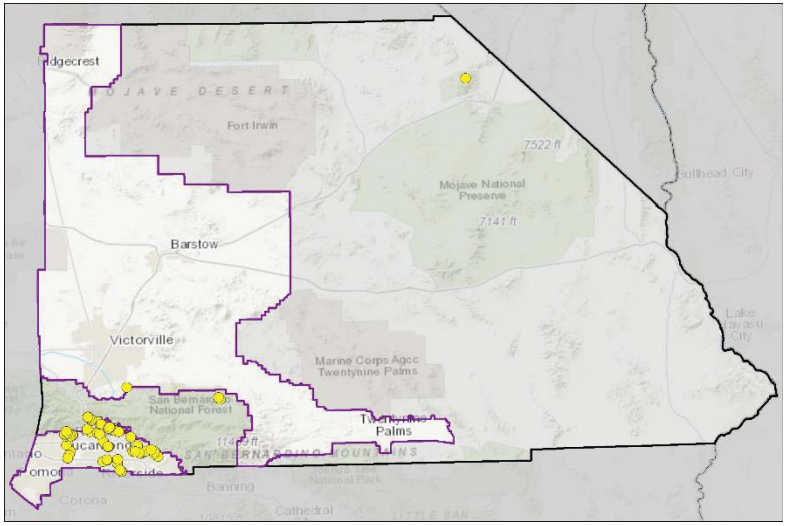
Legal Status

State: CDFW Species of Special Concern
Federal: Not applicable
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The Los Angeles pocket mouse occurs in coastal basins of Southern California and was historically distributed from Burbank and San Fernando in Los Angeles County, east to the city of San Bernardino in San Bernardino County, and southeast to the Aguanga area of Riverside County.[1,2,3] This species' current range does not include San Fernando Valley, but it does include a few scattered locations within San Bernardino, San Jacinto, and Temecula valleys.[3]

RCIS Distribution: A total of 53 occurrences have been recorded in the Valley subarea, particularly in the Upper Santa Ana River wash area, the wash areas around Lytle Creek and Cajon Wash, and in foothill areas around Rancho Cucamonga and Fontana (see map inset).[4]

Habitat Requirements: This subspecies is associated with lower elevation grassland, alluvial sage scrub, and coastal sage scrub.[3,5] Anecdotal evidence suggests that soil characteristics are more important for the Los Angeles pocket mouse than vegetation types, of which fine sandy soils are preferred and utilized for burrowing.[6,7]

Foraging: Pocket mice (*P. longimembris*) are primarily granivorous and likely specialize on grass seeds, but seasonally they eat forbs and occasionally arthropods and larvae.[3,6]

Seasonal Periods for Los Angeles Pocket Mouse[3,9]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Hibernation	✓	✓								✓	✓	✓
Breeding				✓	✓	✓	✓	✓	✓			

Reproduction: Timing and duration of activity is dependent on soil temperature, food availability, and ambient air temperature.[8] *P. longimembris* hibernates in the winter, generally from October to February,[3] and other studies of pocket mice species record breeding (pregnant females) from April to mid-September.[9] Laboratory studies of *P. longimembris* have recorded typical gestation periods of around 22–23 days,[10] and in the wild may produce 1 to 2 litters a year, typically with 3–4 pups.[6]

Pressures and Stressors: Serious pressures and stressors to the Los Angeles pocket mouse include habitat loss, degradation, and fragmentation from urbanization, agriculture, sand and gravel mining, and flood control operations.[3,6] Particularly, the loss of sandy loam soils through either development or altered natural flow regimes significantly limits the range of suitable habitat.[6] Increasing conversion from habitat to agricultural or urban uses is a growing pressure in San Bernardino and Riverside counties, particularly in the San Jacinto and Temecula valley floors.[3] Remaining populations are small and isolated, with many of the remaining habitat in Riverside County under private ownership,[3] and they are at increased risk of extirpation because of the inability for genetic exchange to occur between populations.[6]

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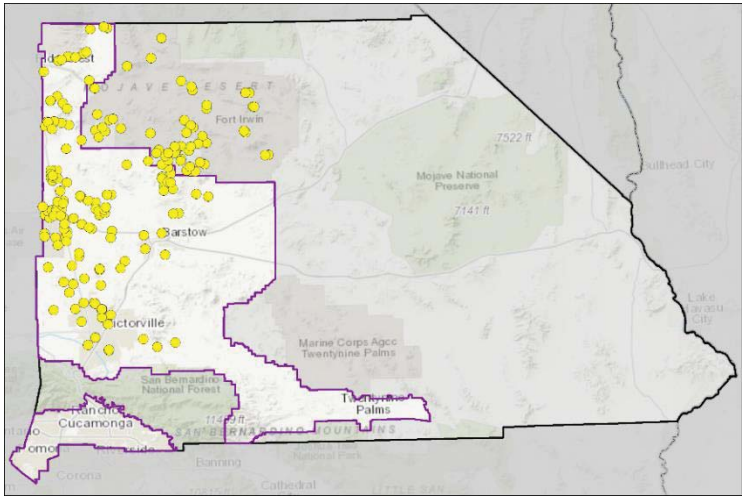
Legal Status

State: Threatened
Federal: BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The Mohave ground squirrel is endemic to California and occurs in the northwestern Mojave Desert within San Bernardino, Los Angeles, Kern, and Inyo counties.[1] Historically, the Mohave ground squirrel was distributed throughout the Mojave Desert bounded by the San Gabriel, Southern Sierra Nevada, and Tehachapi mountains to the south and west, Owens Lake to the northwest, the Granite and Avawatz mountains in the northeast, and on the southeast by the Mojave River.[2] Current populations are scattered and discontinuous,[3] and local extirpations are likely in the western Antelope Valley and Victorville areas.[4]

RCIS Distribution: A total of 115 occurrences have been recorded in the West Mojave subarea, particularly west and north of the Mojave River with key population centers identified on Edwards Air Force Base, around the Harper Dry Lake area, around Kramer Junction, and north along Highway 395 to Johannesburg, and around the Searles Lake area (see map inset).[5]

Seasonal Periods for Mohave Ground Squirrel[1,7]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding		✓	✓									
Aestivation							✓	✓	✓	✓		
Hibernation	✓	✓									✓	✓

Habitat Requirements: This species is associated with desert scrub, including saltbush scrub, desert sink scrub, desert greasewood scrub, shadscale scrub, Joshua tree woodland, Mojave mixed woody scrub, and found most often within creosote bush scrub.[1,3] The Mohave ground squirrel prefers open environments with relatively low vegetative cover and flat to moderately sloping terrain.[1] Soil characteristics are an important habitat feature since this species is fossorial and requires deep, alluvial sandy to gravelly soils suitable for constructing burrows.[1,6]

Foraging: Mohave ground squirrel feeds upon foliage, flowers, seeds, and fruits preferably with high water content, and is heavily reliant on seasonal availability of native shrubs particularly in drought years including spiny hopsage (*Grayia spinosa*), winterfat (*Krascheninnikovia lanata*), and saltbush (*Atriplex* spp.)[1,6,7]

Reproduction: Breeding season occurs from mid-February to mid-March, and gestation lasts around 30 days.[1] Litter sizes range between 4 and 9, and juveniles emerge from their natal burrows after 4 to 6 weeks.[1,7] Reproductive success is heavily dependent on the magnitude of fall and winter rains since forage availability determines whether individuals will choose to mate or preserve fat stores to periods of aestivation and hibernation.[7]

Pressures and Stressors: The primary threat to the Mohave ground squirrel is habitat loss and degradation, with additional pressures including drought and off-highway vehicles (OHV).[2,3,6,7] Urbanization, especially around the cities of Palmdale, Lancaster, and Victorville, has resulted in the loss of native desert scrub habitat and has accelerated in recent years along with other desert cities.[7] Proposed desert solar projects, agricultural development, and military operations also displace or degrade suitable habitat within the Mohave ground squirrel's range.[7] Indirect effects of development such as fragmentation, increased vehicle use, and abundance of domestic cats have the potential to lead to local extirpations and therefore reduced species resilience as a whole.[7] Prevalent drought limits reproductive success and can lead to local extirpations since individuals may choose not to mate for years at a time or may not survive dormancy periods with minimal fat stores.[1,3,7] OHV use is common within the species range and can collapse burrows, diminish shrub cover, and alter soil structure.[7,8]

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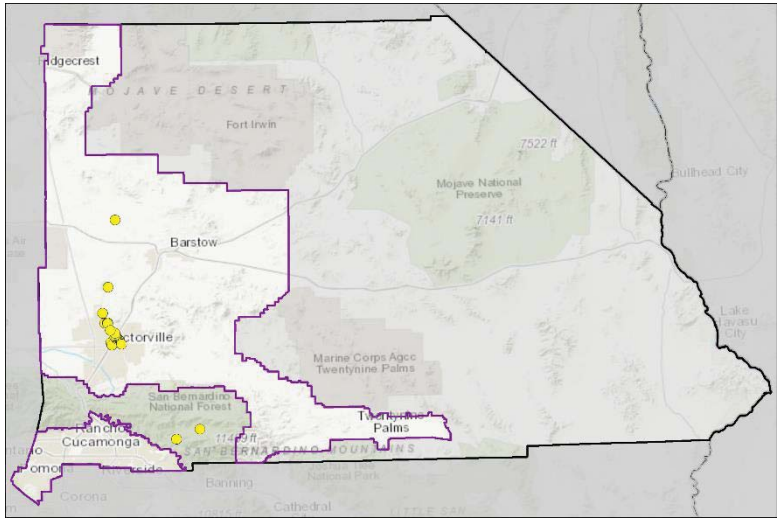
Mojave River Vole (*Microtus californicus mohavensis*)

Legal Status

State: CDFW Species of Special Concern
Federal: None
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The Mojave river vole only occurs in riparian habitats along the Mojave River in San Bernardino County, California.[1] This subspecies has been documented at elevations ranging from 2,020 feet at Harper Lake to about 2,700 feet at Mojave Narrow Regional Park.[2] Historically, California voles have been observed at Harper Lake, Edwards Air Force Base near Piute Ponds and Rogers Dry Lake, and China Lake Naval Air Weapons Station, but there were no confirmed records of this particular subspecies.[2,3] Current distribution is assumed to be restricted to the Mojave River between Victorville and Helendale, with the most current observations clustered in the Victorville and Oro Grande areas.[2,3]

RCIS Distribution: A total of 17 occurrences have been recorded in the West Desert subarea in the locations described above (see map inset).[4]

Seasonal Periods for Mojave River Vole[3]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding	✓	✓	✓	✓	✓	✓				✓	✓	✓

Habitat Requirements: Suitable habitat for the Mojave river vole is described as areas of herbaceous growth in wet bottomlands and includes meadows and freshwater marshes, but more often the ponds and irrigation features associated with the Mojave River.[3] This subspecies utilizes shallow burrows and requires friable, soft soils.[2,3] Given the narrow margin of riparian habitat transitioning to desert scrub in this arid region, this subspecies is restricted to the grassy or riparian zones within the Mojave River corridor.[5] This thin section of suitable habitat may be further constrained by development near the riparian belt.[5]

Foraging: California voles feed primarily on grasses, sedges, and forbs, while seeds and roots become an important source of food during the dry summers.[6]

Reproduction: Reproductive activity is dependent on external conditions, and correspond with periods of abundant food and vegetative cover.[3] As a result, the primary breeding period is concentrated in the wet season from February to March, although voles are capable of breeding year round.[5] The gestation period is around 21 days, and litter sizes range from 1 to 11 offspring.[7] Voles can be reproductive at 3 weeks of age for females and 6 weeks of age for males, with females exhibiting postpartum estrus able to have several successive litters as a result.[6]

Pressures and Stressors: Primary threats to the Mojave river vole are related to habitat availability and suitability, but they include negative alien species interactions as well.[3,5,8] Growing agricultural and urban development in the Victorville area alongside implementation of flood control with channelization is a direct threat resulting in habitat loss and restriction.[3] The historical Harper Lake population is presumed extirpated as a result of the marsh habitat drying up.[9] Invasive tamarisk (*Tamarix* spp.) outcompetes native vegetation and alters the composition of riparian communities.[3] Introduction of domestic cats and house mice (*Mus musculus*) introduce novel predation and competition that the Mojave river vole is not adapted to, which places additional pressure on populations.[3,5,10] Finally, voles naturally experience dramatic population fluctuations through their reproductive dependence on environmental factors, high litter sizes, postpartum estrus, and early sexual maturity, which further puts them at risk of local extirpations in their already disjunct and highly restricted range.[3,5]

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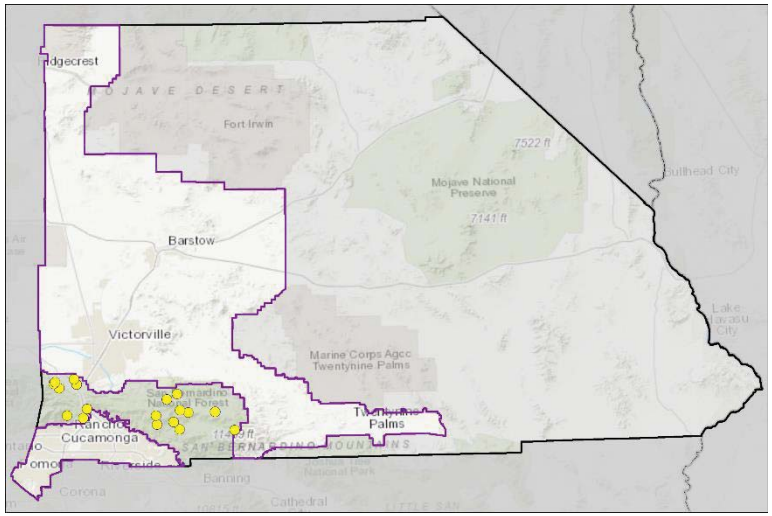
Mountain Lion (*Puma concolor*)

Subarea Focal Species: Valley

Legal Status

State: CDFW Non-Game Furbearer; CDFW Specially Protected Mammal
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: Mountain lions have the largest range of any terrestrial mammal in the Western Hemisphere and can be found from northern British Columbia through the United States, Central and South America, and to the southern tip of Chile.[1,2] Within the United States, their range is limited predominantly to relatively unpopulated regions in the west.[1] Mountain lions were eliminated from eastern North America within 200 years following European colonization,[3] with the last remaining populations restricted to southern Florida and the upper peninsula of Michigan.[4]

RCIS Distribution: No occurrences of the species have been recorded in Valley subarea (see inset map); however, the species is known to occur throughout the Mountain region and likely occurs throughout the Valley at low density and is underreported in the database.[5]

Seasonal Periods for Mountain Lion[1]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Litter (Cubs)				✓	✓	✓	✓	✓	✓			

Habitat Requirements: This species generally requires large tracts of land with minimal human disturbance, and occurs in a variety of environments, ranging from deserts to tropical rainforests and cold coniferous forests.[1] Although several studies show that habitats with dense understory vegetation is preferred,[6,7] mountain lions can occupy open habitats with very little vegetative cover as well.[3] In the Santa Ana and Santa Margarita mountains, mountain lions are most commonly located in coastal sage scrub, oak woodland, and riparian habitats.[8]

Hunting: Mountain lions require sufficient horizontal cover for stalking prey.[9] In North America they feed primarily on deer, but they may also prey upon birds, reptiles, and various other mammals.[9]

Reproduction: Females may come into estrus at any time of the year, but the majority of births occur in the warmer months from April to September.[1] Young are typically born in secluded areas among rocks or dense vegetation.[10] Litters vary in size from 1 to 6 cubs with an average of 2.4, and cubs remain with their mother until around 1.5 to 2 years of age.[1] Mountain lions reach sexual maturity at about 2 to 3 years of age, although first breeding is likely dependent on when females are able to establish territory.[11]

Pressures and Stressors: Mountain lions face threats from habitat loss, fragmentation, vehicle collisions, and decreased wild prey populations through poaching.[1] Large tracts of undeveloped suitable habitat with movement corridors and linkages are essential to the viability of apex predator populations in urbanizing landscapes, and they are increasingly constrained and bisected by development and transportation infrastructure.[11] In Southern California, the probability of mountain lion occurrence is zero in habitat blocks below 100 square kilometers.[12] Wide ranging carnivores are particularly susceptible to vehicle collisions, and roads are a significant source of mortality in the Santa Ana Mountains, with 32% of deaths observed caused by collisions.[6]

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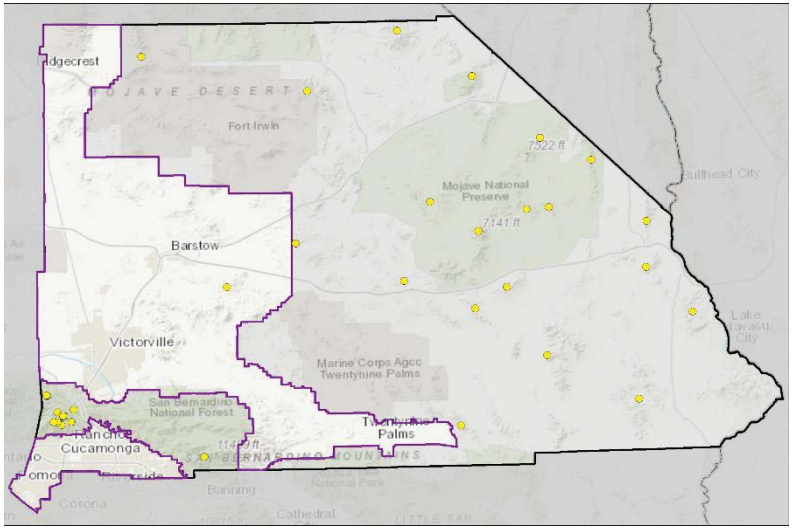
Legal Status

State: Fully Protected; Limited Hunting
Federal: USFS Sensitive; BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: Desert bighorn sheep inhabit desert mountain ranges within California, southern Nevada, southern Utah, southwestern Arizona, northwestern Mexico, and Baja California.[1] In California, this species is found in the White Mountains in Mono and Inyo counties, south to the San Bernardino Mountains, and further southeast to Mexico,[1,2] with an isolated population in the San Gabriel Mountains.[3] The Peninsular bighorn sheep, which is a Distinct Population Segment (DPS) of this species occurring from the San Jacinto and Santa Rosa ranges south into Mexico, is not addressed by the SBC RCIS.[4] Although desert bighorn sheep occur over a broad geographic area, populations within this range are scattered and discrete.[1]

RCIS Distribution: Just a single occurrence has been recorded in the West Desert subarea (see map inset); however, the species is thought to be more widespread at low density throughout the mountain ranges of the desert and underreported in the database.[5]

Seasonal Periods for Desert Bighorn Sheep[2,6]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding								✓	✓	✓	✓	
Lambing	✓	✓	✓	✓	✓	✓						✓

Habitat Requirements: This species is nomadic and wide-ranging, and it requires a variety of habitat characteristics related to topography, visibility, and resource availability.[4] Steep and rocky mountainous terrain that is visually open is preferred habitat for desert bighorn sheep, with steep, rugged terrain imperative for predator escape and lambing.[2,3,6] This species may occur in a variety of vegetation communities, including alpine dwarf scrub chaparral, chenopod scrub, Mojavean desert scrub, montane dwarf scrub, pinon and juniper woodland, and riparian woodland.[7]

Foraging: A wide array of resources is required to cope with drought-related variations in forage quality and availability.[6] Alluvial fans and washes support seasonal foraging, particularly important in summer to sustain lactating females.[2] Surface water is key especially in lambing season; however, adults can survive without consuming surface water.[2]

Reproduction: Outside of the typical breeding season from August to November, males and females commonly occupy different habitats.[7] Females prefer particularly steep slopes to protect their lambs,[6,8] while males tend to occupy less rugged terrain.[2] Diet quality and abundance can be highly variable in the desert region, and lambing season coincides with periods of most reliable forage availability.[2]

Pressures and Stressors: Desert bighorn sheep populations are pressured and stressed by loss and fragmentation of habitat, disease from livestock, predation, and drought.[2,6] Highways, fencing, and general urbanization limit and bisect suitable habitat, limiting species movement and genetic exchange essential for metapopulation resilience.[2] Domestic sheep and associated disease have likely been the largest factor in causing declines.[2,6] Considerable predation from mountain lions (*Puma concolor*) increases pressure on bighorn sheep populations, especially in areas where deer are absent.[2] Similarly, drought stresses bighorn sheep populations, which diminishes forage availability and reproductive success. In addition, climate change is expected to further exacerbate drought conditions and limit surface water availability for this species.[2,9]

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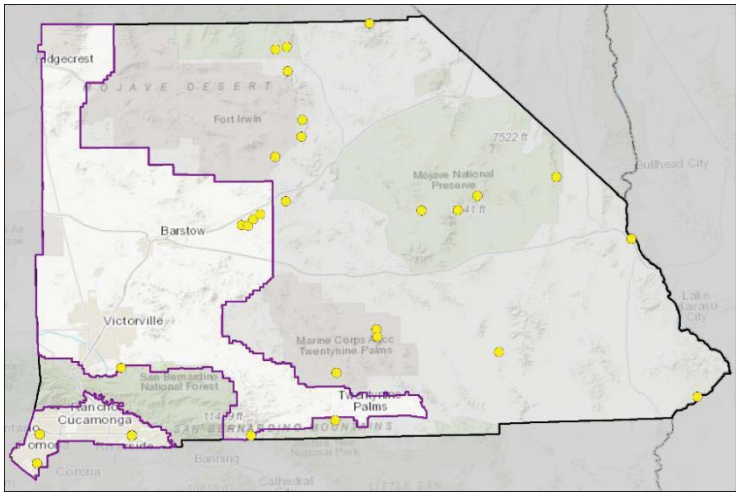
Pallid Bat (*Antrozous pallidus*)

Subarea Focal Species: West Desert

Legal Status

State: CDFW Species of Special Concern
Federal: BLM Sensitive; USFS Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The pallid bat is widely distributed within the western United States from southern British Columbia, Canada, to Baja California, Mexico.[1,2] This species occurs as far east as Kansas, Oklahoma, and Texas, and has been observed at elevations up to 8,000 feet.[1,2] Pallid bats occur throughout California, locally common in arid desert regions, and absent only from the higher elevations of the Sierra Nevada mountain range.[1,2,3]

RCIS Distribution: Species is known from just 5 occurrence records in the West Mojave subarea (see map inset); however, it is thought to be more widespread throughout the desert and underreported in the database.[4]

Habitat Requirements: This species occupies a variety of habitats including grasslands, shrublands, woodlands, and forests, but prefers open, dry habitats with rocky outcrops, cliffs, and crevices for roosting.[3] Although found throughout California, this species is frequently associated with desert areas and in particular the Sonoran Desert.[2,5]

Foraging: Pallid bats are primarily insectivores, able to forage in various habitats aside from developed or disturbed land.[2,6] They forage 0.5 to 2.5 meters (1.6 to 8.2 feet) above the ground and may capture prey aerially, by gleaning from plants, or taking insects crawling along the ground surface.[3,7]

Seasonal Periods for Pallid Bat[2,3]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding	✓	✓								✓	✓	✓
Maternity Roosts				✓	✓	✓	✓					
Hibernation	✓	✓	✓	✓								✓

Roosting: Suitable day roosts are typically warm with a stable temperature range but must protect against temperature extremes.[3,5,7] Day roosting sites commonly include caves, crevices, bridges, mines, and occasionally hollow trees and buildings.[2,5,8,9] Night roosts may be in more open areas with easy access since they are used for the consumption of prey and to enter night torpor, and commonly include shallow caves, cliff overhangs, cracks, crevices, and trees and snags.[3,6]

Reproduction: Pallid bats mate from October to February.[2,3] Females store sperm and delay fertilization until later in winter, with gestation approximately 9 weeks long and the majority of births occurring May through June.[2] Litters commonly consist of two young, and pups reach adult flight capability and adult weight from 49 to 56 days of age.[2] Nursery colonies form in early spring, and males may either roost separately or within the nursery colony.[3]

Pressures and Stressors: Growing urbanization, loss of roosting and foraging habitat, and large-scale wind energy pose threats to pallid bat populations.[2,4,10] Pallid bats are highly vulnerable to disturbance at roost sites as a colonial species with considerable roost loyalty, and are subject to vandalism, extermination, and general human activity at or near the roost.[2,11] Although this species can coexist with humans in rural environments, dramatic population declines are associated with highly developed areas such as the south coast region of California, and suggest intolerance to urbanization.[4,12] Conversion to agriculture, timber harvesting, prescribed fires, and pesticides limit forage habitat quality and food availability.[4] Significant bat mortality has been observed at wind energy facilities, and pallid bats specifically may be sensitive to strikes during emergence from roosts or during juvenile dispersal.[7,10]

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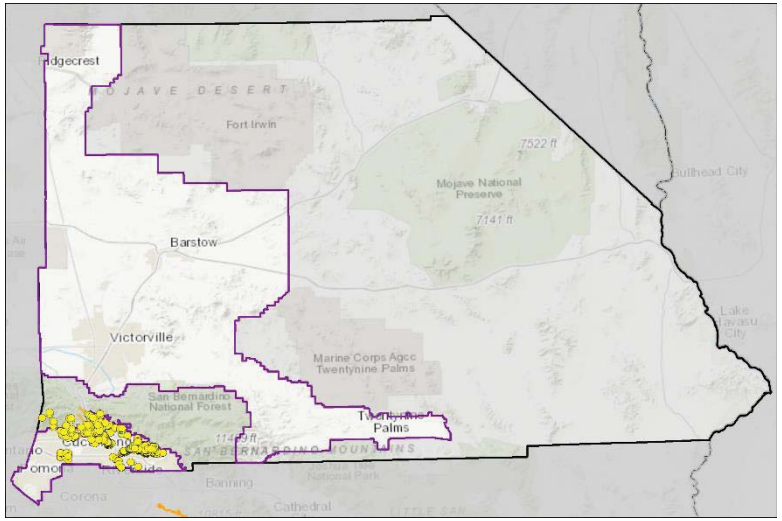
Legal Status

State: CDFW Species of Special Concern
Federal: Endangered[1]
Critical Habitat: Originally designated on April 23, 2002[2]; USFWS issued revised critical habitat on October 17, 2008[3]
Recovery Plan: Not applicable



Distribution: The San Bernardino kangaroo rat is found within alluvial floodplain habitat, historically encompassing the alluvial fan terraces at the bases of the San Gabriel, San Bernardino, and San Jacinto mountain ranges in San Bernardino and Riverside counties, California.[4] The historical range of the San Bernardino kangaroo rat has been reduced by approximately 95% due to agricultural, urban, and industrial development.[1] Current populations are confined to the upper reaches of the Santa Ana River from the confluence of Mill Creek and the Santa Ana River, discrete locations within Lytle and Cajon Creek washes upstream of Interstate 15, and along the upper reaches of the San Jacinto River and in Bautista Creek.[4]

RCIS Distribution: A total of 1,158 occurrences have been recorded in the Valley subarea, particularly in the Upper Santa Ana River wash area, the wash areas around Lytle Creek and Cajon Wash, Reche Canyon, San Timeteo Canyon, and in foothill areas around Rancho Cucamonga and Fontana (see map inset); however, the occurrence dataset for this species likely includes duplicate records and records from multiple survey years in the same location.[5]

Breeding Periods for San Bernardino Kangaroo Rat[4]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Habitat Requirements: The San Bernardino kangaroo rat inhabits Riversidean alluvial fan sage scrub, which provides the food resources and suitable sandy, loamy, or gravelly soils for building the shallow burrows in which they reside.[1,3] Alluvial fans are dynamic environments subject to periodic flooding, and as a result of subsequent erosion and scour comprises of pioneer, intermediate, and mature successional phases.[6] Pioneer and intermediate sage scrub is less dense and contains looser soils,[7] making them the preferred habitat for this species, while mature sage scrub is more rarely occupied.[3] During flood events, burrows within the flow path are destroyed and survival is dependent on populations within different zones of successional alluvial fan sage scrub, requiring all three successional phases for long-term species viability.[3,4]

Foraging: Seeds are the primary food source, but green vegetation and various insects are important seasonal food and water sources.[4]

Reproduction: Reproductive activities peak in June and July, although observed pregnant or lactating females between January and November and observed males in reproductive condition between January and August suggest a prolonged breeding season.[4] Females are capable of having more than one litter in a year, and average between two and three young per litter.[4] Reproduction appears to coincide with high food availability, and population growth is limited by small litters size, long intervals between litters, and the tendency to promote self-survival over reproduction.[4,8]

Pressures and Stressors: Major pressures and stressors to remaining San Bernardino kangaroo rat populations include habitat loss and degradation due to aggregate mining, flood control projects, urbanization, and off-highway vehicle (OHV) activity.[4] These pressures displace and fragment suitable habitat, compact soils, and alter natural flow regime with associated soil structure and plant succession patterns.[4] Additionally, the small population size and highly fragmented nature of extant populations lend this species to higher risk of extirpation through localized events and exacerbate loss of genetic variation.[4]

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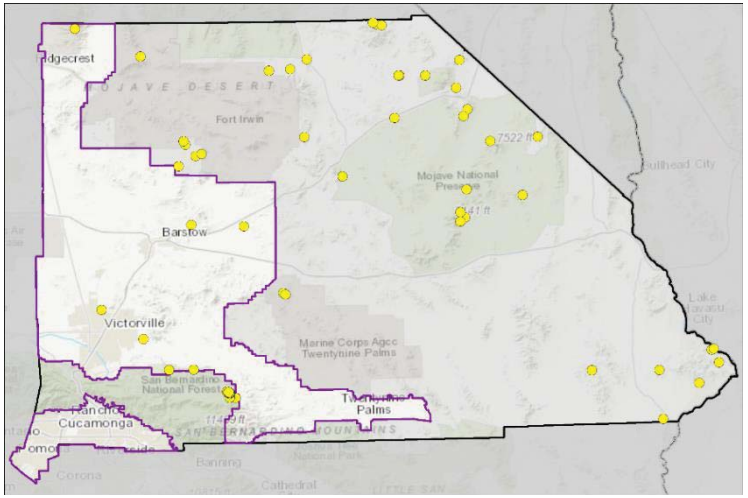
Legal Status

State: CDFW Species of Special Concern
Federal: BLM Sensitive; USFS Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: Townsend's big-eared bat occupies a continuous range within the western and central United States from southern British Columbia, Canada to central Mexico, extending east into parts of South Dakota, Nebraska, Kansas, Oklahoma, and Texas.[1,2] Five distinct subspecies occur and overlap within the confines of this general range, and subspecies *C. t. townsendii* and *C. t. pallescens* both occur in the western United States.[3] This species can be found throughout California, aside from the alpine and subalpine areas of the Sierra Nevada mountain range.[4,5]

RCIS Distribution: Species is known from just 7 occurrence records in the West Mojave subarea (see map inset); however, it is thought to be more widespread throughout the desert and underreported in the database.[6]

Habitat Requirements: This species occupies a variety of habitats including inland desert, coastal redwood forest, riparian, and oak woodland, as well as coniferous and deciduous forests, although primarily associated with mesic habitats and distribution heavily reliant on suitable roosting habitat.[1,7]

Foraging: Moths make up a majority of the diet, while beetles and other soft-bodied insects may also be taken.[3] This species utilizes the canopy and mid-canopy of forests, woodlands, riparian zones, and sagebrush shrubsteppe for foraging.[8]

Seasonal Periods for Townsend's Big-Eared Bat[3,5]

	Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
Breeding	✓	✓								✓	✓	✓
Maternity Roosts					✓	✓	✓					
Hibernation	✓	✓	✓	✓						✓	✓	✓

Roosting: Townsend's big-eared bat prefers to roost in caves, mines, and shafts, but can also be found to a lesser extent roosting in buildings, bridges, rock crevices, and hollow trees.[5] Unlike other cave-dwelling bats, this species commonly roosts in open areas, often hanging from walls and ceilings.[3] This species has fairly strict temperature requirements for roosting sites, with maternity colonies using relatively warmer sites from 19ºC to 30ºC (66ºF to 86ºF), and hibernation necessitating much colder sites preferably below 10ºC (50ºF).[3,9]

Reproduction: Mating is concentrated in November to February, and females delay fertilization until after hibernation.[3] Females gather in the spring at nursery sites and give birth to one pup between May and July.[3,5] These nursery colonies persist until young become independent in late summer or early fall.[5] Many if not all surviving female yearlings will return to the same nursery roost in the following year.[5] Periods of torpor and hibernation extend from early fall to early spring, with individuals commonly awaking to change position with a hibernaculum or moving to another roost entirely.[3,10]

Pressures and Stressors: Townsend's big-eared bats are primarily pressured and stressed by disturbance, but they are also adversely affected by loss of roost and foraging habitat as well as potentially by large wind energy projects.[3,7] This species is highly sensitive to human disturbance and may abandon maternity or hibernation roost sites after just one disturbance event.[1,3,4] In California, all known nursery colonies in limestone caves have been abandoned, and numbers have significantly declined across the state with a 52% loss in number of maternity colonies and a 45% decline in number of available roosts.[3,7] Human activity at roosts, closure of old mines, renewed mining, and development or conversion to agriculture in foraging habitat all limit and degrade possible roost and foraging sites.[7] Large-scale wind energy operations are known to be the source of significant bat mortality and may further stress populations especially if located in close proximity to roosting sites.[11]

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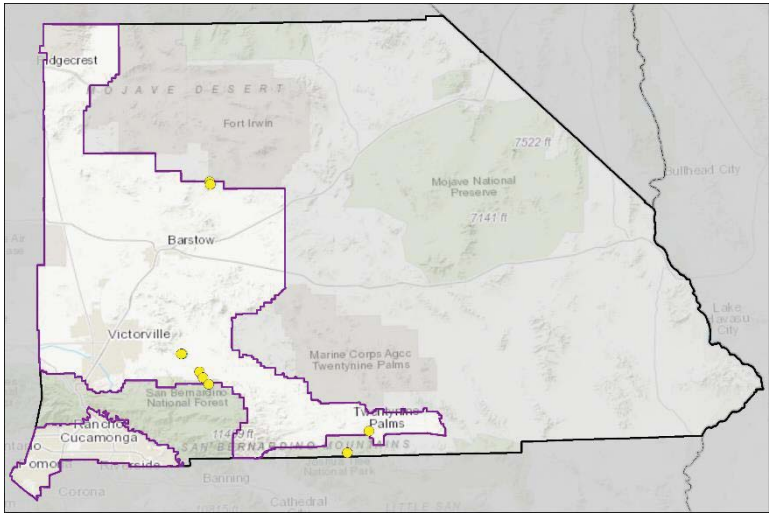
Alkali Mariposa Lily (*Calochortus striatus*)

Legal Status

State: None; CRPR 1B.2*
Federal: BLM Sensitive; USFS Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: This species is found in moist, alkaline areas of the arid interior within Southern California and western Nevada.[1,2] Within Southern California, alkali mariposa lily occurs in the southern Sierra Nevada, in the western, central and southern Mojave Desert, at the north base of the San Bernardino Mountains, and in the southern San Joaquin Valley.[2,3] Observations are scattered within San Bernardino, Tulare, Kern, and Los Angeles counties and at elevations ranging from 70 to 1,595 meters (230 to 5,233 feet).[4]

RCIS Distribution: A total of 7 occurrences have been recorded scattered throughout the West Desert subarea, including at Box Springs in Rabbit Springs the Lucerne Valley, Whiskey Springs and Cushenbury Springs in the San Bernardino Mountain foothills, Paradise Springs northeast of Barstow, and near Twentynine Palms in the Morongo Basin (see map inset).[5]

Blooming Periods for Alkali Mariposa Lily[4]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
			✓	✓	✓						

Habitat Requirements: Alkali mariposa lily grows in mesic, alkaline conditions, and is found within seasonally moist habitats including alkaline meadows and seeps, ephemeral washes, and vernally moist depressions.[2,4,6] This species typically requires sandy, calcareous substrates, and is associated with chaparral, chenopod scrub, and Mojavean desert scrub.[2,4,6] Observations made on Edwards Air Force base suggest that this species prefers drainages in halophytic saltbush scrub as well as claypans and sand dunes. In addition, observations suggest periodic natural inundation is important to growth.[7]

Reproduction: This species is a perennial herb arising from an underground bulb.[3,4] Alkali mariposa lily blooms from April to June and has perfect flowers that contain both male and female reproductive parts.[2,4] Pollinators include flies and bees, and it is unknown whether reproduction primarily occurs through seed establishment or bulb divison.[2]

Pressures and Stressors: Pressures and stressors to alkali mariposa lily include urbanization, road construction, grazing, trampling, and hydrologic alterations.[2,4] The most significant pressure to this species is the lowering of water tables, which alters the seasonally moist alkaline habitat on which this species relies.[2,4] Growing urbanization and development in the City of Lancaster exerts a direct pressure to this species as the largest concentration of populations is centered around this area.[2,6] Trampling and grazing from livestock may diminish reproductive capacity, alter soils, and reduce plant vigor.[2] Populations of alkali mariposa lily have been extirpated at Whiskey Springs, Cushenbury Springs, and Radio Tower Meadow due to road construction, spring flow diversion, and general development, respectively.[2]

* California Rare Plant Rank **1B:** Rare, threatened, or endangered in California and elsewhere; **0.2:** Moderately threatened in California.

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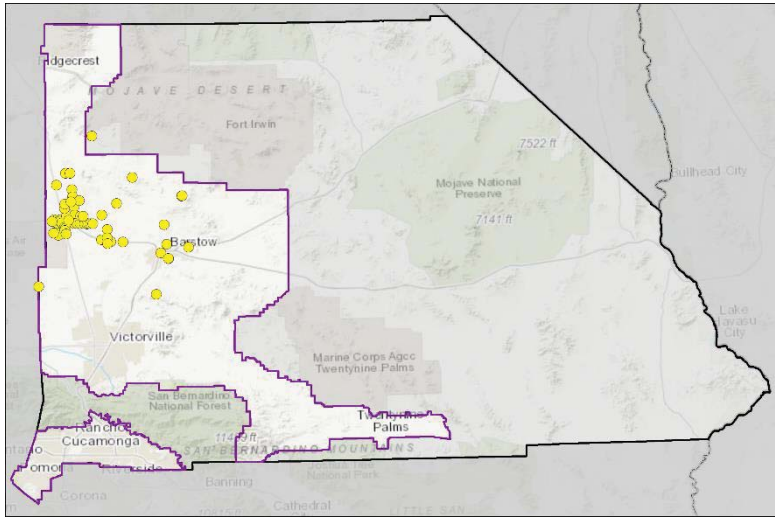
Barstow Woolly Sunflower (*Eriophyllum mohavense*)

Legal Status

State: None; CRPR 1B.2*
Federal: BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: Barstow woolly sunflower is endemic to the west-central Mojave Desert in California.[1,2] Historical and recent occurrences span Los Angeles, Kern, San Bernardino, and Fresno counties, but current distribution is generally bounded in the east by Camp Irwin Road and Interstate 15, west to Buckhorn Butte on Edwards Air Force Base, and north to Almond Mountain.[3,4] This species occurs at elevations from 500 to 960 meters (1,640 to 3,150 feet).[5]

RCIS Distribution: A total of 56 occurrences have been recorded in the West Desert subarea, particularly around the Kramer Junction area and east toward Barstow (see inset map).[6]

Habitat Requirements: Barstow woolly sunflower occurs in Mojavean desert scrub, creosote bush scrub, chenopod scrub, and desert playas.[3] It is commonly associated with Mojave spineflower (*Chorizanthe spinosa*) and yellow peppergrass (*Lepidium flavum*).[4] Open, flat, and barren sites with sandy or rocky soils are typically required. Preferred habitat includes the margins of alkali sinks and depressions distributed among saltbush or creosote bush scrub.[4,7]

Blooming Periods for Barstow Woolly Sunflower[1,5]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
		✓	✓	✓							

Reproduction: This species is a very small, 1–2.5-centimeter (0.5–1.5-inch), annual herb that flowers from March or April till May.[1,5] Spring emergence and growth is thought to be highly dependent on average winter and spring precipitation, and suggests wide population fluctuations based on environmental conditions.[4] High site-specific recurrence from year to year implies limited dispersal distances.[4] Common pollinators, seed dispersal, and other aspects of population ecology for this species is currently unknown.[4]

Pressures and Stressors: Primary pressures and stressors to Barstow woolly sunflower include livestock grazing and trampling, road construction, energy development, off-highway vehicles, and urban sprawl.[2,4,5] Most of the areas in which this species is found are available for sheep grazing, the majority of which is concentrated in the spring during important periods of flowering and seed production.[4] Negative impacts from sheep and other livestock are likely more from trampling and altered soil structure than grazing.[4] Several populations of Barstow woolly sunflower may be extirpated due to the pressures and stressors mentioned, although their status has not recently been updated.[2,3,4]

* California Rare Plant Rank **1B:** Rare, threatened, or endangered in California and elsewhere; **0.2:** Moderately threatened in California.

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Gambel's Water Cress (*Nasturtium gambelii*)

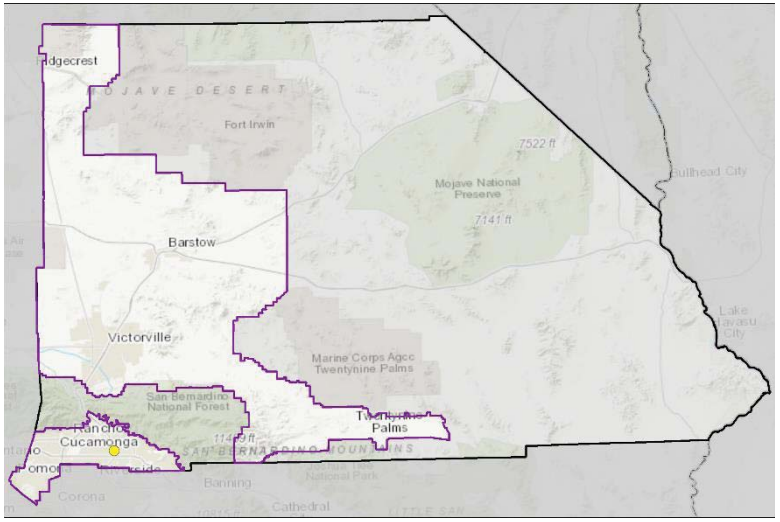
Legal Status

State: Threatened; CRPR 1B.1*

Federal: Endangered[1]

Critical Habitat: Not applicable

Recovery Plan: Issued by USFWS on September 28, 1998[2]



Distribution: Gambel's water cress historically occurred in wetlands of Central and Southern California, within Orange, San Bernardino, Los Angeles, Santa Barbara, and San Luis Obispo counties.[3,4] At the time of listing, there were only three known populations at Black Lake Canyon, Oso Flaco Lake, and Little Oso Flaco Lake within San Luis Obispo County, but these sites no longer contain pure *Nasturtium gambelii* since they have since hybridized with *N. officinale*.[4] The only remaining wild population, discovered in 1996, occurs on Vandenberg Air Force Base in Santa Barbara County.[4] A population was introduced at Guadalupe-Nipomo Dunes National Wildlife Refuge in 2008 in San Luis Obispo County.[4]

RCIS Distribution: One occurrence has been recorded in the Valley subarea at a location referred to as Urbita Hot Springs; however, this location is considered extirpated (see map inset).[5]

Blooming Periods for Gambel's Water Cress[3,4,7]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
			✓	✓	✓	✓	✓	✓	✓		

Habitat Requirements: Gambel's water cress grows in marshes, swamps, and other mesic environments both freshwater and brackish.[3,6,7] Little is known about specific habitat requirements of this species, but it has been found on the margins on lakes and slow-moving streams, both in saturated and semi-saturated soils, and with or without surface water.[3] This species seems to prefer cleared areas where it does not have to compete with other plant species for resources.[2,3]

Reproduction: This species is a perennial rhizomatous herb that produces white, dense inflorescences blooming generally from April to July, but may not flower until October as observed in a greenhouse setting.[3,4,7] This species appears to self-pollinate readily.[3] Very little is known about seed germination and dispersal, seed recruitment, and common pollinators.[3]

Pressures and Stressors: This species is pressured by a variety of factors including habitat loss and degradation, hydrologic alterations, small population size, and competition.[3,4,7] Development of wetlands has occurred at a rapid rate since the early part of the 20th century and has significantly limited suitable habitat for this species. Indirect effects of development also degrades potential suitable habitat through increased sedimentation, erosion, nutrient runoff, and a lowered water table.[3,4] In particular, increased nutrient loads aid the excessive growth of additional vegetation that place additional pressure on Gambel's water cress, which prefers habitats with minimal competition for resources.[4] Such small population sizes put this species at a considerably high risk of stochastic extirpation or extinction, and may also lead to inbreeding depression reducing overall genetic resiliency.[4]

* California Rare Plant Rank (CRPR) **1B:** Rare, threatened, or endangered in California and elsewhere; **0.1:** Seriously threatened in California.

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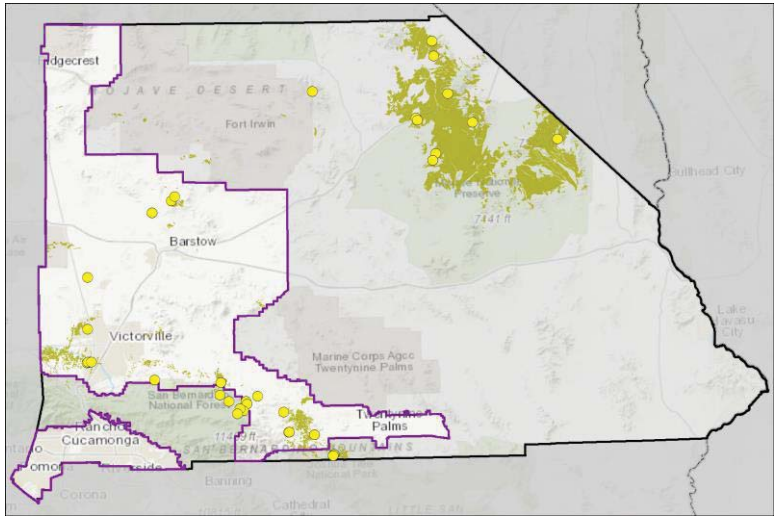
Legal Status

State: None
Federal: None
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: Joshua trees are distributed in desert areas within Southern California, southern Nevada, western Arizona, and in southwestern Utah.[1] Within California they occur in the Mojave Desert, the eastern slope of the Sierra Nevada range, and in parts of the Tehachapi Mountains.[1] Throughout its California range, this species can be found from elevations of 1,600 to 6,600 feet.[1,2]

RCIS Distribution: A total of 16 occurrences have been recorded in the West Desert Subarea; however, the species is not considered rare or special status and therefore is likely underreported in the database. Joshua tree woodland vegetation mapping is shown in green on inset map, which provides a better idea of the species distribution, including areas near Phelan, Lucerne Valley, and the Morongo Basin (see map inset).[3]

Blooming Periods for Joshua Tree[2,4]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
		✓	✓	✓							

Habitat Requirements: Joshua trees occur in hot, dry flats, mesas, bajadas, and gentle slopes in desert transitional zones containing sagebrush, desert shrub, pinyon-juniper, and desert grassland vegetation.[2,4,5] This species can persist in habitats with cold winters, hot summers, and very little precipitation,[2] and some research suggest that this species is restricted to areas with cold enough winter temperatures.[5] Plants are capable of tolerating temperatures from 12ºF to 140ºF and annual precipitation from 3.9 to 10.6 inches.[6] Soils are typically fine, loose, well drained, or gravelly.[2,5] Perennial grasses are often dominant in Joshua tree stands, and depending on location commonly include desert needlegrass (*Achnatherum speciosum*), Indian ricegrass (*A. hymenoides*), big galleta (*Pleuraphis rigida*), black grama (*Bouteloua eriopoda*), while galleta (*P. jamesii*), and blue grama (*B. gracilis*).[2]

Reproduction: This species is a slow-growing and long-lived tree-like plant that flowers throughout its range between March and May.[1,2,4] Reproduction can be sexual through seed production or asexual through rhizomatous growth.[2] Two species of moths, *Tegetticula synthetica* and *Tegeticula anthithetica*, are considered sole pollinators of Joshua trees.[7] Seeds are chiefly dispersed by seed caching rodent species, but wind may also play a less significant role in dispersal.[5,8,9] Seed production is considered rare and is likely correlated with years of higher precipitation.[2]

Pressures and Stressors: Primary pressures and stressors to Joshua trees include increased fire frequency and intensity, drought, slow recruitment, and climate change.[2,10,11,12] The short seed longevity, variable germination conditions, and infrequent establishment of Joshua trees make them more vulnerable to large disturbances as it may require decades or centuries to fully reestablish an area.[10] Anthropogenic factors are causing wildfire size and frequency to increase in the Mojave Desert where habitats are generally intolerant of fire, and threaten long-term successional Joshua tree woodland reestablishment.[11] Accentuated El Niño Southern Oscillation cycles prolong periods of drought but introduce short periods of heavy rain in which exotic species flourish, become fuels for higher intensity wildfires, and ultimately limit opportunities for Joshua tree recruitment and persistence.[12] Finally, climate change increasing temperatures and altering precipitation seasonality and magnitude has the potential to dramatically limit future distribution of Joshua trees, particularly in the southern portion of its range.[13]

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Lane Mountain Milk-Vetch (*Astragalus jaegerianus*)

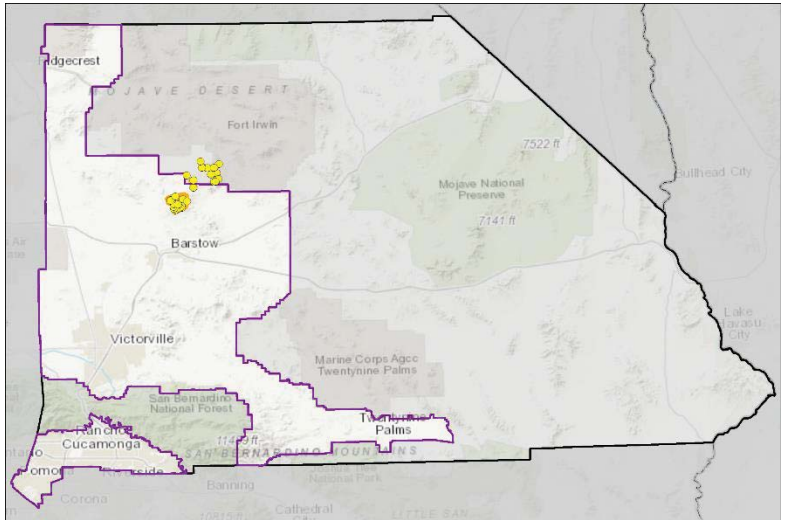
Legal Status

State: None; CRPR 1B.1*

Federal: Endangered[1]

Critical Habitat: Originally designated on April 8, 2005;[2] USFWS issued revised critical habitat on May 19, 2011 (orange on inset map)[3]

Recovery Plan: Not applicable



Distribution: Lane Mountain milk-vetch is restricted to a small area within the central Mojave Desert in San Bernardino County, California.[4,5] This species occurs at elevations of 900–1,200 meters (2,953–3,937 feet).[6] The four known populations are grouped linearly along a 20-mile axis north of Barstow and include the Montana-Brinkman, Goldstone, Paradise, and Coolgardie populations.[7,8] The Montana-Brinkman, Goldstone, and Paradise populations occur within Fort Irwin, while the Coolgardie population is located just south of the army base.[6,7] The four areas where this species is found comprises approximately 21,400 acres.[7]

RCIS Distribution: A total of 14 occurrences have been recorded in the West Desert subarea in the Coolgardie Mesa area north of Barstow (see inset map).[9]

Blooming Periods for Lane Mountain Milk-Vetch[7]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
		✓	✓	✓							

Habitat Requirements: This species occurs in Mojavean desert scrub and Mojave mixed woody scrub with widely scattered Joshua trees (*Yucca brevifolia*).[6,7,10] Suitable soils are shallow, rocky, and coarse sandy decomposed granite, and the species is commonly found on rocky low hills and low ridges above alluvial fan drainages.[11] Lane Mountain milk-vetch typically utilizes host or nurse shrubs, presumably for structural support, protection from herbivores, and attenuation from weather extremes in exchange for nitrogen fixation in the soil.[11,12] The most common host plants include turpentine broom (*Thamnosma montana*), white bursage (*Ambrosia dumosa*), Eastern Mojave buckwheat (*Eriogonum fasciculatum* ssp. *polifolium*), Cooper's goldenbush (*Ericameria cooperi*), and Nevada jointfir (*Ephedra nevadensis*).[7]

Reproduction: Lane Mountain milk-vetch is a herbaceous perennial that flowers from March to May.[7] Primary pollinators include megachilid bees (*Anthidium dammersi*, *A. emarginatum*, and *Osmia latisculata*).[8,12] In dry years, plants may desiccate before setting seed or abort flowers altogether, suggesting successful reproduction is reliant on sufficient rainfall.[12]

Pressures and Stressors: Pressures and stressors to Lane Mountain milk-vetch include potential energy development, non-native species competition, loss of nurse shrubs from increased fire frequency, reduced gene flow between populations, mining, off-highway vehicle use, and military activities.[8,11,12] Military operations expanded further into territory occupied by this species in 2009 and has potential to degrade and eliminate suitable habitat.[12] The small, fragmented populations are at a higher risk of extirpation or extinction through stochastic events and genetic bottlenecks.[11,12] Additionally, non-native grasses such as schismus (*Schismus* spp.) and bromes (*Bromus* spp.) have the potential to exclude Lane Mountain milk-vetch from shrub understories, outcompete for recruitment, and alter the natural fire regime.[8]

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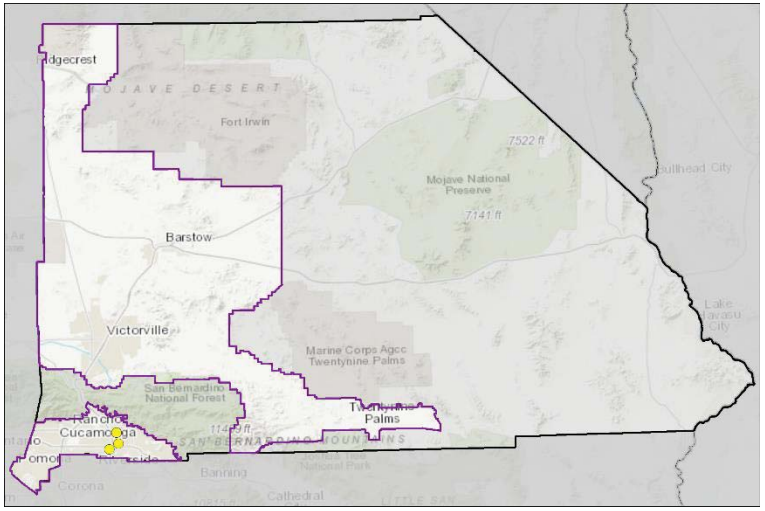
Marsh Sandwort (*Arenaria paludicola*)

Legal Status

State: Endangered; CRPR 1B.1*
Federal: Endangered[1]
Critical Habitat: Not applicable
Recovery Plan: Issued by USFWS on September 28, 1998[2]



Distribution: Marsh sandwort has been documented in scattered locations near the Pacific coast in Washington and California, as well as a few tentative records from Mexico and Guatemala.[2,3,4] These historical occurrences consist of 1 from Pierce County, Washington, and 9 from San Francisco, San Luis Obispo, Santa Cruz, and San Bernardino Counties, California.[4] Within California, historical collections were found in 5 general areas including Santa Cruz, the San Francisco Bay, Guadalupe-Nipomo Dunes, the Los Angeles basin, and along the Santa Ana River.[4] The only known extant wild population persists at Oso Flaco Lake at the Guadalupe-Nipomo Dunes, with an introduced population that exists at Sweet Springs Marsh in Morro Bay.[4]
RCIS Distribution: A total of 3 occurrences have been recorded in the Valley subarea along the Santa Ana River corridor; however, all records are historic and the species is considered likely extirpated from San Bernardino County (see map inset).[5]

Blooming Periods for Marsh Sandwort[4,8]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
				✓	✓	✓	✓				

Habitat Requirements: This species occurs in marshes and swamps among other mesic environments.[2,4,6] Little is known about its habitat requirements, but marsh sandwort has been found growing with or without standing water; in saturated, acidic soils; and within dense mats of reeds (*Juncus* spp.), cattails (*Typha* spp.), bur-reed (*Sparganium* spp.), and bulrush (*Scirpus* spp.).[3,4,6] This species may prefer moist soils and an open canopy in habitats dominated by water parsley (*Oenanthe sarmentosa*).[7]

Reproduction: This species is a perennial herb that produces small, white flowers that typically bloom from May to August.[4,8,9] Plants may reproduce sexually or asexually, and are able to be propagated by cuttings at root nodes.[2,4] Little is known about common pollinators, seed germination and dispersal, and seed recruitment for marsh sandwort.[3]

Pressures and Stressors: Primary pressures and stressors to this species are urbanization, eucalyptus tree recruitment, potential stochastic extirpation, and hydrological alterations.[2,4,5] Conversion of wetlands for agriculture, ranching, and development has occurred at rapid rates since the early part of the 20th century, which significantly limits suitable habitat for this wetland species.[2] Indirect effects from urbanization, including increased sedimentation, altered hydrologic regimes, and nutrient runoff, also degrade habitat and limit opportunity for introductions or reintroductions.[4] Eucalyptus trees reduce water availability, increase shade, and introduce tannins that inhibit growth of other species, and may exclude marsh sandwort from otherwise suitable habitat.[2,4] Since there is only one last extant wild population and one introduced population, risk of stochastic extirpation or extinction is very high, and inbreeding depression from lack of genetic diversity also threatens population viability.[4]

* California Rare Plant Rank **1B:** Rare, threatened, or endangered in California and elsewhere; **0.1:** Seriously threatened in California.

REFERENCES

1 58 FR 41378 41384. "Endangered and Threatened Wildlife and Plants; Determination of Endangered Status *Arenaria Paludicola* (Marsh Sandwort) and *Rorippa Gambellii* (Gambel's Watercress)." Final Rule. August 3, 1993.

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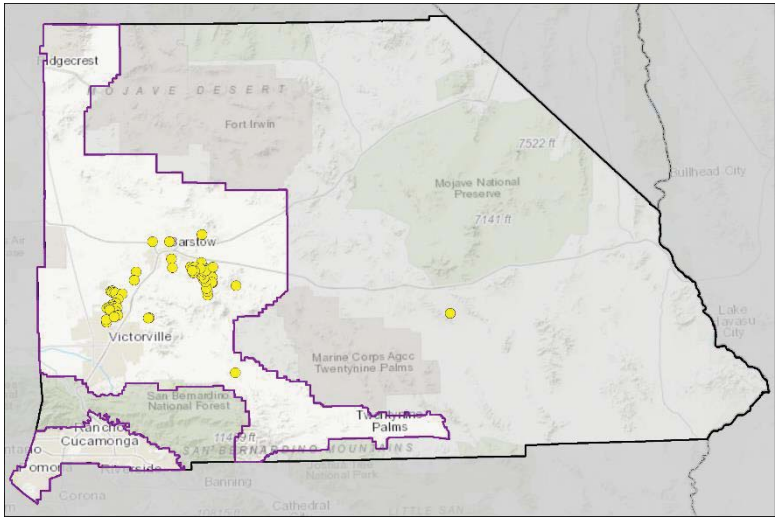
Mojave Monkeyflower (*Diplacus mohavensis*)

Legal Status

State: None; CRPR 1B.2*
Federal: BLM Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: This species is restricted to the Mojave Desert within west-central San Bernardino County, California.[1,2] Historical observations indicate this species range was bounded by Calico Ghost Town to the north, Kane Springs in the Newberry Mountains to the east, Old Woman Springs to the south, and the Mojave River to the west.[1,2,3] Current populations are densest in areas just south of Daggett and Barstow with a second population located northeast of Adelanto extending toward Helendale.[1,2] This species occupies an elevation range from 600 to 1,200 meters (1,969 to 3,937 feet).

RCIS Distribution: A total of 65 occurrences have been recorded in the West Desert subarea, primarily in the mountain areas south of Barstow and east of the Mojave River (see inset map).[4]

Blooming Periods for Mojave Monkeyflower[8]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
			✓	✓	✓						

Habitat Requirements: Mojave monkeyflower occurs in Mojavean desert scrub, Joshua tree woodland, and desert scrub, but is more specifically associated with creosote bush (*Larrea tridentata*).[2,5,6] Occurrence reports also indicate associations with desert senna (*Senna armata*), cheese bush (*Hymenoclea salsola*), rattany (*Krameria* spp.), cholla (*Opuntia* spp.), burro bush (*Ambrosia dumosa*), indigo bush (*Dalea* spp.), cat-claw acacia (*Acacia greggii*), Bigelow's monkeyflower (*Mimulus bigelovii*), desert bells (*Phacelia campanularia*), and desert trumpet (*Eriogonum inflatum*).[1,2] This species commonly occurs in granitic gravelly banks of desert washes, sandy openings between creosote bushes, and along the rocky slopes above washes, all of which do not experience regular water flows.[1,2,5,7]

Reproduction: This species blooms from April to June.[8] Requirements for and time of germination is unknown, although is presumed to be dependent upon precipitation based on wide variations in population sizes year to year.[2] Given the showy flowers and that the majority of plants in the lopseed family are insect pollinated, and Mojave monkeyflower is likely pollinated by Hymenoptera (bees, wasps, ants, and sawflies) or Lepidoptera (butterflies and moths).[2,9] Seed dispersal is likely abiotic due to the small size of the plant and seeds.[2,6]

Pressures and Stressors: Pressures and stressors impacting the Mojave monkeyflower includes development, mining, non-native plants, solar and wind energy projects, grazing, and off-highway vehicles (OHV).[2,5,6] Urbanization in the Barstow, Daggett, and Newberry Springs areas may displace otherwise suitable habitat, and has likely already had negative impacts on populations within the Barstow city limits.[2,5] The wide population fluctuations based largely on precipitation typical of this species suggest susceptibility to years of drought and potential decreases in the seed bank.[2] Furthermore, such small population sizes increase the risk of extirpation from detrimental stochastic events and may cause genetic bottlenecks diminishing genetic variability.[2]

* California Rare Plant Rank **1B:** Rare, threatened, or endangered in California and elsewhere; **0.2:** Moderately threatened in California.

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1 CDFW (California Department of Fish and Wildlife). 2018. "*Mimulus mohavensis*." Element Occurrence Query. California Natural Diversity Database (CNDDB). RareFind, Version 5.2.14 (Commercial Subscription). Sacramento, California: CDFW, Biogeographic Data Branch. Accessed January 2018. http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp.

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Parish's Daisy (*Erigeron parishii*)

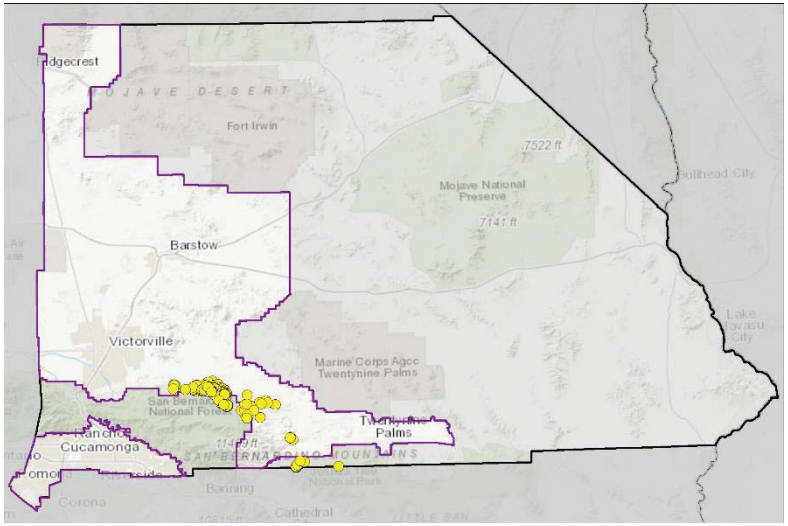
Legal Status

State: None; CRPR 1B.1*

Federal: Threatened[1]

Critical Habitat: Designated on December 24, 2002[2]

Recovery Plan: Issued by USFWS on September 30, 1997[3]



Distribution: Parish's daisy is restricted to dry, calcareous slopes of the San Bernardino Mountains in San Bernardino County, California.[4,5] A few observations from areas with granitic substrate extend its range to the east end of the San Bernardino Mountains and in the Little San Bernardino Mountains.[4] This species can be found from elevations of 800–2,000 meters (2,625–6,562 feet),[6] although the low end of that range is presumed incorrect as an elevation of 2,625 meters would indicate the species occurs on the flats of the Mojave desert, where it has never been collected.[4]

RCIS Distribution: A total of 219 occurrences have been recorded in the West Desert subarea particularly in the foothills of the San Bernardino Mountains around Cushenbury Springs (see map inset).[7]

Habitat Requirements: Parish's daisy occurs in Mojavean desert scrub, pinyon and juniper woodlands, blackbush scrub, and creosote bush-bursage scrub.[1,3,8] This species requires carbonate substrates, and although few collections are from granitic areas it is speculated that in these locations limestone materials have washed down from higher elevations.[4,8] Parish's daisy typically grows along rocky slopes, active washes, loose alluvial deposits, and outwash plains.[3,4,8]

Blooming Periods for Parish's Daisy[4,9]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
				✓	✓	✓	✓				

Reproduction: This species is a long-lived perennial and blooms from May to August, with flowering peaking from mid-May to mid-June.[4,9,10] Showy, conspicuous flowers suggest insects are the primary pollinators, likely including bees, butterflies, and long-tongued flies.[4] Plumed achenes are adapted for wind dispersal of seeds.[10]

Pressures and Stressors: Primary pressures and stressors to Parish's daisy populations is limestone mining, but threats also include off-highway vehicles and energy development projects.[3,8] Approximately 73% of the species' habitat is under claim for mining or vulnerable to other disturbances.[8] Growing development near Pioneertown is currently encroaching on occupied habitat and has the potential to displace the nearby population.[4] Mining activities not only remove carbonate substrates required for suitable habitat but also impact habitat through burial of adjacent unmined habitat, creation of dusts that can alter soil chemistry and light availability for seeds, and artificial lighting that may manipulate phenology and growing conditions.[8] Off-highway vehicles through U.S. Forest Service land and construction of power lines bisecting occupied areas further degrade soils and displace habitat.[3] Climate change may cause the Southern California region to become warmer and drier, which may drive this species to higher elevations until concentrated within an even more limited range more vulnerable to extinction.[8,11]

* California Rare Plant Rank (CRPR) **1B:** Rare, threatened, or endangered in California and elsewhere; **0.1:** Seriously threatened in California.

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2 7 FR 78570–78610. Final Rule: "Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Five Carbonate Plants from the San Bernardino Mountains in Southern California." December 24, 2002.

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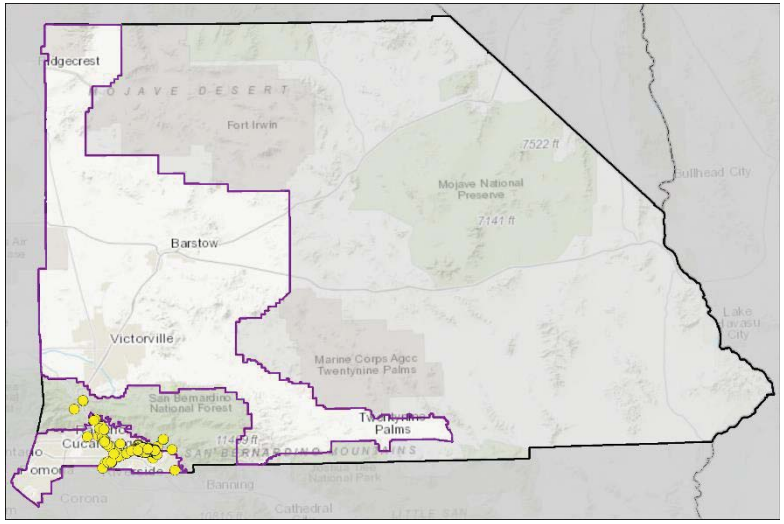
Legal Status

State: Endangered; CRPR 1B.1*
Federal: Endangered[1]
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The Santa Ana River woollystar is endemic to the Santa Ana watershed spanning San Bernardino, Riverside, and Orange counties in Southern California.[2,3] Historically, this subspecies was distributed from the base of the San Bernardino Mountains south to Santa Ana Canyon and may have occurred as far downstream as Santiago Canyon.[2,4] Santa Ana River woollystar has been observed at elevations of 91–610 meters (299–2,001 feet).[5] This subspecies was considered extirpated from Orange County and Riverside County,[1,2] but has been recently rediscovered in Riverside County just downstream of the border with San Bernardino County.[6]

RCIS Distribution: A total of 770 occurrences have been recorded in the Valley subarea, primarily in the Upper Santa Ana River wash area and the wash areas around Lytle Creek and Cajon Wash; however, the occurrence dataset for this species likely includes duplicate records (see inset map).[7]

Blooming Periods for Santa Ana River Woollystar[4,5]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
			✓	✓	✓	✓	✓	✓			

Habitat Requirements: Santa Ana River woollystar is associated with chaparral and alluvial fan sage scrub, and requires open, well-lit areas of sandy terraces above the ordinary high water mark of ephemeral watercourses.[3,4,5] This subspecies is a pioneer plant that colonizes washed deposits caused by sporadic stream flow, and prefers areas with below 50% vegetative cover and nutrient poor soils consisting of over 90% sand particles.[3,4] This subspecies is most commonly associated the pioneer and intermediate successional stages of alluvial scrub, and often co-occurs with California buckwheat (*Eriogonum fasciculatum*), fastigiated golden aster (*Heterotheca sessiliflora* ssp. *fastigiata*), California croton (*Croton californicus*), and scalebroom (*Lepidospartum squamatum*).[3,4,8]

Reproduction: This subspecies is a short-lived perennial subshrub that lives an average of 5 years and can grow up to 1 meter (3.3 feet) tall.[4] Germination and flowering are primarily influenced by seasonal rainfall and can occur between April and September but typically peaks around June.[4,5,9] Santa Ana River woollystar is likely an obligate outcrosser and does not self-pollinate.[4] Common pollinators include the giant flower-loving fly (*Rhaphiomidas acton* spp. *acton*), hummingbirds, bumble bees, halictid bees, and digger bees.[10] Seed dispersal occurs primarily by flooding.[4]

Pressures and Stressors: Santa Ana River woollystar pressure and stressors include hydrological modification, off-highway vehicle (OHV) use, mining, and non-native species.[1,3,4,5] Construction of dams, channelized streams, and further flood control measures alter the hydrological processes that shape the early successional vegetative stages on which this species relies.[4] A long-term impact study on the Seven Oaks Dam in San Bernardino County indicates that in the absence of large flood events suitable habitat for this subspecies will be reduced over time, most immediately for populations in intermediate successional stages.[11] The use of OHVs is an emerging threat near some occurrences degrading soils and plant communities, and mining activity remains near four occurrences of this subspecies.[4] Non-native grasses also degrade otherwise suitable habitat by reducing the amount of bare ground of which this species prefers.[4]

* California Rare Plant Rank (CRPR) **1B:** Rare, threatened, or endangered in California and elsewhere; **0.1:** Seriously threatened in California.

REFERENCES

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3 Zembal, R., and K.J. Kramer. 1984. The known limited distribution and unknown future of Santa Ana River woolly-star (Eriastrum). Crossosoma 10(5):1–6.

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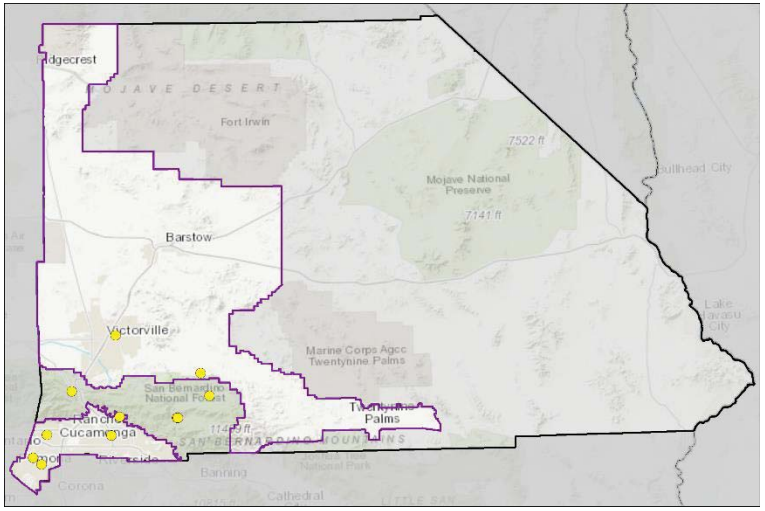
San Bernardino Aster (*Symphyotrichum defoliatum*)

Legal Status

State: None; CRPR 1B.2*
Federal: BLM Sensitive; USFS Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: The San Bernardino aster is distributed within Southern California, historically occurring in Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties.[1] Occurrences are scattered within the Peninsular Ranges, the Los Angeles basin, the San Gabriel, San Bernardino, and San Jacinto mountains, and to a lesser extent the Tehachapi Mountains and Santa Maria area.[2] Many of the populations in Los Angeles and Orange counties are considered extirpated.[2,3] Elevations of observed populations range from 2 to 2040 meters (7 to 6693 feet).[1]

RCIS Distribution: A total of 5 occurrences have been recorded in the Valley subarea; however, all but one record (1995 record near Fontana) are historic from the early 20th century (see inset map).[4] In the West Desert subarea, this species has been recorded at two locations: near Cushenbury Springs and Mojave Narrows Regional Park.

Blooming Periods for San Bernardino Aster[1,6]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
						✓	✓	✓	✓	✓	

Habitat Requirements: This species is found in a variety of habitats, including cismontane woodland, coastal scrub, and lower montane coniferous forest, although primarily associated with wetlands including marshes, meadows, seeps, and vernally mesic valley and foothill grasslands.[1,2,3] San Bernardino aster is considered rare in dry open grasslands and meadows at 4,900 feet in the upper Santa Ana River watershed.[5]

Reproduction: San Bernardino aster is a perennial rhizomatous herb with white to pale violet flowers the bloom from July to November.[1,6] Not much is known about the reproductive biology of this species, including seed germination, seed dispersal, and primary pollinators.

Pressures and Stressors: This species faces pressures and stressors from non-native species, hybridization, loss of habitat, and private land management.[1,3] Although comparatively widespread in its distribution in Southern California, the wetland habitats this species most often occupies have been largely influenced and degraded by urbanization and development. Non-native species have the potential to competitively exclude this species. Possible hybrid specimens have been collected from Ventura, Santa Barbara, and San Luis Obispo Counties, and suggest that the degradation of genetic purity may be a growing threat to species viability.[1] Furthermore, many of the extant occurrences in Riverside, San Diego, and Orange counties are located on private lands and are threatened by inadequate species management.[3]

* California Rare Plant Rank **1B:** Rare, threatened, or endangered in California and elsewhere; **0.2:** Moderately threatened in California.

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2 CDFW (California Department of Fish and Wildlife). 2018. "*Symphyotrichum defoliatum*." Element Occurrence Query. California Natural Diversity Database (CNDDB). RareFind, Version 5.2.14 (Commercial Subscription). Sacramento, California: CDFW, Biogeographic Data Branch. Accessed February 2018. http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp.

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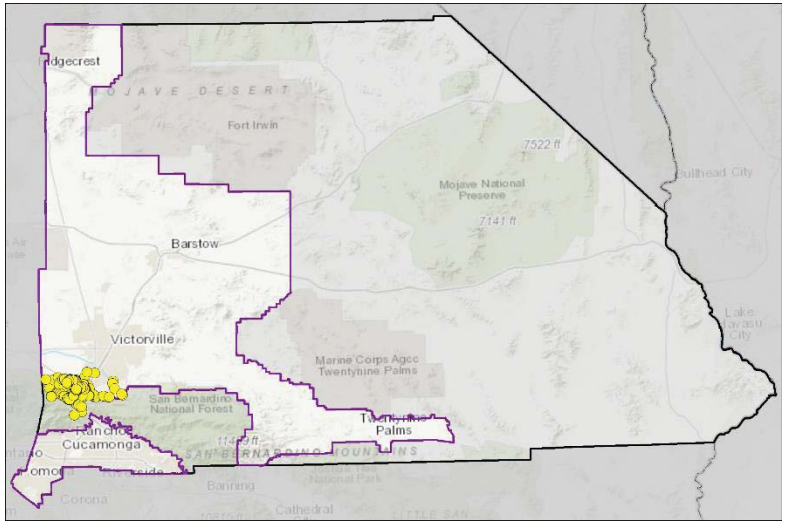
4 SBC RCIS (San Bernardino County Regional Conservation Investment Strategy). 2017. Composite Species Occurrence GIS dataset compiled in 2017 from post-1990 records from the following sources CNDDB, US Fish and Wildlife Service, US Forest Service, US Bureau of Land Management, San Bernardino County Museum, San Bernardino County Department of Public Works, Upper Santa Ana River HCP, VertNET, and California Consortium of Herbaria.

5 Fraga, N.S., Gross, L., Bell, D., Mistretta, O., Wood, J. and Stoughton, T., 2011. The vascular flora of the upper Santa Ana River watershed, San Bernardino Mountains, California. Rancho Santa Ana Botanic Garden, Claremont, California.

6 Geraldine A. Allen 2012, *Symphyotrichum defoliatum*, in Jepson Flora Project (eds.) Jepson eFlora, http://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=80964, accessed on February 06, 2018.

Legal Status

State: None; CRPR 1B.2*
Federal: BLM Sensitive; USFS Sensitive
Critical Habitat: Not applicable
Recovery Plan: Not applicable



Distribution: Short-joint beavertail occurs within Los Angeles and San Bernardino counties in California along the northern slopes of the San Gabriel and San Bernardino mountains.[1,2] Specifically, it can be found from Quigley Canyon ranging northeast to Anaverde Valley, following the San Andreas rift zone to Cajon Pass as well as at Mill Creek Summit within the Angeles National Forest.[3,4] This species has been observed at elevations ranging from 425–1,800 meters (1,394–5,906 feet).[5]

RCIS Distribution: A total of 23 occurrences have been recorded in the West Desert subarea, primarily in the foothills south of Phelan and Hesperia both west and east of Interstate 15 (see map inset).[6] The species also occurs in similar adjacent habitats in the adjacent Mountain region.

Habitat Requirements: This species can be found in chaparral, Joshua tree woodland, Mojavean desert scrub, and pinyon-juniper woodland vegetation communities.[3,4,5] Suitable soils range from sandy to rocky, in open stream beds and on rocky slopes.[3] Common associated species include Joshua tree (*Yucca brevifolia*), California juniper (*Juniperus californica*), scrub oak (*Quercus john-tuckeri*), and ceanothus (*Ceanothus greggii*), and common species within Angeles National forest include chamise (*Adenostema fasciculatum*), ceanothus (both *Ceanothus crassifolius* and *Ceanothus greeggii* var. *vestitus*), the Lord's candle *(Yucca whipplei* ssp. *caespitosa*), and California sycamore (*Platanus racemosa*).[3]

Blooming Periods for Short-Joint Beavertail[1,5]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
			✓	✓	✓						

Reproduction: Short-joint beavertail is a small cactus, about 1.5–5 centimeters wide, that flowers from April to June.[1,5] Pollinators include medium to large bees, but beetles may also play a role and have been observed in these flowers.[3] Seeds do not germinate within the fruit itself, due to inhibitory chemicals.[7] The brightly colored and juicy fruits of this species suggests dispersal by birds and seeds themselves might be eaten by insects, rodents, and birds.[7]

Pressures and Stressors: Current and potential pressures to short-joint beavertail include occurrences on private land, development, off-highway vehicles (OHV), limestone mining, oil drilling, horticultural collections, and prescribed burns.[3,5,] The majority of this species range in San Bernardino County is located on private lands, and development is accelerating in the vicinity of Pinon Hills, Phelan, and Oak Hills potentially degrading and displacing habitat.[3] The Cajon Pass area is subject to extensive OHV use causing erosion and potentially trampling individual plants.[3] Proposed limestone mining near Wrightwood and oil drilling at Quigley Canyon pose threats to extant populations.[3] It is uncertain how well adapted short-joint beavertail is to fire, but prescribed burns planned for the desert regions within its range may negatively impact populations.[7] The showy and beautiful flowers of this species make it desirable for growers, and horticultural collections may have marked impacts on populations as well.[3,5]

* California Rare Plant Rank (CRPR) **1B:** Rare, threatened, or endangered in California and elsewhere; **0.1:** Seriously threatened in California.

REFERENCES

1 Parfitt, B.D. 2012, *Opuntia basilaris* var. *brachyclada*, in Jepson Flora Project (eds.) Jepson eFlora, http://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=62542, accessed on February 02, 2018.

2 NatureServe. 2017. "*Opuntia basilaris* var. *brachyclada*." NatureServe Explorer: An Online Encyclopedia of Life. Version 7.1. Arlington, Virginia: NatureServe. Last updated November 2016. Accessed February 1, 2018. http://www.natureserve.org/explorer.

3 MacKay, P.J. 2006. "Short-joint beavertail." West Mojave Plan Species Accounts. U.S. Department of the Interior, Bureau of Land Management. January 2006.

4 CDFW (California Department of Fish and Wildlife). 2018. "*Opuntia basilaris* var. *brachyclada*." Element Occurrence Query. California Natural Diversity Database (CNDDB). RareFind, Version 5.2.14 (Commercial Subscription). Sacramento, California: CDFW, Biogeographic Data Branch. Accessed January 2018. http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp.

5 CNPS (California Native Plant Society). 2018. "*Opuntia basilaris* var. *brachyclada*." Inventory of Rare and Endangered Plants (online edition, v8-03 0.39). Sacramento, California: California Native Plant Society. Accessed January 2018. http://www.cnps.org/inventory.

6 SBC RCIS (San Bernardino County Regional Conservation Investment Strategy). 2017. Composite Species Occurrence GIS dataset compiled in 2017 from post-1990 records from the following sources CNDDB, US Fish and Wildlife Service, US Forest Service, US Bureau of Land Management, San Bernardino County Museum, San Bernardino County Department of Public Works, Upper Santa Ana River HCP, VertNET, and California Consortium of Herbaria.

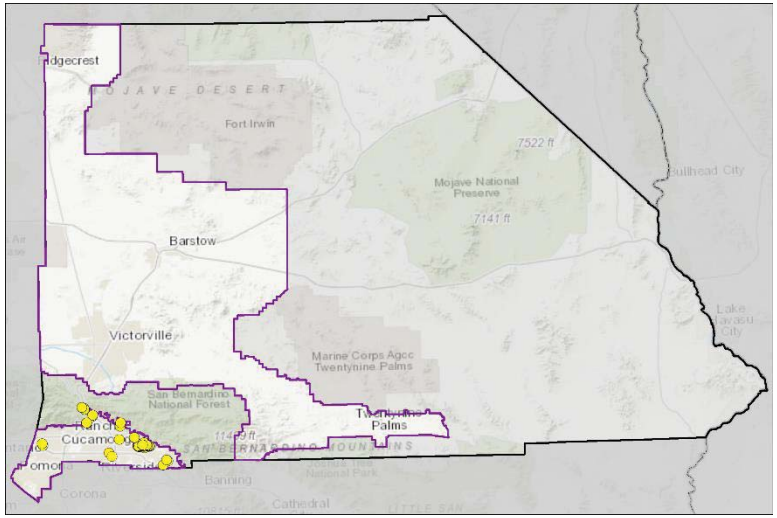
7 Mistretta, O. and M. Parra-Szijj. 1991. Species Management Guide for *Opuntia basilaris* Engelm. and Bigel. var. *brachyclada* (Griffiths) Munz. Technical Report No. 7, USDA Forest Service, Angeles National Forest, and Rancho Santa Ana Botanic Garden, Claremont, California.

Legal Status

State: Endangered; CRPR 1B.1*
Federal: Endangered[1]
Critical Habitat: Not applicable
Recovery Plan: Not applicable

Distribution: The slender-horned spineflower is endemic to southwestern California and ranges from central Los Angeles County, east to San Bernardino County, and south to southwestern Riverside County.[2,3] The species occurs in sparse, scattered locations in the foothills of the San Gabriel, San Bernardino, and San Jacinto mountains.[4,5] Populations are presumed extant within 10 watersheds across the three counties, and include 20 occurrences total.[2,3] This species can be found at elevations of 200–760 meters (656–2,493 feet).[6]

RCIS Distribution: A total of 67 occurrences have been recorded scattered around the Valley subarea, primarily in the Upper Santa Ana River wash area and the wash areas around Lytle Creek and Cajon Wash (see map inset).[7] Records around Upland, Colton, and Yucaipa may no longer occur.



Blooming Periods for Slender-Horned Spineflower[4,5]

Jan	Feb	Mar	April	May	June	July	Aug	Sep	Oct	Nov	Dec
			✓	✓	✓						

Habitat Requirements: This species is associated with chaparral, cismontane woodland, and alluvial fan sage scrub, commonly located on terraces and benches where intermittent, scouring flood events occur.[2,3] Required microhabitat appears to be shallow depressions on relatively flat slopes where soils are high in silt and low in nutrients and organic matter.[8,9]

Reproduction: Slender-horned spineflower is a spring annual herb that typically germinates in late February or early March likely in response to winter rains.[2] This species flowers from April or May to June.[4,5] In drought, plants likely do not survive long enough to reach flowering stages, but in cool, wet conditions are more successful.[2] This slender-horned spineflower is likely pollinated by a variety of species which potentially includes a native wasp (*Plenoculus davisii*).[2] Seed banks appear to be critical in restoring above-ground populations both demographically and genetically.[10]

Pressures and Stressors: Primary pressures and stressors to slender-horned spineflower populations are urbanization, mining, alteration of natural fluvial systems, off-highway vehicle (OHV) use, small population sizes, and non-native species.[1,2,6] This species often co-occurs with non-native grasses and can be competitively excluded when density of exotic grasses is high.[8] Development in these Southern California basins is extensive and eliminates or compromises the quality of adjacent alluvial fan habitat.[2] Sand and gravel mining is a pressure to three extant populations in San Bernardino County and one population in Riverside County.[2] Channelization, flood control measures, and reservoir expansion eliminate or significantly alter the natural fluvial processes that define alluvial fan ecological systems, severely degrading habitat for this species.[2] Permissible as well as unreported OHV usage occurs on many of the areas where slender-horned spineflower populations are located and may trample plants, break down soils structure, alter hydrological processes, and introduce non-native plants.[2] Finally, such small and fragmented populations reduce genetic exchange and resiliency to stochastic events, and puts this species at higher risk of local extirpation or extinction.[2]

* California Rare Plant Rank (CRPR) **1B:** Rare, threatened, or endangered in California and elsewhere; **0.1:** Seriously threatened in California.

REFERENCES

1 52 FR 36265 36270. "Endangered and Threatened Wildlife and Plants; Endangered Status for *Eriastrum densifolium* spp. *sanctorum* (San Ana River Woolly-Star) and *Centrostegia leptoceras* (Slender-horned Spineflower)." Final Rule. September 28, 1987.

2 USFWS (U.S. Fish and Wildlife Service). 2008. *Dodecahema leptoceras* (slender-horned spineflower) 5-Year Review: Summary and Evaluation. Carlsbad Fish and Wildlife Office Carlsbad, California. October 1, 2010.

3 CDFW (California Department of Fish and Wildlife). 2018. "*Dodecahema leptoceras*." Element Occurrence Query. California Natural Diversity Database (CNDDB). RareFind, Version 5.2.14 (Commercial Subscription). Sacramento, California: CDFW, Biogeographic Data Branch. Accessed January 2018. http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp.

4 Reveal, J.L and T.J. Rosatti 2012, *Dodecahema leptoceras*, in Jepson Flora Project (eds.) Jepson eFlora, http://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=23188, accessed on February 02, 2018.

5 NatureServe. 2017. "*Dodecahema leptoceras*." NatureServe Explorer: An Online Encyclopedia of Life. Version 7.1. Arlington, Virginia: NatureServe. Last updated November 2016. Accessed February 1, 2018. http://www.natureserve.org/explorer.

6 CNPS (California Native Plant Society). 2018. "*Dodecahema leptoceras*." Inventory of Rare and Endangered Plants (online edition, v8-03 0.39). Sacramento, California: California Native Plant Society. Accessed January 2018. http://www.cnps.org/inventory.

7 SBC RCIS (San Bernardino County Regional Conservation Investment Strategy). 2017. Composite Species Occurrence GIS dataset compiled in 2017 from post-1990 records from the following sources CNDDB, US Fish and Wildlife Service, US Forest Service, US Bureau of Land Management, San Bernardino County Museum, San Bernardino County Department of Public Works, Upper Santa Ana River HCP, VertNET, and California Consortium of Herbaria.

8 Allen, E.B. 1996. Characterizing the Habitat of Slender-horned Spineflower (*Dodecahema leptoceras*). Department of Botany and Plant Sciences, UC Riverside, California. Prepared for California Department of Fish and Game, Region 5. December 20, 1996.

9 Wood, Y. 1996. Final Report: Characterizing the Habitat of Slender-Horned Spineflower (*Dodecahema leptoceras*): Geomorphic Analysis. Department of Soils and Environmental Sciences, UC Riverside, California. Prepared for California Department of Fish and Game, Region 5.

10 Ferguson, N. J. and N.C. Ellstrand. 1999. Assessment of Seed Bank Buffering of Genetic Change in *Dodecahema Leptoceras* (Slender-horned Spineflower). Department of Botany and Plant Sciences, UC Riverside, California. Prepared for California Department of Fish and Game, Region 5. June 15, 1999.

APPENDIX B

Key Data Descriptions

San Bernardino County Regional Conservation Investment Strategy
PlanBase Metadata
Dudek
Last Update: April 18, 2017

PlanBase Data Description:

The PlanBase layer was created from multiple existing sources to characterize and map the various designations, land ownerships, and jurisdictions in San Bernardino County. This layer is intended to be used to support the landscape-scale analysis of land uses and land protection status in the County. It should be noted that data on land ownership, designations, and management differ in their quality, resolution, and accuracy from different sources, and it is not always possible to identify the authoritative source. For this reason, the plan base includes attribute information from each of the sources that can be analyzed in multiple ways. Data used to develop the PlanBase layer came from the following sources: County of San Bernardino, PlaceWorks, SANBAG, BLM, California State Parks, US Protected Areas Dataset, and California Protected Areas Dataset. The Local Conserved Land Inventory was developed separate from the PlanBase; they are intended to be used together. Dudek_Map Category attribute is a single field that can be used to map and characterize the designations in the County for the purposes of the the landscape-scale analysis.

PlanBase Attribute Name	GIS Source Layer Name	Dudek Source	Original Source
CountyBoundary_150712	CountyBoundary_150712	Placeworks	County
Supervisor_Dist	SupervisorialDistricts_150712	Placeworks	County
Comm_Plan	cp_boundary	Placeworks	County
Regions	Regions_151006	Placeworks	County
Regions_RSA	Regions_RSA	Placeworks	County
City	CityLimits_150712	Placeworks	County
City_SOI	CitySphereOfInfluence_150712	Placeworks	County
OWN_ADMIN_DEPT	LandStatus_v10_1.gdb, LndSurfaceEstate_SMA_160309	Placeworks	BLM; http://www.blm.gov/ca/gis/
OWN_ADMIN_AGENCY	LandStatus_v10_1.gdb, LndSurfaceEstate_SMA_160309	Placeworks	BLM; http://www.blm.gov/ca/gis/
OWN_ADMIN_UNIT	LandStatus_v10_1.gdb, LndSurfaceEstate_SMA_160309	Placeworks	BLM; http://www.blm.gov/ca/gis/
OWN_ADMIN_UNIT_TYPE	LandStatus_v10_1.gdb, LndSurfaceEstate_SMA_160309	Placeworks	BLM; http://www.blm.gov/ca/gis/
OWN_CA_STATE_NAME	LandStatus_v10_1.gdb, LndSurfaceEstate_SMA_160309	Placeworks	BLM; http://www.blm.gov/ca/gis/
USPAD_p_des_tp	PADUSCBIEdition_v2	DataBasin	DataBasin; https://databasin.org/datasets/f10a00eff36945c9a1660fc6dc54812e
USPAD_t_des_nm	PADUSCBIEdition_v2	DataBasin	DataBasin; https://databasin.org/datasets/f10a00eff36945c9a1660fc6dc54812e
USPAD_gap_sts	PADUSCBIEdition_v2	DataBasin	DataBasin; https://databasin.org/datasets/f10a00eff36945c9a1660fc6dc54812e
AGENCY NAME	CPAD_AGENCY NAME	CPAD Version 2016a	http://www.calands.org/
AGENCY LEVEL	CPAD_AGENCY LEVEL	CPAD Version 2016a	http://www.calands.org/
MNG_AGENCY	CPAD_MNG AGENCY	CPAD Version 2016a	http://www.calands.org/
SITE_NAME	CPAD_SITE NAME	CPAD Version 2016a	http://www.calands.org/
SANBAG_OpenSpace	Local Open Space_SANBAG	SANBAG	Composite of data received from local jurisdictions for the SANBAG Habitat Conservation Framework Phase I
ACEC Name	BLM ACECs	BLM	BLM; http://www.blm.gov/ca/gis/
ACEC	BLM ACECs	BLM	BLM; http://www.blm.gov/ca/gis/
DRECP_ACEC	BLM ACECs	BLM	BLM; http://www.blm.gov/ca/gis/
NLCS_NAME	BLM National Conservation Lands	BLM	BLM; http://www.blm.gov/ca/gis/
NLCS	BLM National Conservation Lands	BLM	BLM; http://www.blm.gov/ca/gis/
BLM_WILD_WSA	nlcsWilderness_V10_160302.gdb, nlcs_wsa_poly, nlcs_wild_poly	Placeworks	BLM; http://www.blm.gov/ca/gis/
DRECP_WILD	BLM Wilderness	BLM	BLM; http://www.blm.gov/ca/gis/
DRECP_NCL	BLM National Conservation Lands	BLM	BLM; http://www.blm.gov/ca/gis/
Nat_Monuments	nlcsNatMonuments_v10_160302.gdb, nlcs_nm_nca_poly; national_monument_SBCo_2014	Placeworks	BLM; http://www.blm.gov/ca/gis/ County of San Bernardino
CA_Parks_Name	CAParksBoundaries	CA State Parks	
CA_Parks_Mgmt	CAParksBoundaries	CA State Parks	
Dudek_MapCategory_Update	NA	NA	Dudek
County_Jurisdiction	NA	Placeworks	NA
RCIS_Subarea1_2	NA	Dudek	NA

METADATA

GIS LAYER: Local Conserved Land Inventory
PREPARED FOR: San Bernardino County Transportation Authority and the County of San Bernardino
COMPILED BY: Dudek
Version: May 22, 2017

San Bernardino County Local Conserved Land Inventory

Data Description: The purpose of the Local Conserved Land Inventory is to store and maintain data specifically about local conserved lands in the San Bernardino County. Authoritative data about land ownership, jurisdictional boundaries, land use designations, and parcel information is stored and maintained separately from this inventory and is therefore not included here to avoid duplicative, inaccurate, or outdated information. Source data for the Local Conservation Land Inventory compiled from: The Nature Conservancy, Wildlands, Mojave Desert Land Trust, Transition Habitat Conservancy, Inland Empire Resource Conservation District, Land Veritas, San Bernardino Department of Public Works, City of Fontana, City of Rancho Cucamonga, City of Colton, San Bernardino Associated Governments, and the other land conserved via conservation easement including as inventoried by the California Conservation Easement Database.

Attribute	Attribute Description
Object ID	Unique ID number for the conserved land record
Land Name	Conserved land name or project name to which the conserved land is related. Include project number if available; assign default name if data is missing
Mitigation	Attribute indicating whether the land was used as mitigation for a project, and if applicable the agencies/permits it was used for
Conserved Land Class	Assigned type of conserved land: Local Public, Trust, Easement, Bank, Local Designation, Other
Conserved Land Notes	Descriptive information about the property; use for describing the Other class if applicable
Instrument	Legal or legislative land protection instrument. Classes include: Fee-owned, Easement, Deed Restriction, Dedication, Covenant, Landowner Agreement, Bank, Designation, Other, Unknown
Instrument Year	Year [Format: XXXX or NA] instrument was enacted
Land Owner	Include contact information for land owner, if known
Easement Holder	Include contact information for easement holder, if known
Management Responsibility	Type of entity responsible for land management. Classes include: Federal, State, City, County, District, Non-Profit, Private, Mixed, Other, Unknown
Management Agency	Entity responsible for land management if known
Funding	Land management funding type, if applicable, and could include responses like full endowment, partial endowment, private or non-profit funded, public funded, none, unknown. Include endowment holder name if applicable
Data Source	Source of the spatial and non-spatial information
Dudek Source	Dudek's source of the GIS layer

GIS LAYER: San Bernardino County Modeled Habitat Linkages
PREPARED FOR: San Bernardino County Transportation Authority and the County of San Bernardino
COMPILED BY: Dudek
Version: March 12, 2018

Data Description and Sources: A composite habitat linkage layer was developed for San Bernardino County from multiple sources, including California Essential Habitat Connectivity Project, South Coast Wildlands Desert Linkage Network, South Coast Wildlands Joshua Tree Twenty Nine Palms Wildlife Corridors, South Coast Wildlands Missing Linkages Wildlife Corridors, Desert Tortoise Conservation Areas and Linkages, and Conservation Biology Institute (CBI) West Mojave ecoregion connectivity modeling for Large and Small species.

GIS LAYER: San Bernardino County – San Bernardino County Vegetation Communities
PREPARED FOR: San Bernardino County Transportation Authority and the County of San Bernardino
COMPILED BY: Dudek
Version: March 12, 2018

Data Description and Sources: Hierarchical, seamless, National Vegetation Classification Standard (NVCS)-based vegetation community dataset was developed for San Bernardino County from multiple sources, including the CDFW Alliance-level mapping of the DRECP (AIS 2013), Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) (USFS 2014), and SANBAG existing land-use layer (SANBAG 2012).

GIS LAYER: San Bernardino County Species Occurrences
PREPARED FOR: San Bernardino County Transportation Authority and the County of San Bernardino
COMPILED BY: Dudek
Version: March 12, 2018

Data Description and Sources: A composite species occurrence dataset was developed for San Bernardino County from multiple sources, including: CDFW California Natural Diversity Database (CNDDB), US Fish and Wildlife Service, US Forest Service, US Bureau of Land Management, San Bernardino County Museum, San Bernardino County Department of Public Works, Upper Santa Ana River HCP, VertNET, and California Consortium of Herbaria. The data attributes were standardized across all sources for Taxa, Common Name, Scientific Name, Status, and Source. Additionally, the data was geospatially processed and attributed to identify potential duplicate points in close proximity of each other (i.e., points of the same species from different sources within 100 feet will be coded as potential duplicates).

San Bernardino County RCIS - Species Habitat Areas

Common Name	Scientific Name	CODE	SPECIES HABITAT AREAS - Data Source
HERPS			
Agassiz's desert tortoise	*Gopherus agassizii*	*DETO*	WEST MOJAVE SUBAREA ONLY DRECP Species Distribution Model (USGS Maxent (CBI))
arroyo toad	*Anaxyrus californicus*	*ARTO*	WEST DESERT SUBAREA ONLY DRECP Species Distribution Model (CBI); revised to remove portion downstream of Mojave Forks Dam
Blainville's horned lizard	*Phrynosoma blainvillii*	*CHLI*	VALLEY AND WEST DESERT Subareas SBCo Vegetation Layer; Habitat Group = Transition Scrub, Chaparral, and Woodland; Grassland; Riversidean Alluvial Fan Sage Scrub. In West Desert limit to foothills with the 3,000 ft topo line; Desert horned lizard occurs in lower desert floor areas.
California red-legged frog	*Rana draytonii*	*CRLF*	NO HABITAT AREAS IDENTIFIED
Mojave fringe-toed lizard	*Uma scoparia*	*MFTL*	WEST DESERT ONLY DRECP Species Distribution Model (CBI)
San Bernardino Ringneck snake	*Diadophis punctatus similis*	*SBRS*	VALLEY ONLY SBCo Vegetation Layer; Habitat Group = Riversidean Alluvial Fan Sage Scrub.
Western pond turtle	*Emys marmorata*	*WPTU*	VALLEY AND WEST DESERT SBCo Vegetation Layer; Habitat Group = Riparian and Wetland
Western spadefoot	*Spea hammondii*	*WESP*	VALLEY ONLY SBCo Vegetation Layer; Habitat Group = Transition Scrub, Chaparral, and Woodland; Grassland; Riversidean Alluvial Fan Sage Scrub.
BIRDS			
Bell's sparrow	*Artemisiospiza belli belli*	*BESP*	VALLEY ONLY SBCo Vegetation Layer; Habitat Group = Transition Scrub, Chaparral, and Woodland; Grassland; Riversidean Alluvial Fan Sage Scrub.
burrowing owl*	*Athene cunicularia*	*BUOW*	VALLEY AND WEST DESERT SBCo Vegetation Layer; Habitat Group = Grassland; Riversidean Alluvial Fan Sage Scrub; Developed and Agriculture; Desert Scrub
coastal California gnatcatcher	*Polioptila californica californica*	*CAGN*	VALLEY ONLY SBCo Vegetation Layer; TopLevel_Dudek = Riversidean Alluvial Fan Sage Scrub; Coastal Scrub

San Bernardino County RCIS - Species Habitat Areas

Common Name	Scientific Name	CODE	SPECIES HABITAT AREAS - Data Source
golden eagle	*Aquila chrysaetos*	*GOEA*	WEST DESERT ONLY DRECP Species Distribution Model (CBI)
Le Conte's thrasher	*Toxostoma lecontei*	*LETH*	WEST DESERT ONLY AVRCIS Species Distribution Model (CBI)
least Bell's vireo*	*Vireo bellii pusillus*	*BEVI*	VALLEY AND WEST DESERT SBCo Vegetation Layer; Habitat Group = Riparian and Wetland
Swainson's hawk	*Buteo swainsoni*	*SWHA*	WEST DESERT ONLY AVRCIS Species Distribution Model (CBI)
tricolored blackbird*	*Agelaius tricolor*	*TRBL*	VALLEY AND WEST DESERT SBCo Vegetation Layer; TopLevel_Dudek = Riparian and Desert Wash; Wetlands and Waters; Agriculture
white-tailed kite	*Elanus leucurus*	*WTKI*	VALLEY ONLY SBCo Vegetation Layer; TopLevel_Dudek = Riparian and Desert Wash; Wetlands and Waters; Grassland; Coastal Scrub
willow flycatcher*	*Empidonax traillii*	*WIFL*	VALLEY AND WEST DESERT SBCo Vegetation Layer; Habitat Group = Riparian and Wetland
western yellow-billed cuckoo*	*Coccyzus americanus occidentalis*	*WYBC*	VALLEY AND WEST DESERT SBCo Vegetation Layer; Habitat Group = Riparian and Wetland
MAMMALS			
American badger	*Taxidea taxus*	*AMBA*	WEST DESERT ONLY AVRCIS Species Distribution Model (CBI)

San Bernardino County RCIS - Species Habitat Areas

Common Name	Scientific Name	CODE	SPECIES HABITAT AREAS - Data Source
desert bighorn sheep	*Ovis canadensis nelsoni*	*DBHS*	WEST DESERT ONLY DRECP Species Distribution Model (CBI)
desert kit fox	*Vulpes macrotis*	*DKFO*	WEST DESERT ONLY AVRCIS Species Distribution Model (CBI)
Los Angeles pocket mouse	*Perognathus longimembris brevinasus*	*LAPM*	VALLEY ONLY SBCo Vegetation Layer; Habitat Group = Riversidean Alluvial Fan Sage Scrub.
Mohave ground squirrel	*Xerospermophilus mohavensis*	*MGSQ*	WEST DESERT ONLY DRECP Species Distribution Model (USGS Maxent (CBI))
Mojave river vole	*Microtus californicus mohavensis*	*MRVO*	WEST DESERT ONLY DRECP Species Distribution Model
Mountain lion	*Puma concolor*	*MOLI*	VALLEY ONLY Select entire VALLEY subarea
pallid bat	*Antrozous pallidus*	*PABA*	WEST DESERT ONLY DRECP Species Distribution Model
San Bernardino kangaroo rat	*Dipodomys merriami parvus*	*SBKR*	VALLEY ONLY SBCo Vegetation Layer; Habitat Group = Riversidean Alluvial Fan Sage Scrub
Townsend's big-eared bat	*Corynorhinus townsendii*	*TBEB*	WEST DESERT ONLY DRECP Species Distribution Model
FISH			
Arroyo chub	*Gila orcuttii*	*ARCH*	VALLEY ONLY USFWS Critical Habitat for Santa Ana Sucker
Mohave tui chub	*Siphateles bicolor mohavensis*	*MTCH*	DRECP Species Distribution Model
Santa Ana Speckled dace	*Rhinichthys osculus* ssp. *3*	*SASD*	VALLEY ONLY USFWS Critical Habitat for Santa Ana Sucker Plus to that add Plunge Creek
Santa Ana Sucker	*Catostomus santaanae*	*SASU*	VALLEY ONLY USFWS Critical Habitat for Santa Ana Sucker
INVERTEBRATES			

San Bernardino County RCIS - Species Habitat Areas

Common Name	Scientific Name	CODE	SPECIES HABITAT AREAS - Data Source
Delhi Sands flower-loving fly	*Rhaphiomidas terminatus abdominalis*	*DSFF*	VALLEY ONLY Delhi Sands where SBCo Vegetation Layer; Habitat Group <> Developed and Agriculture
Victorville shoulderband	*Helminthoglypta mohaveana*	*VISH*	WEST DESERT ONLY DRECP Species Distribution Model for Mojave River Vole
PLANTS			
Alkali mariposa lily	*Calichortus striatus*	*AMLI*	WEST DESERT ONLY DRECP Species Distribution Model
Barstow woolly sunflower	*Eriophyllum mohavense*	*BWSU*	WEST DESERT ONLY DRECP Species Distribution Model
Gambel's water cress	*Nasturtium gambelii*	*GWCR*	NO HABITAT AREAS IDENTIFIED
Joshua tree	*Yucca brevifolia*	*JOTR*	WEST DESERT ONLY SBCo Vegetation Layer; TopLevel_Dudek = Joshua Tree Woodland
Lane Mountain milkvetch	*Astragalus jaegerianus*	*LMMI*	WEST DESERT ONLY DRECP Species Distribution Model (CBI)
Marsh sandwort	*Arenaria paludicola*	*MASA*	NO HABITAT AREAS IDENTIFIED
Mojave monkeyflower	*Mimulus mohavensis*	*MOMO*	WEST DESERT ONLY DRECP Species Distribution Model (CBI)
Parish's daisy	*Erigeron parishii*	*PADA*	WEST DESERT ONLY DRECP Species Distribution Model (CBI)
San Bernardino aster*	*Symphyotrichum defoliatum*	*SBAS*	VALLEY AND WEST DESERT SBCo Vegetation Layer; Habitat Group = Riparian and Wetland
Santa Ana River woollystar	*Eriastrum densifolium ssp. sanctorum*	*SARW*	VALLEY ONLY SBCo Vegetation Layer; Habitat Group = Riversidean Alluvial Fan Sage Scrub.
Short-joint beavertail	Opuntia basilaris var. brachyclada	SJBE	WEST DESERT ONLY AVRCIS Species Distribution Model (CBI)
slender-horned spineflower	*Dodecahema leptoceras*	*SHSP*	VALLEY ONLY SBCo Vegetation Layer; Habitat Group = Riversidean Alluvial Fan Sage Scrub.