

Countywide Habitat Preservation/Conservation Framework Development

Prepared for:

San Bernardino Associated Governments

Prepared by:

DUDEK

3685 Main Street, Suite 250
Riverside, California 92501
Contact: Stephanie Standerfer

FEBRUARY 2015

San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development

TABLE OF CONTENTS

<u>Section</u>	<u>Page No.</u>
1 INTRODUCTION.....	1-1
1.1 Background.....	1-1
1.2 Preservation/Conservation Framework Purpose and Objectives.....	1-2
1.3 Conservation Framework Development Process	1-4
1.4 Document Organization	1-8
2 OUTREACH AND DATA GATHERING	2-1
2.1 Outreach.....	2-1
2.2 Data Gathering and Database Development	2-10
3 DATA GAPS.....	3-1
4 CONSERVATION ANALYSIS.....	4-1
4.1 Regulatory and Planning Context	4-1
4.1.1 Federal Regulatory and Planning Context	4-1
4.1.2 State Regulatory and Planning Context	4-4
4.1.3 Regional and Local Regulatory and Planning Context.....	4-6
4.1.4 Other Planning Considerations	4-19
4.2 Landscape-scale Biological Resources Summary	4-23
4.2.1 Plant and Wildlife Species	4-23
4.2.2 Natural Communities	4-31
4.2.3 Habitat Linkages and Wildlife Movement.....	4-32
4.2.4 Physical Conditions	4-37
4.3 Conservation Framework Considerations.....	4-38
4.3.1 Regional Considerations	4-42
4.3.2 Preliminary Gap Analysis	4-63
4.3.3 Economic Development and Streamlining Considerations	4-65
4.3.4 Regulatory and Implementation Structure Considerations	4-67
5 CONSERVATION PLANNING SUBAREAS	5-1
5.1 Potential Subarea Approaches	5-1
5.2 Criteria for Evaluating the Subarea Approaches	5-15
5.3 Evaluation of the Potential Subarea Approaches.....	5-16
5.3.1 Region Subareas.....	5-16
5.3.2 Ecoregion Subareas.....	5-16
5.3.3 Watershed Subareas	5-18
5.3.4 Jurisdictional Subareas.....	5-18

San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development

TABLE OF CONTENTS

<u>Section</u>	<u>Page No.</u>
5.3.5 Region-Jurisdiction Subareas.....	5-19
5.4 Subarea Approach for the Conservation Framework.....	5-21
6 PRINCIPLES AND RECOMMENDATIONS.....	6-1
6.1 Policy Principles	6-2
6.2 Biological Principles.....	6-7
7 NEXT STEPS	7-1
8 REFERENCES.....	8-1

APPENDICES

2A Outreach Summary – Meetings and Phone Calls	
2B GIS Database Inventory for the SANBAG Countywide Habitat Preservation/ Conservation Framework study, San Bernardino County	
2C SCAG GIS Database Inventory (Abbreviated*) Compared with Dudek GIS Database Inventory, San Bernardino County	
4A-4B Wildlife and Plant Species Known to Occur in San Bernardino County	

FIGURES

4-1 General Plan Land Use.....	4-9
4-2 Land Ownership	4-21
4-3 USFWS Critical Habitat.....	4-27
4-4 Natural Communities.....	4-33
4-4a Natural Communities - Mountain and Valley Regions.....	4-35
4-5 Habitat Linkages	4-39
4-6 Conservation and Open Space Areas.....	4-43
4-6a Conservation and Open Space Areas - Valley Region	4-45
4-6b Conservation and Open Space Areas - Valley Region	4-47
4-6c Conservation and Open Space Areas - Valley Region	4-49
4-6d Conservation and Open Space Areas - Valley Region	4-51
4-7 Species Occurrence - Valley Region	4-53
4-7a Species Occurrence - Valley Region	4-55
4-7b Species Occurrence - Valley Region	4-57
4-7c Species Occurrence - Valley Region	4-59
4-7d Species Occurrence - Valley Region	4-61

San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development

TABLE OF CONTENTS

	<u>Page No.</u>
5-1 Regions Subareas.....	5-3
5-2 Ecoregion Subareas	5-5
5-3 Watershed Subareas.....	5-7
5-4 Jurisdiction Subareas	5-9
5-4a Jurisdiction Subareas - Mountain and Valley Regions.....	5-11
5-5 Region-Jurisdictions Subareas.....	5-13

TABLES

1-1 County Planning Regions	1-7
2-1 Summary of Outreach Meetings and Phone Calls	2-2
2-4 City, Town, and County General Plan Goals, Policies, and Implementation Measures for Open Space and Conservation, San Bernardino County.	2-17
2-5 City and Town Hillside Ordinance Development Codes that Provide for Hillside Protections, San Bernardino County.	2-20
3-1 Existing Data Gaps for the SANBAG Countywide Habitat Preservation/ Conservation Framework Study, San Bernardino County.....	3-4
4-1 San Bernardino County General Plan Land Use Designations.....	4-7
4-2 Land Ownership.....	4-20
4-3 US Fish and Wildlife Service Designated Critical Habitat.....	4-24
4-4 Natural Communities by Region	4-31
4-5 Habitat Linkages by Region.....	4-37
5-1 Region Subareas Approach Summary	5-16
5-2 Ecoregion Subareas Approach Summary	5-17
5-3 Watershed Subareas Approach Summary.....	5-18
5-4 Jurisdiction Subarea Approach Summary.....	5-19
5-5 Region-Jurisdiction Subarea Approach Summary.....	5-20

San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development

INTENTIONALLY LEFT BLANK

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

1 INTRODUCTION

The Countywide Habitat Preservation/Conservation Framework study (Conservation Framework) is a structured, comprehensive approach to the preservation and conservation of habitat for threatened and endangered species which is beneficial for the health of the environment, the economy, and the citizens of San Bernardino County (County). Much has already been accomplished for habitat preservation and conservation in the form of existing open space and conservation lands in the County. However, conservation planning in the County traditionally has taken place on a more isolated, project-by-project basis, without a comprehensive view of habitat preservation opportunities and priorities countywide. The Conservation Framework study is the first step of many to providing a comprehensive plan for countywide habitat and species conservation. This Conservation Framework is a guidance document outlining the conservation issues and concerns, existing conservation, conservation opportunities, and data gaps associated with current approaches to habitat conservation. The Conservation Framework is intended to help guide the County toward an achievable set of conservation principles and next steps within a suite of possible comprehensive, long term conservation approaches.

This section provides the background which was the impetus for developing the comprehensive Conservation Framework study, the purpose and objectives, the development process, and the organization of this document.

1.1 Background

The Conservation Framework is a product of the San Bernardino Countywide Vision, an effort initiated in 2010 to identify the Vision the community has for its future (San Bernardino County 2011). The Countywide Vision is driven by community input and experts in education, the economy, the environment, public safety, tourism, and community service, and endorsed by the County and the 24 incorporated cities in the County. The Countywide Vision was adopted by the San Bernardino Associated Governments (SANBAG) Board of Directors in June 2011.

The Countywide Vision identified nine elements of a complete, sustainable community: jobs/economy, education, housing, public safety, infrastructure, quality of life, environment, wellness, and image. The Environment Element was summarized as two primary tenets (San Bernardino County 2011):

- “Our location and natural environment are two of our great strengths. We must protect and preserve the terrain and natural amenities with which we are blessed. We shall strive to intelligently manage our resources for habitat preservation, recreation opportunities, resource extraction, alternative energy, future growth, water quality, air quality all within a regulatory framework that does not impede the creation of a sustainable economy.”

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- “We have the opportunity to improve our region’s self-reliance in meeting the needs of our own population, utilizing alternative and renewable energy sources; enhancing water management; encouraging green manufacturing; rewarding sustainable building, and conserving natural resources – all leading to a healthy population with a high quality of life.”

Following adoption of the Countywide Vision, community stakeholders identified priorities and action items for each of the nine elements of complete and sustainable communities and formed Countywide Vision Element Groups. The Environment Element Group identified two initiatives:

1. Compile an inventory of “best practices” that can be used by local governments, special districts, and resource agencies to better facilitate the development review process of proposed projects.
2. Develop a more comprehensive approach to the preservation/conservation of habitat and open space throughout the county.

The first initiative is currently underway by SANBAG and the County. A Business Friendly Best Practices survey of local jurisdictions was completed and published in the Jobs/Economy element of the Countywide Vision (San Bernardino County 2011, San Bernardino County 2014). The best practices focus on development processing, business attraction/retention, and direct business assistance (economic incentives) from the local perspective. They do not yet incorporate initiatives that focus on regional, state, and federal environmental resource agencies. Additional activity on best practices related to these agencies is anticipated as part of the Environment Element group’s future work. This Conservation Framework study will be integrated with the Environment Element Group’s second initiative by providing a structured, more comprehensive approach to habitat preservation/conservation which builds upon the already existing open space and conservation lands within the County. This effort will guide a structured method which differs from the traditional planning approach that focused on isolated, project-by-project habitat and species conservation. No pre-conceived approach or method has been identified by the County prior to this study. A comprehensive conservation approach may utilize one or more possible methods such as larger multi-species habitat conservation planning, a series of smaller, more focused approaches, and/or mitigation banks. SANBAG is the lead agency for the Conservation Framework study.

1.2 Preservation/Conservation Framework Purpose and Objectives

The purpose of this Conservation Framework effort is to provide an outline or structure for the open space and conservation component of comprehensive regional planning in San Bernardino County. The framework provides an approach to guide future conservation efforts that allows for informed and strategic species and habitat conservation that is compatible with economic growth

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

and development within the County. The Conservation Framework outlines existing conservation efforts and biological information, identification of data gaps, evaluation of potential areas for conservation efforts, evaluation of potential subareas for conservation, creation of conservation principles, and recommendations for next steps. This efforts relies on the best available data from federal, state, county, and city databases to assess species and habitats for conservation action, and provide information for future conservation opportunities. This study does not include creation of a Habitat Conservation Plan (HCP) or a California Natural Community Conservation Plan (NCCP), an analysis of Covered Activities, identification of specific lands to be set aside for conservation, or an evaluation of each city, town, or agency for lands to be set aside.

Conservation involves multiple entities including federal, state, and regional agencies, the County, cities, regional districts, land trusts, and other local organizations. The Conservation Framework helps to coordinate conservation efforts among these agencies and non-government sectors, and more effectively allocate resources for the most productive conservation outcomes. There is a wealth of existing information on biological resources in the County. Therefore, this document also aims to gather and synthesize this information to set the foundation from which a future conservation strategy can be developed as part of the County's Comprehensive Regional Plan.

The four objectives of this Conservation Framework study are to:

1. Work with the stakeholder group established for the Environment Element of the Vision to develop a countywide habitat preservation/conservation framework. The framework will include principles that guide habitat conservation/preservation within logical subareas of the county.
2. Build on conservation/preservation initiatives already established or in progress, beginning with an inventory of those initiatives.
3. Develop the framework in a way that identifies and meets regulatory and legal requirements and provides balance among the various environmental, lifestyle, and economic needs and interests represented in the county.
4. Identify subsequent steps and commitments that would be necessary to proceed with further development of the framework, including identification of gaps and processes for establishment, restoration, and maintenance of preserves and habitat conservation areas.

The terms “preservation” and “conservation” are often used interchangeably, however these terms represent different land management methods that vary by the level of species or habitat protections and the types of actions allowed within an area. *Preservation* refers to setting aside natural resources to restrict use, activities, or contact by people to prevent damage to habitat

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

and/or wildlife. *Conservation* refers to sustainable development such that environmental resources are used and managed in a responsible manner to ensure its continued existence for future generations. Unless otherwise stated, for ease of use the remainder of this document will use the term “conservation”, defined broadly to refer to either preservation or conservation with varying levels of species and habitat protections, allowable and sustainable human use and contact, and land designations.

1.3 Conservation Framework Development Process

The Conservation Framework was developed through a step-wise process in conjunction with the Environment Element Group (EE Group) and the SANBAG Planning and Development Technical Forum (PDTF). In addition to ensuring compliance with regulatory and legal requirements, a primary component in the development of the Conservation Framework was community and stakeholder outreach to solicit input on existing information and desired outcomes or potential conservation mechanisms. Development of the Conservation Framework included the following steps:

1. Compile and map existing biological resources, habitat communities, open space/conservation lands, and mitigation lands data from federal, state, regional and local entities.
2. Document data gaps.
3. Prepare a Habitat Conservation Constraints analysis.
4. Establish and map proposed subareas.
5. Establish open space/conservation principles at both the countywide and subarea levels.
6. Identify next steps and commitments necessary to implement the Conservation Framework.

Step 1 – Compile Existing Data

A substantial amount of land has already been dedicated to open space and conservation in San Bernardino County. This important first step documents existing open space/conservation areas, conservation/mitigation activities currently underway, and opportunities identified by County agencies for additional open space/conservation efforts. Currently available Geographic Information Systems (GIS) data was compiled which include vegetation communities, species occurrences, designated Critical Habitat, National Forest Service lands, National Park Service lands, National Preserves, Bureau of Land Management (BLM) lands, habitat preserves and refuges, wildlife corridors, soils, existing and planned land use, and land ownership. In addition, there are existing Protected Areas Databases (PAD) with GAP codes that provide an indication of the protections afforded areas and resources. Data was either publicly available or was

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

solicited from SANBAG, the current Southern California Association of Governments (SCAG) contractor, the County, Cities, the California Department of Fish and Wildlife (CDFW), the U.S. Fish and Wildlife Service (USFWS), the U.S. Forest Service (USFS), the National Park Service (NPS), the BLM, and other local and regional entities.

In addition, information from local jurisdictions was gathered through meetings and correspondence. Local jurisdictions included the County, cities, water districts, the County Flood Control District, the Inland Empire Resource Conservation District (IERCD), key members of the development community that either have large landholdings or projects that have significant amounts of open space set-asides, and conservation/non-governmental organizations. The meetings and correspondence served to gather information about existing conservation/mitigation activities, conservation easements, mitigation banks, existing and planned HCPs/NCCPs, preserve management/monitoring plans, and General Plan open space elements and ordinances. These meetings helped refine mapping of existing open space and conservation lands and provided information on other conserved lands not included in previous mapping efforts. This existing information is contained within a GIS data catalog, an inventory database, and maps, and is described in Sections 2 and 4 of this document. The data was used as the foundation to inform the remaining steps of the Conservation Framework development process.

Step 2 – Document Data Gaps

Using the data assembled during Step 1 of the Conservation Framework process, data gaps were identified. Data gaps are associated with incomplete information pertaining to the following:

- Biological Resources: incomplete survey data.
- Open Space and Conservation Areas: incomplete information regarding the location/boundaries, acreages, and/or management plans of open space and park areas, conservation/preserve areas, conservation easements for mitigation, and HCP/NCCPs which were established for public use, protection of habitats and species, or as mitigation for impacts to species, habitat, and/or water resources associated with development projects.
- Outreach to Jurisdictions and Agencies: incomplete response from all cities in the County and agencies and/or incomplete or unavailable data for conservation lands, activities, or planned mitigation needs.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

Data gaps were considered when identifying issues, opportunities, and concerns associated with current approaches to habitat conservation and were used to help form recommendations for the next steps needed to implement the Conservation Framework.

Step 3 - Prepare a Habitat Conservation Constraints Analysis

A Habitat Conservation Constraints analysis was prepared which includes a discussion of the regulatory and planning context related to biological and open space conservation, a landscape-scale summary of the biological resources in the County, and considerations relevant to development of the Conservation Framework. This analysis is intended to facilitate the development of the conservation principles and recommendations for future phases of implementing a comprehensive Conservation Plan. This information was used to identify the issues, opportunities, data gaps, and concerns associated with current approaches to habitat conservation.

Conservation opportunities and gaps in resource protection occur where there is known biological conservation value (e.g., habitat for endangered species, mapped rare natural communities, or important ecological processes) and lack of legislative or legal protection. A large portion of the SANBAG planning area is composed of federal lands administered by the NPS, BLM, or the Department of Defense (DoD). Outside of these federal lands and other state-owned lands, opportunities for conservation occur where biological conservation value is high. Biological resources information was overlaid with protected lands and ownership data to identify the conservation opportunities. Each conservation opportunity area was mapped and the resources described within each conservation opportunity area.

An overview of the regulatory environment within which protection for land use activities and endangered species can occur was also prepared. This includes a summary of Sections 7 and 10 of the federal Endangered Species Act (ESA), the California Endangered Species Act (CESA), California Fish and Game Code and the Natural Communities Conservation Plan Act. In addition, the advantages/disadvantages and development timelines of preparing a regional HCP and/or HCP/NCCP in place of utilizing project-specific permitting tools as allowed through Section 7 of the ESA and Section 2081 of the CESA was summarized.

Step 4 – Establish and Map Subareas

The scope of this study encompasses the entirety of the County which includes three diverse Planning Regions: Valley, Mountain, and Desert (Table 1-1; County of San Bernardino 2007). These distinct regions represent broad biogeographic differences, varying by topography, climate, and biological resource assemblages as well as their unique economic and social issues and opportunities. Large-scale conservation planning often uses subareas to address diverse

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

resources and issues to effectively focus elements of a conservation strategy. Subareas were identified based on reasonable and appropriately sized areas which considered geography, jurisdictional boundaries, and natural conditions. The subarea analysis identifies a set of potential approaches to subdividing the San Bernardino County planning area, establishes the criteria used to evaluate the utility of the identified subarea options, and evaluates the potential subarea approaches to use for the Conservation Framework.

**Table 1-1
County Planning Regions**

Planning Region	Total Area (sq. mi.)	Jurisdiction
Desert	18,735	Adelanto
		Apple Valley
		Barstow
		Hesperia
		Needles
		Twentynine Palms
		Victorville
		Yucca Valley
Mountain	872	Big Bear Lake
Valley	500	Chino
		Chino Hills
		Colton
		Fontana
		Grand Terrace
		Highland
		Loma Linda
		Montclair
		Ontario
		Rancho Cucamonga
		Redlands
		Rialto
		San Bernardino
		Upland
Yucaipa		

Source: County of San Bernardino 2007

Five potential subarea approaches were identified and evaluated: regional boundaries (biogeographic), ecoregional boundaries (biogeographic), watershed boundaries (hydrologic), jurisdictional boundaries (cities), and combined biogeographic and jurisdictional boundaries (regions and cities combined). Primary criteria used to evaluate the effectiveness of each

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

potential subarea approach include usefulness and practicality. Based on the analysis, a recommended subarea approach is discussed.

Step 5 – Conservation Principles and Recommendations

In coordination with the PDTF and the EE Group, a set of Conservation Principles were developed to provide guidance on the larger-scale considerations related to future conservation planning on both the countywide and subarea level. The Principles were allocated to two focal topics - policy and biology- and were based on established conservation biology tenets while taking into consideration existing and ongoing initiatives in the County, economic development concerns, and information gathered from the various entities/stakeholders. These guiding principles outline the basic goals or parameters for conservation in each subarea, providing a basic framework for what is important and what is not. The principles also include a recommendation for the potential tool or sets of tools that could be used to acquire conservation lands in the future. These Principles will be used to guide development of more comprehensive subsequent phases of a Conservation Plan.

Step 6 – Next Steps and Commitments

The final step in the Conservation Framework development process includes a discussion of the next steps and commitments necessary to continue the momentum proceeding to the next level or phases of a more comprehensive, countywide conservation strategy. A list of next steps on a countywide and subarea level is provided. The entity responsible for the next step, the proposed schedule for the next steps to be implemented, and personnel and financial resources needed for each of the next steps are identified. These next steps were developed in coordination with SANBAG, the PDTF, the EE Group, elected officials, local agency staff, resource agencies, environmental stakeholders, and the development community to ensure that the next steps can be advanced.

1.4 Document Organization

Organization of this document includes the following sections:

- Section 1 provides an introduction to the study background, purpose and objectives, and development process.
- Section 2 describes the outreach conducted to gather data, the available existing data, and development of the database.
- Section 3 presents and summarizes the data gaps identified during the data gathering process.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- Section 4 presents the habitat conservation constraints analysis, including discussion of the regulatory and planning context, the biological resources in the County, and other considerations relevant to development of the Conservation Framework.
- Section 5 provides an analysis of potential approaches for establishing subareas according to the County's diverse biogeographic and biological resource features.
- Section 6 describes the policy-related and biological resource-related Conservation Principles that provide guidance for future conservation planning on both the countywide and subarea level.
- Section 7 describes the next steps necessary for implementing a comprehensive, countywide conservation strategy.
- Section 8 contains a list of references cited in this document.

San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development

INTENTIONALLY LEFT BLANK

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

2 OUTREACH AND DATA GATHERING

This section provides a discussion of outreach efforts to jurisdictions including the County, cities/towns, water districts, the County Flood Control District, the IERCD, and non-governmental organizations or other stakeholders. It also presents the existing data that was available to compile a database of biological resources and conservation areas.

2.1 Outreach

An important part of this study was to gather available information related to existing conservation practices and efforts by the local jurisdictions and various conservation agencies in San Bernardino County. Understanding the attitudes of these entities was also an important part of the outreach process. The outreach portion of this study included issuing and collecting written questionnaires/surveys, meetings and correspondence with representatives from County jurisdictions and conducting presentations at the PDTF, the EE Group, and the Local Agency Formation Commission for San Bernardino County (LAFCO).

The purpose of the outreach effort was to provide transparency in the development process by involving all stakeholders. This effort was intended to gather information not otherwise available and to elicit input to understand the various jurisdictions' current conservation approach, conservation needs, and vision for what a future, unified conservation strategy may include. The goal was to encourage participation and cooperation of stakeholders to aid in moving the strategy from a framework planning phase toward future implementation phases.

Written questionnaires/surveys were disseminated to the PDTF and EE Groups on April 23 and April 30, 2014, respectively, by Dudek. The questionnaires were handed out to attendees at each of these two meetings. At each meeting, the attendees were asked to write their ideas related to the following questions: 1) Things that will get better with Conservation Planning; 2) Things that will be challenging with Conservation Planning; 3) Things you want from this Study; and 4) Tell us what initiatives you are involved with that are related to Conservation Planning. The first two questions were intended to solicit attitudes towards conservation planning. The third question was intended to provide insight into what constituents were looking for from the framework study. The last question was intended to collect information and/or direct efforts of where to go for information on existing conservation efforts.

The returned questionnaires helped inform and guide this study. Most people think there are good as well as challenging aspects to conservation planning and balancing conservation with development was a common discussion topic for most of the returned questionnaires. The

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

questionnaires were helpful in directing data-gathering efforts and highlighting specific efforts by various agencies related to conservation planning.

Individual or group outreach meetings and phone calls were held from May to August 2014. Group outreach meetings to towns and cities, the resource agencies, water conservation districts, and other groups were organized according to the planning region jurisdictions or individually and held in a central location. A meeting request was sent to all jurisdictions via email and a date and location agreed upon by all respondents interested in attending. Phone call discussions with DUDEK were arranged individually with interested entities. A general meeting agenda was distributed to help guide the topic discussions during meetings. Available data on existing or planned conservation efforts was requested from each agency and jurisdiction via email and during meetings and phone calls. Table 2-1 lists the outreach meetings and phone call information including date, location, attendees, and representatives.

**Table 2-1
Summary of Outreach Meetings and Phone Calls**

Meetings				
<i>Planning Region</i>	<i>Date / Location</i>	<i>Invited Jurisdiction</i>	<i>Attended</i>	<i>Representative</i>
<i>LAFCO</i>				
All	May 7, 2014; SANBAG office	LAFCO	Yes	Kathleen Rollings-McDonald, Samuel Martinez
<i>Towns/Cities</i>				
Desert and Mountain	May 21, 2014; Town of Apple Valley Town Hall	Adelanto	Yes	Mark de Manincor
		Apple Valley	Yes	Lori Lamson
		Barstow	Yes	Jennifer Riley
		Hesperia	No	–
		Needles	No	–
		Twentynine Palms	No	–
		Victorville	Yes	Michael Szarzynski
		Yucca Valley	Yes	Shane Stueckle
		Big Bear Lake	Yes	James Miller
Valley (East)	May 28, 2014; City of Highland Town Hall	Colton	Yes	Mark Tomich
		Grand Terrace	No	–
		Highland	Yes	Lawrence Maine, Sergio Madera
		Loma Linda	No	–
		Redlands	Yes	Kalani Paitoa
		Rialto	No	–
		San Bernardino	No	–
Yucaipa	Yes	Joe Lambert		

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

**Table 2-1
Summary of Outreach Meetings and Phone Calls**

Meetings				
<i>Planning Region</i>	<i>Date / Location</i>	<i>Invited Jurisdiction</i>	<i>Attended</i>	<i>Representative</i>
Valley (West)	May 29, 2014; Rancho Cucamonga City Hall	Chino	No	–
		Chino Hills	No	–
		Fontana	Yes	Shannon Casey
		Montclair	No	–
		Ontario	Yes	Richard Ayala
		Rancho Cucamonga	Yes	Tom Grahn
		Upland	No	–
<i>County</i>				
All	May 29, 2014; County of San Bernardino offices	County Department of Public Works	Yes	Kevin Blakeslee, Gerry Newcombe
		Land Use Services	Yes	Gia Kim, Terri Rahhal, George Kenline, Tom Hudson
		Special Districts	Yes	Jeff Rigney
<i>Wildlife Agencies and SCAG</i>				
All	June 11, 2014; SCAG Riverside office	U.S. Fish and Wildlife Service	Yes	Karin Cleary-Rose
		California Dept. of Fish and Wildlife	Yes	Leslie MacNair
		SCAG	Yes	Kristen (Torres) Pawling
<i>Water Conservation Districts</i>				
All	July 24, 2014; SANBAG office	San Bernardino Valley Water Conservation District	Yes	Daniel Cozad
		San Bernardino Valley Municipal Water District	Yes	Douglas Headrick
<i>Conservation Districts</i>				
All	August 19, 2014; DUDEK Riverside office	Inland Empire Resource Conservation District (IERCD)	Yes	Mandy Parkes
Phone Calls				
<i>Planning Region</i>	<i>Date</i>	<i>Jurisdiction</i>	<i>Attended</i>	<i>Representative</i>
<i>Towns/Cities</i>				
Desert	June 2, 2014	Hesperia	n/a	Dave Reno, Scott Priester
Valley	June 3, 2014	Chino Hills	n/a	Joann Lombardo
<i>County (Transportation Projects)</i>				
All	June 4, 2014	SANBAG	n/a	Paula Beauchamp, Julie Vandermost (consultant to SANBAG), Steve Smith, Josh Lee
<i>Development Company</i>				
All	July, 16, 2014	Southern California Gas Company	n/a	Justin Meyer

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

**Table 2-1
Summary of Outreach Meetings and Phone Calls**

Phone Calls				
<i>Planning Region</i>	<i>Date</i>	<i>Jurisdiction</i>	<i>Attended</i>	<i>Representative</i>
<i>Resource Agency</i>				
Desert/Mountain	August 6, 2014	Bureau of Land Management	n/a	Terri Raml, Russell Schofield
<i>Conservation Districts</i>				
Desert	August 20, 2014	Mojave Desert Resource Conservation District (MDRCD)	n/a	Janet Lindgren

A brief summary of the information gathered and input received from each jurisdiction or entity is discussed below, with a more detailed description of the meetings and phone call outcomes provided in Appendix 2-A. In addition, presentations on the Conservation Framework effort were given to the PDTF on April 23 and August 27, 2014; the EE Group on April 30 and September 24, 2014; the SANBAG Board on September 3, 2014; and LAFCO on September 17, 2014.

Local Agency Formation Commission (LAFCO) Meeting – May 7, 2014

- Discussed conservation framework study objectives
- Discussed LAFCO efforts related to conservation planning
- Discussed CSA 120 and its status and background

Desert and Mountain Cities Meeting – May 21, 2014

- Development and conservation potential was discussed with each city.
- Wildlife movement corridors in desert habitat was discussed, particularly in regards to proposed open space/conservation areas.
- Adelanto, Victorville, Barstow, Yucca Valley have large open space and/or conservation areas or wildlife linkages as part of General Plan updates or specific plans.
- City of Big Bear has open space or conservation lands on Flood Control properties and mitigation lands associated with individual projects which are managed by the IERCD. Big Bear has nearly reached its maximum build-out or growth capacity.
- Town of Apple Valley is in the process of preparing an HCP.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

East Valley Cities Meeting – May 28, 2014

- Conservation associated with previous, current, and future development projects was discussed.
- Cities are interested in identifying consolidated open space areas that multiple jurisdictions could use for future mitigation needs.
- Hillside ordinances that result in open space.
- Santa Ana River current and future development pressures.
- Conservation lands associated with the Delhi Sands Flower-loving Fly (federally listed species).
- Potential for additional open space adjacent to Forest Service or State Park lands in Highland and Yucaipa.

County Meeting – May 29, 2014

- Department of Public Works has mitigation areas related to past projects.
- Flood Control owns land in the County that is considered open space. Some open space lands will be used for mitigation for their USACE and CDFW programmatic permits.
- Large developments currently being planned will require conservation set asides near Lytle Creek and Cajon Creek.
- County Transportation has no plans for any new major roads that would need significant conservation requirements. Route 66 will require future bridge repairs. This will require considerable conservation mitigation needs.
- No significant conservation needs are expected in association with landfill expansions.
- Vulcan mitigation bank was discussed.
- County Special Districts provided an overview of their role related to the Etiwanda Preserve and LAFCO's CSA 120 conservation area. An additional area near Joshua Tree may be considered by Special Districts for conservation using the same conservation model as CSA 120.
- IERCD and County Special Districts have an overlap of potential conservation services in the County. One current method for applicants to mitigate project impacts is to set up a CSA or go to IERCD.
- The potential for BLM lands to be used for potential mitigation, or retirement of grazing allotments and mining rights was discussed.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- A vacant lands inventory was completed by the County which would provide valuable information towards this Conservation Framework study.

West Valley Cities Meeting – May 29, 2014

- Each jurisdiction discussed Development projects and conservation efforts.
- City of Fontana discussed their Delhi Sands Flower-loving Fly HCP and other mitigation areas.
- City of Ontario does not have significant open spaces areas. The New Model Colony annexation did require some mitigation which was to take place near Prado Basin but has not yet occurred.
- City of Rancho Cucamonga does not have conservation in its City limits, aside from County Flood Control lands. There is potential for conservation within its Sphere along the northern boundary. IERCD currently manages mitigation for projects, which works well. The City has concerns over the long term viability of CSA 120.
- Cities of Fontana and Rancho Cucamonga have Hillside Ordinances.
- Other entities to follow up with related to conservation efforts near and in Rancho Cucamonga include Cucamonga Water District, San Antonio Water Company and City of Los Angeles.

City of Hesperia – June 2, 2014

- City of Hesperia had negative experiences with previous conservation planning efforts, specifically the West Mojave Plan and the Summit Valley HCP.
- The City is opposed to and would not support any regional HCP planning efforts.
- The City prefers to proceed with conservation and mitigation planning on a project-by-project basis.
- The City requests avoidance as the first measure if conservation is required for projects. Any conserved lands or set asides are given to non-profit or land conservation entities.
- Currently there are no conservation easements in the City. There is only one 11-acre site that has been set aside for 404 waters permitting mitigation.

City of Chino Hills – June 3, 2014

- The City of Chino Hills is almost at build out.

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

- There are currently about 3,000 acres of city-owned open space and 2,000 acres of HOA-owned open space lands mainly focused in the hillside areas.
- A City development code requires open space set-asides based on slope. Proposed future developments in hillside areas would be required to set aside a portion of the project for open space.
- There are long term funding issues for open space areas.
- County-wide conservation efforts related to funding for maintenance and management of open space lands is of interest to the City.

SANBAG Internal Meeting – Transportation Projects – June 4, 2014

- Mitigation banks have been used previously as preferred species mitigation methods. Mitigation banks that have been used include Vulcan in Cajon Creek, and Wildlands Mitigation Bank near Cajon Creek and Lytle Creek.
- Use of Flood Control property for SANBAG mitigation has not worked well.
- Land Veritas Corp. is proposing a mitigation bank in Chino Hills.
- SANBAG projects typically result in impacts to San Bernardino kangaroo rat (listed species) and Waters of the US.
- Riverside-Corona Resource Conservation District (RCRCD) and Santa Ana Watershed Agency (SAWA) have been used for mitigation. SANBAG can provide data on previous and future project impacts and mitigation.
- SANBAG plans to use mitigation banks in the future. They have considered setting up their own mitigation bank for future project needs.
- Caltrans has a list of their project-related mitigation areas.

Wildlife Agencies – June 11, 2014

- The USFWS and CDFW (Wildlife Agencies) understand the intent of the SANBAG Conservation Framework project.
- USFWS observations that San Bernardino County's main impacts to species would likely be from water infrastructure projects.
- There are no large proposed or foreseeable future transportation projects that would be an impetus for large amounts of conservation mitigation. Improvements to bridge culverts and underpasses should be incorporated into any future transportation projects.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- Flood control activities may require attention related to species mitigation.
- The two main HCPs in the Valley area were discussed – the Santa Ana River HCP being prepared by the water districts to cover Santa Ana Sucker and other species, and the “Wash Plan” prepared for the gravel mines in the Santa Ana River near Highland.
- Prado Basin was discussed in relation to connectivity to Chino Creek and how a regional conservation scenario that includes Riverside County is appropriate to understand.
- Species and habitat that commonly need mitigation through the CEQA process in San Bernardino County are burrowing owl, golden eagle and alluvial fan sage scrub. The jurisdictions may want to consider proactive ways to mitigate for these species/habitat ahead of time. A unified CEQA approach may be considered.
- Funding of conservation areas is also an area identified by the Wildlife Agencies that needs improvement or thought in future conservation planning.
- Mitigation Banks that the Wildlife Agencies were aware of were discussed (Vulcan’s Cajon Creek Mitigation Bank and Wildlands Mitigation Bank near the confluence of Cajon Creek and Lytle Creek, a proposed mitigation bank in Chino Hills area).
- Cross-jurisdictional mitigation and its appropriateness in certain circumstances was discussed. It would be appropriate where biology, ecology, and politics will support it.
- There was discussion about the definitions of “open space” and “conservation”. Public access and its importance and appropriateness was discussed. The desire for community involvement was also discussed.
- A brief list of “best practices” was provided by the Wildlife Agencies: brief the regulatory agencies early; do not piecemeal the regulatory agency engagement; do not minimize the appearance of project impacts or try to do things that are not practical to avoid impacts; be straightforward with what the impacts are, and what the mitigation is; prepare adequate CEQA documents for projects that will need regulatory permits or approvals.
- SCAG has a nearly-completed conservation planning study which will have its own “best practices” list. The value of local jurisdictions or project proponents funding “reimbursable employees” at a regulatory agency was discussed.
- The potential of implementing “Pre-Application Meetings” similar to what is done in western Riverside County to involve regulatory agencies was discussed.
- USFWS noted that there are areas of known Bald Eagle nesting (Highland area) outside of Forest Service ownership as well as for the unarmored threespine stickleback

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- BLM provided clarification about existing Areas of Critical Environmental Concern (ACEC) designations. The ACEC designation does indicate a level of biological conservation amongst BLM lands.

Inland Empire Resource Conservation District (IERCD) – August 19, 2014

- Information was provided on IERCD’s involvement with conservation efforts in the County.
- IERCD provided information on their current activities which include collecting and managing fees for conservation endowments, and holding conservation easements.
- IERCD is in the process of preparing their own In Lieu Fee Program.
- IERCD is interested in a multi-jurisdictional cooperative for conservation planning.

Mojave Desert Resource Conservation District (MDRCD) – August 20, 2014

- MDRCD does not own or hold easements for land conservation.
- MDRCD conducts removal of invasive species along the Mojave River for projects and entities needing waters permitting.

2.2 Data Gathering and Database Development

This section summarizes the existing information gathered to support development of a comprehensive countywide conservation plan. The purpose of the data gathering effort was to compile an inventory of readily available information relevant to conservation planning which includes a GIS database and additional information on open space and conservation efforts from jurisdiction General Plans and Hillside Ordinances. and other information from jurisdictions not otherwise in GIS format. This inventory serves as a repository for currently available data that can be used as the baseline for conducting future GAP analyses and developing a conservation reserve design (see Section 7 Next Steps). A description of the data gathering methods, results of what data is readily available, and a summary of the primary data sources is presented below.

Methods

Dudek identified and compiled available data from a variety of public and private sources that document existing conservation lands, conservation easements, critical habitat, mitigation banks, and other designations intended to preserve open space, habitat, and sensitive species. A substantial amount of information is available through prior efforts and existing GIS data maintained by SCAG, the County, SANBAG, and State and Federal resource agencies. Dudek initially leveraged their already robust GIS database containing biological and resource

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

(fish)(Big Bear Lake area). USFWS also discussed the Shay Pond project which supports stickleback. These areas should be considered in future conservation scenarios.

Southern California Gas Company – July 16, 2014

- So Cal Gas does not own excess lands intended for conservation purposes.
- Most projects that require mitigation are in the high desert.
- They use IERCD and Mojave RCD for Waters mitigation.
- Most projects require mitigation for desert tortoise. They use existing programmatic permits with BLM/USFWS and an MOU with CDFW. So Cal Gas provides funds directly to BLM and CDFW for mitigation for ESA issues.
- So Cal Gas would be interested in a county-wide regional conservation plan because it would provide an additional mitigation option.

San Bernardino Valley Water Conservation District (WCD) and San Bernardino Valley Municipal Water District (MWD) – July 24, 2014

- Both Districts are preparing HCPs: the “Wash Plan” is being proposed by WCD and the “Upper Santa Ana River” HCP is being proposed by MWD.
- The details of each HCP was discussed. The Wash Plan is comprised of public agencies and will include land swaps to facilitate more conservation and allow projects to move forward. A Task Force has been established to oversee Plan implementation. The Upper Santa Ana River (SAR) HCP is not a land consumptive HCP, but rather a waters-specific plan.
- MWD shared insights about their working relationship with the US Fish and Wildlife Service. Other funding-related insights and implementation recommendations were discussed.

BLM – August 6, 2014

- Background on the Conservation Framework study was provided to BLM.
- BLM was interested in how a county-wide conservation strategy would interface with the Desert Renewable Energy Conservation Plan (DRECP). Portions of the draft DRECP would likely be helpful to the SANBAG study (e.g., the No Action Alternative would provide explanations about BLM land uses and designations, the General Conservation Plan within the DRECP is intended to provide a programmatic framework of Habitat Conservation Plans).

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

information relevant to the conservation framework study that had been developed from other projects. Dudek then augmented the initial GIS database with publically available information and information provided by the various County agencies, State and Federal agencies, jurisdictions, and other entities.

An important component of the data gathering effort included coordinating with SCAG and its environmental consultant working on data gathering and mapping for the region under the contract *Regional Habitat Conservation – Assessment Methodology & Database for 2016 RTP Development*. SCAG’s data inventory and mapping effort is intended to expand their GIS database for resources relevant to natural resources planning for open space in the SCAG region (Leidos 2014) and therefore parallels the data gathering effort required for this conservation framework study. To avoid duplication of effort, Dudek partnered with SCAG to obtain their completed GIS inventory database (received by Dudek August 2014).

In addition, GIS data coverages and hard copy maps and tables received as a result of outreach efforts and information requests to the various county jurisdictions and state and federal agencies as discussed in Section 2.1 were incorporated into the Dudek data inventory. In some instances, hard copy maps of open space and/or conservation areas provided by jurisdictions were digitized for inclusion in the GIS database. The data inventory includes existing publically available data from online sources and data coverages received after submittal of specific data requests. Some databases are easily searchable through online interfaces and therefore were not downloaded but are listed in the SCAG inventory (Leidos 2014). No new field data collection or data analysis was included as part of this conservation framework study.

Conservation and open space preservation opportunities exist in jurisdiction General Plans and Hillside Ordinances. General Plan Conservation/Open Space Elements identify policies and implementing measures for protection of environmental resources and some jurisdictions maintain Hillside Ordinances which include development standards for hill slopes to preserve open space. While General Plans and Hillside Ordinances provide a potential avenue for obtaining conservation and open space areas, these policies do not include a mechanism to guarantee long-term protection in perpetuity. Though these measures are not currently in digital GIS coverage format, Dudek summarized these important components of a countywide conservation approach.

Dudek created a GIS database inventory table which includes the following information for each data source:

- Source category (e.g., Federal, State, County, City/Town, Resource Conservation District, Environmental Group/Non-profit organization, and Private);

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- Source name;
- Name of database;
- Year;
- Relevancy; and
- Description of the data layer.

For consistency, Dudek incorporated the same data relevancy ranking used in the SCAG inventory effort which are: (Leidos 2014):

- Rank 1: Directly Useful. Can be used to assess habitat or ecosystem conditions or functions in a spatial context. Examples include vegetation maps, wildlife habitat maps, soil surveys, and fire risk maps;
- Rank 2: Indirectly Useful. Can be used for land use planning or impact predictions related to habitats and ecosystems. Examples include planning boundaries related to natural resources, land use designations, and management designations; and
- Rank 3: Little or No Use. Not related to or only tangentially related to identification or assessment of impacts on natural resources. Examples include political boundaries, U.S. Census data, employment data, and earthquake faults.

In addition to the GIS database inventory spreadsheet, a GIS data catalog and a documentation library has been provided to SANBAG in electronic format under separate cover as a component of this conservation framework study.

Results and Summary

The GIS database inventory of existing, readily available environmental resources data compiled by Dudek is listed in Table 2-2, Appendix 2-B. This inventory presents the baseline GIS information that can be used to support a countywide conservation plan, including a future Gap Analysis and development of a Reserve Design. Existing available GIS data compiled by Dudek includes seven federal agencies; two state agencies; six county agencies, districts, or organizations; six cities/towns; one Resource Conservation District; five environmental groups/non-profit organizations; and two private companies. The data includes natural resources such as vegetation communities (Figure 4-4 and 4-4a), species occurrence coverages (Figure 4-7 series), USFWS listed species designated Critical Habitat (Figure 4-3 and 4-3a), conservation and open space areas (e.g., federal and state lands, habitat management areas, preserves, wilderness areas; Figure 4-6 series), wildlife corridors/habitat linkages (Figure 4-5), existing and planned land use (Figure 4-1), and land ownership (Figure 4-2). In addition, there are existing

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

Protected Areas Databases (PAD) with GAP status codes that provide an indication of the protections afforded areas and resources. The following provides a summary of the primary data sources and GIS coverages which are presented in Table 2-2, Appendix 2-B:

- Federal - Bureau of Land Management
 - Wilderness Areas
 - Wildlife Habitat Management Areas
 - Areas of Critical Environmental Concern
 - Species Conservation Areas
 - Off-Highway Vehicle Areas
 - Plant, Bird, and Mammal Occurrence data
- Federal - Federal Emergency Management Agency
 - National Flood Hazard Layer
- Federal - Natural Resources Conservation Service
 - Soils (SSURGO database)
- Federal - U.S. Department of Agriculture
 - Ecoregions
- Federal - U.S. Fish and Wildlife Service
 - Designated Critical Habitat
 - National Wildlife Refuges
 - National Wetlands Inventory
 - HCP Boundaries
 - Listed and Sensitive Species Occurrence Data
- Federal - U.S. Forest Service
 - Plant and Wildlife Species Occurrence Data on National Forests
- Federal - U.S. Geological Survey
 - CA GAP Vegetation
 - National Hydrography Dataset
- State - California Department of Fish and Wildlife

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- California Natural Diversity Database (CNDDDB)- Plants and Animals
- Vegetation
- California Essential Habitat Connectivity
- California Wildlife Habitat Relationships (CWHR)
- Owned and Operated Lands
- State - California Department of Water Resources Vegetation
 - Groundwater Basins
- County - Flood Control District
 - Flood Control District parcels
- County - Land Use Services
 - Vacant Land Survey Data
- County – LAFCO
 - CSA 120 and CSA 70 Conservation Areas
- County - SCAG
 - Land Use Data
- County - San Bernardino County Museum
 - Species and Habitat Occurrence Datasets
- San Bernardino Valley Water Conservation District
 - Upper Santa Ana River Habitat Conservation Plan
- Cities and Towns
 - Various open space, conservation areas, wildlife connectivity areas, proposed development areas
- Resource Conservation District – IERCD
 - Mitigation Areas
- Environmental Group/Non-profit - Audubon
 - Important Bird Areas
 - eBird Occurrence Data
 - Christmas Bird Count Data

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

- Environmental Group/Non-profit - GreenInfo Network
 - California Protected Areas Database (CPAD)
 - California Conservation Easement Database (CCED)
- Environmental Group/Non-profit - HerpNet
 - Herpetological Occurrences from Museum Records
- Environmental Group/Non-profit – Hills for Everyone
 - California State Parks lands
- Environmental Group/Non-profit - South Coast Wildlands
 - South Coast Missing Linkages Project - Wildlife Corridors
 - California Desert Connectivity Project - Desert Linkage Network
 - Joshua Tree-Twenty-nine Palms Connection - Wildlife Corridors
- Environmental Group/Non-profit - U.S. Endowment for Forestry and Communities, Inc.
 - National Conservation Easement Database (NCED)
- Private – Vulcan Materials Company
 - Conservation Lands and Mitigation Bank

The combined efforts of SCAG and Dudek have resulted in a more complete dataset. A comparison of the data compiled for the SCAG inventory of natural resources data (Leidos 2014) and the data compiled by Dudek for this conservation framework study is summarized in Appendix 2-C (Table 2-3).

A summary of the General Plan policies and Hillside Ordinances of local jurisdictions are presented in Table 2-4 and Table 2-5, respectively. Additional discussion of the relevancy of these jurisdiction plans and policies to a conservation strategy is provided in Section 4.1.3.

Data Limitations

When applying available data to conservation planning and analyses, it's important to understand the limitations and appropriate uses associated with each data source. All data have limitations; therefore understanding the limitations allows one to minimize error and assess the validity of analyses (Ardron et al. 2010). As is common for natural resource data, the existing available information gathered for this conservation framework study come from multiple sources and are of varying quality and/or quantity. The following provides a summary of the primary data limitations associated with the existing data:

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- Incomplete or missing metadata: Ideally, data sources are received with metadata or “data about the data” which describes the contents, year, collection methods, or other descriptive details about the original data/files thereby increasing the usefulness of the data. Not all data sources have complete metadata.
- Data quality/accuracy: Data quality varies such that not all data is of the highest possible quality (e.g., point data derived from a verified source and/or based on sub-meter accuracy GPS location data) or the data is of unknown quality/accuracy.
- Incomplete and/or inconsistent datasets: Datasets may be reported inconsistently across regions, data may be lacking from some regions but not others, data may be available for certain features (e.g., species, habitats) but not others, and data may be collected at varying temporal and/or spatial scales. Existing data is often available based on where there was a survey opportunity due to a specific question or development purpose, and legal access to lands. The lack of data in an area does not indicate an absence of biological resources and potential conservation value (Braden et al. 2009).
- Scale varies among data sources: Some datasets represent information collected or applicable only for landscape-scales or course-grained scales. This is relevant when seeking appropriate datasets for site-specific or local information to perform a fine-scale analysis.

Future conservation planning, analyses, and reserve design (see Section 7 Next Steps) will need to understand what each data source supplies to an analysis to achieve quality results. Section 4.2.1 provides an additional discussion of data limitations associated with available plant and wildlife species and habitat occurrence data.

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

**Table 2-4
City, Town, and County General Plan Goals, Policies, and Implementation Measures
for Open Space and Conservation, San Bernardino County.**

Jurisdiction	Year	General Plan Chapter/Element	General Plan Goals and Policies	Implementation Plans/Measures
Adelanto	1994	Chapter 7	Policies 1.1–1.5	Development of comprehensive parks, recreation, and open space plan
Apple Valley	2009	Chapter III	Policies 1.B–1.D, 2.A–2.D, 3.A–3.B, 4.A–4.C, 5.A–5.B	Various efforts to preserve habitat and open lands (MSHCP), and reduce development footprints
Barstow	1997	Chapter V	Policies V.1.2–V.1.8	Participation in the West Mojave Plan; No specific city conservation plans/areas
Big Bear Lake	1999	Open Space, Parks, and Recreation Element	Goal OPR 3, Policy OPR 3.1–3.4	Possibility of property acquisition for open space conservation (GP policy OPR 3.4)
Chino	2010	Chapter 9	Objectives OSC 1.1–1.2, 2.1–2.3	Emphasis on preservation of remaining agricultural resources in the city, along with natural areas in Prado Regional Park; Designated natural open space areas included in GP land use map
Chino Hills	2014	Chapter 4 Conservation Element; Chapter 6 Parks, Recreation, and Open Space	Chapter 4 Goal CN-1, Goal CN-3; Chapter 6 not updated in 2014 (2008 version not available online)	Clustered development of hills to protect scenic resources and many open space designations; Chino Hills State Park; Many designated open space areas included in GP land use map
Colton	1987 (Open Space and Conservation), 2013 (Land Use)	Chapter 4 Land Use; Chapter 6 Open Space and Conservation	Chapter 4 LU 12.1–12.4, 13.1–13.4; Chapter 6 Principles and Standards	Proposals 1 – 4
Fontana	2003	Chapter 9	Goals and Policies 1.1, 1.2, 2.1, 2.2	Local MSHCP; expand Mary Vagel Park
Grand Terrace	2010	Chapter 4	Goals and Policies 4.1, 4.2, 4.4, 4.5	Proposed Grand Terrace Wilderness Park; Protection of Blue Mountain
Hesperia	2010	Chapter 4 Open Space; Chapter 6 Conservation	Chapter 4 Goals OS-1–OS-6; Chapter 6 Goals CN-1–CN-8	Various efforts to preserve habitat and open lands
Highland	2006	Chapter 5	Policies 5.1, 5.7, 5.11, 5.12	Multi-Use Trail Master Plan

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

**Table 2-4
City, Town, and County General Plan Goals, Policies, and Implementation Measures
for Open Space and Conservation, San Bernardino County.**

Jurisdiction	Year	General Plan Chapter/Element	General Plan Goals and Policies	Implementation Plans/Measures
Loma Linda	2009	Chapter 9	Policies 9.2, 9.4	Hillside Preservation areas; Appropriate setbacks
Montclair	1999	Chapter 4	Policies OS-1.1.1–1.1.12	Focus on implementing construction/improvement of park facilities because of city build-out; Long-term efforts for improvement of park system
Needles	Not Available	Not Available Online	Not Available Online	Not Available Online
Ontario	undated	Policy Plan - Environmental Resources Element	Goal ER5, Policies ER5-1 - ER5-5	New Model Colony (NMC) and right to farm ordinance for agricultural and dairy uses; NMC policies for agricultural and/or open space; potential future opportunities to integrate rare and/or endangered species suitable habitat into new developments and/or participate in regional efforts in conservation of high quality habitat; other conservation through the Prado Basin Habitat Plan (2008) associated with the NMC conservation efforts.
Rancho Cucamonga	2010	Chapter 6	Policies RC-1.1–1.4, RC-8.1–8.7	Open Space Plan; Management of preserves as stated in RC-8.3; Data gathering for possible open space acquisitions; Long-term efforts for protection of open spaces
Redlands	2010	Chapter 7	Policies 7.2a–7.21x	Completion of GP Update Planned for 2017; Open Space Conservation Land Use 'zone'; Long-term efforts for protection of open spaces
Rialto	2010	Chapter 2	Policies 2-24.1, 2-25.1, 2-25.2, 2-28.7, 2-39.1, 2-39.2, 2-39.3	Cooperation with other agencies and preservation of current open space resources
City of San Bernardino	2005	Chapter 12	Policies 12.1.1–12.1.4, 12.2.1–12.2.5, 12.3.1–12.3.5	Cooperation with other agencies and preservation of current open space resources
County of San Bernardino	2007 (amended 2014)	Chapter V. Conservation Element;	Chapter V. - Policies CO 1.1, CO 1.2, CO 2.1 - 2.3, M/CO 1.1 - 1.7,	Preparation of HCPs (West Mojave Plan); Cooperation with other agencies and preservation of extensive open

**San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development**

**Table 2-4
City, Town, and County General Plan Goals, Policies, and Implementation Measures
for Open Space and Conservation, San Bernardino County.**

Jurisdiction	Year	General Plan Chapter/Element	General Plan Goals and Policies	Implementation Plans/Measures
		Chapter VI. Open Space	M/CO 2.1 - 2.9, M/CO 3.1, D/CO 1.1 - 1.13, D/CO 4.1 - 4.3, D/CO 5.1, D/CO 5.2; Chapter VI. - All Policies	space resources; Promote energy development in desert in conjunction with DRECP implementation
Twentynine Palms	2012	Conservation and Open Space Element	Policies CO-1.1–1.11	Various efforts to protect open spaces and sensitive resources
Upland	1982	Chapter 9	Goals and Policies pages 9.12–9.14	Pursuit of funding opportunities for parks system; fiscally constrained policies
Victorville	2008	Resource Element	Policies 4.1.1, 4.1.2, 4.2.1	Participation in the West Mojave Plan; Long-term efforts in conservation planning
Yucaipa	2004	Chapter 12	Policies OS-1C, OS-2G, OS-4B, OS-4C, OS-5A - C, OS-6B, OS-6E, OS-9A, OS-9D, OS-9H	Various efforts to protect open spaces and sensitive resources; GP Update in process
Yucca Valley	2014	Chapter 5	Policies OSC 1-1–1-6, 4-1–4-13, 8-1–8-8	Various efforts to protect open spaces and sensitive resources

**San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development**

Table 2-5

City and Town Hillside Ordinance Development Codes that Provide for Hillside Protections, San Bernardino County.

Jurisdiction	Hillside Ordinance	Year	Ordinance Code Title and Number	Trigger for Ordinance	Map Available	Map Location	General Description
Adelanto	No	–	–	–	–	–	–
Apple Valley	Yes	2010	Development Code 9.71.060 - Hillside Subdivisions	15% slope or greater; building standards differ by slope zones	Yes	General Plan, Conservation and Open Space, Exhibit III-3, pg. III-29	Open Space/Mtn. classification in General Plan; Allowed density of residential building dependent on slope zone and % slope
Barstow	No	–	–	–	–	–	–
Big Bear Lake	Yes	2003	Development Code 17.09 - Slope Density	40% slope or greater (with provision for exceptions); parcel coverage ratio to % of slope calculation	No	–	No building on slopes 40% or greater, unless approved by Planning Commission
Chino	No	–	–	–	–	–	–
Chino Hills	Yes	1999	Development Code Chapter 16.08 - General Design Regulations	15% slope or greater	Yes	Within Development Code 16.08	Exceptionally prominent ridgelines (Code 16.08.040); Required open space set aside acreages based on % slope (Code 16.08.070); Hillside Adaptive Development Standards (16.08.050); Architectural Guidelines for Hillside Development (Code 16.08.060); Open Space Requirements

**San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development**

**Table 2-5
City and Town Hillside Ordinance Development Codes that Provide for Hillside Protections, San Bernardino County.**

Jurisdiction	Hillside Ordinance	Year	Ordinance Code Title and Number	Trigger for Ordinance	Map Available	Map Location	General Description
							(16.08.070)
Colton	Yes	1992	Code of Ordinances, Zoning, Residential Estate Zoning, Chapter 18.10.150 - Hillside Setbacks	Hillside setback; 5 foot setback of a slope of 4:1 with a height of 5 or more feet	No	–	Ord. 0-21-06 and 0-22-06: Moratorium for land use approvals and entitlements in La Loma Hills area
Fontana	Yes	2014	Chapter 30 Zoning and Development Code, Article IX. Overlay Districts, Section 30-301.5 through 30-301.8 - Division 7 Hillside Overlay District	10% slope or greater	No	–	For 25% slope or greater - no buildings or structures shall be allowed except for fencing, low-water-use landscaping and irrigation systems.
Grand Terrace	Yes	2013	Code of Ordinances, Title 18 Zoning, Chapter 18.10 - Residential Districts	Hillside Residential District (RH)	Yes	Planning Department Zoning Map 2007 (RH Zone)	Limits building to one unit per acre; Requires specific site plan on project-by-project basis to establish development standards

**San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development**

Table 2-5

City and Town Hillside Ordinance Development Codes that Provide for Hillside Protections, San Bernardino County.

Jurisdiction	Hillside Ordinance	Year	Ordinance Code Title and Number	Trigger for Ordinance	Map Available	Map Location	General Description
Hesperia	Yes	2014	Code of Ordinances, Title 16 Development Code, Chapter 16.40 - Hillside Development Regulations	20% slope or greater	No	–	Buildable land based on % slope (no building on slopes greater than 40%) (16.40.040)
Highland	Yes	2014	Municipal Code, Title 16 Land Use and Development, Chapter 16.40 General Development Standards, Section 16.40.420 - Hillside Development	Average slope of 10% or greater	No	–	25% slopes or greater are discouraged for grading/building; Percentage of lot to remain in natural state dependent on % slope (section C)
Loma Linda	Yes	2014	Municipal Code, Title 20 Environmental Protection, Chapter 20.12 - Hillside Areas Preservation	Various Hillside zones with different allowable densities	Yes	General Plan Land Use Figure 2.1	Some areas designated strictly conservation; other areas designated low-density development (1 du per 5 or 10 acres)
Montclair	No	–	–	–	–	–	–
Needles	No	–	–	–	–	–	–
Ontario	No	–	–	–	–	–	–

**San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development**

**Table 2-5
City and Town Hillside Ordinance Development Codes that Provide for Hillside Protections, San Bernardino County.**

Jurisdiction	Hillside Ordinance	Year	Ordinance Code Title and Number	Trigger for Ordinance	Map Available	Map Location	General Description
Rancho Cucamonga	Yes	Not Reported	Development Code, Article IV., Chapter 17.52 - Hillside Development	Slope Zoning Limitations - Slope Zones 1–5 based on % slope; Density Limitations based on % slope calculations; general overlay zone divided into slope zones	Yes	Hillside Overlay Map 2007	Transfer of development credits; Buildable land based on % slope (no building on slopes greater than 30%)
Redlands	Yes	2014	City Code, Title 18 Zoning Regulations, Chapter 18.138 - HD Hillside Development District	Any parcel with an average cross slope of 15% slope or greater	No	–	Buildable land based on % slope (18.138.050 - Slope Density Requirements)
Rialto	No	–	–	–	–	–	–
San Bernardino	Yes	2013	Development Code, Title 19 Land Use/Subdivision Regulations, Article II. Land Use Zoning Districts, Chapter 19.17 - Hillside Management Overlay District	Generally, 15% slope or greater; Overlay District (Zone)	Available for purchase	Contact City or submit online request	Density development standards (units per acre) based on % slope; Density Transfer from one slope category to a lower slope category
Twentynine Palms	Yes	2004	Development Code, Regulations and Standards, Chapter 19.64 - Hillside Grading, Clearing, and Plant Removal	30% slope or greater	Yes	Preservation Overlays Map 2012	Hillside grading and clearing requirements rather than actual preservation regulations
Upland	No	–	–	–	–	–	–

**San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development**

**Table 2-5
City and Town Hillside Ordinance Development Codes that Provide for Hillside Protections, San Bernardino County.**

Jurisdiction	Hillside Ordinance	Year	Ordinance Code Title and Number	Trigger for Ordinance	Map Available	Map Location	General Description
Victorville	Yes	2014	Code of Ordinances, Title 16 Development Code, Chapter 3 Zoning and Land Use Regulations, Article 18, Section 16-3.18 - Slope Protection District	Slope of 10 over 1 or greater	No	–	Grading, plant materials, and sprinkler system guidelines for slopes but no conservation areas.
Yucaipa	Yes	2014	Development Code, Division 7 General Design Standards, Chapter 11 - Regulation of Hillside and/or Ridgeline Developments	15.1% slope or greater	No	–	Buildable land based on % slope (Section 87.1135)
Yucca Valley	Yes	2014	Town of Yucca Valley General Plan, Chapter 2. Land Use and Chapter 5. Open Space and Conservation	30% slope or greater; Hillside Residential Zone	Yes	General Plan Land Use Map (Hillside Residential)	Hillside Development Ordinance described in General Plan but not currently described in Town Municipal Code; Measures in General Plan: Chapter 2, low density development (1 du/20 acres); Chapter 5, Policy OSC 8-6

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

3 DATA GAPS

This section identifies and documents gaps in existing data useful in preparing a habitat conservation framework strategy. Data gaps refer to environmental resource information that is lacking. Data gaps may include information that exists but is not readily available and new information that needs to be collected or generated to fill data gaps. An evaluation of *data gaps* differs from a *gap analysis*; a gap analysis evaluates the distribution of biological resources relative to the distribution of protected lands to identify gaps in environmental resource protection (see Section 4.3.2 for a preliminary gap analysis).

Data useful in developing a conservation strategy include natural resources, ownership, and land management information that identifies important ecological/biological communities and functions in the context of existing or future social and economic conditions or limitations. Relevant conservation planning GIS data includes, but is not limited to: vegetation and habitat communities, species occurrences, species habitat models, modeled wildlife corridors and linkage areas, topographic data, hydrological data, soils classifications, conserved lands and open space areas (federal, state, county, and local areas), significant areas for habitat and/or species, ownership boundaries, land uses, development areas, management activities, and management plan boundaries.

Data gaps are existing via several ways. The data may not exist, it may not be accessible, it may not be completed, or its accuracy may not be sufficiently evaluated. Data gaps for this conservation framework study are expected as the scope of the study was not intended to obtain all information, but instead was intended to provide a documentation of data gaps to inform future efforts. The data gaps identified thus far are associated with incomplete information pertaining to the following:

- Biological Resources: incomplete survey data.
- Open Space and Conservation Areas: incomplete information regarding the location/boundaries, acreages, and/or management plans of open space and park areas, conservation/preserve areas, conservation easements for mitigation, and HCP/NCCPs which were established for public use, protection of habitats and species, or as mitigation for impacts to species, habitat, and/or water resources associated with development projects.
- Outreach to Jurisdictions and Agencies: incomplete response from all cities/towns in the County and agencies and/or incomplete or unavailable data for conservation lands, activities, or planned mitigation needs.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

Data gaps were considered when identifying issues, opportunities, and concerns associated with current approaches to habitat conservation and were used to help form recommendations for the next steps needed to implement the Conservation Framework (see Section 7 Next Steps). A brief summary discussion of the primary data gap types are presented below and the existing data gaps are listed in Table 3-1.

Biological Resources

Biological resources databases in the existing data inventory (Table 2-2) contain data gaps which include incomplete habitat and/or species survey information. Additional site-specific and/or sub-regional surveys will be needed to fill in data gaps for development projects, potential new mitigation areas, or conservation planning needs. The survey and/or biological and habitat information collected through this study does not represent complete coverage for all of San Bernardino County therefore new surveys may be needed in the future to collect site-specific information for detailed conservation planning analyses. Alternately, species habitat modeling (e.g., California Wildlife Habitat Relationships models) may be a potential option for some larger-scale conservation planning analyses of species' ranges countywide (see Section 4.2.1 for a discussion of species distribution models). Most biological point location datasets from species occurrence surveys (e.g., CNDDDB, USFWS species occurrences) only report positive detections therefore, the lack of records does not mean the species is absent. Many site-specific evaluations for listed or sensitive species will likely require additional surveys. Similarly, most species occurrence databases do not include current survey information. Although historic species distribution data is valuable for conservation planning, current location information of species would be necessary for most site-specific projects or area evaluations (e.g., evaluation of a potential mitigation site). The quality of metadata associated with databases varies widely from well-populated to a complete lack of information regarding survey methods, timing, location, or other important survey variables. Therefore, unknown or insufficient metadata results in questionable data validity or accuracy. Additionally, many of the biological resources datasets are too course-grained for site-specific project planning analyses.

Open Space and Conservation Areas

GIS databases are incomplete or lacking for some known open space and conservation areas including the location or boundaries and acreages for open space and park areas, conservation/preserve areas, conservation easements for mitigation, and HCP/NCCPs which were established for public use, protection of habitats and species, or as mitigation for impacts to species, habitat, and/or water resources associated with development projects. The data is either not available or is in hard copy format only. Hard copy format data is considered a data gap because this information must be digitized into a GIS format and verified for accuracy prior to

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

use for conservation planning. For example, through this study, it was determined that at least ten cities/towns and four environmental groups are known to be responsible for proposed or existing conservation areas with easements however the locations and boundaries were not available in hard copy and/or GIS format. In addition, management, monitoring, and funding plans associated with most of these conservation areas are not readily available. Though information is available in table format, most of the currently planned and approved HCPs/NCCPs in San Bernardino County are not available in GIS format.

Outreach to Jurisdictions and Agencies

Information requested through outreach efforts to jurisdictions and agencies (see Section 2) resulted in acquiring valuable additional information however response from these entities was not complete or hard copy or GIS format data was not readily available to allow for file sharing. For example, conservation-related information was requested but no response received from a total of 7 of the 24 incorporated cities/towns in the County. Dudek did not receive GIS format land use zoning data reported in General Plans for all of the cities/towns. Also, conservation areas that were set aside as mitigation for development project impacts to species and state (1600 Streambed Alteration Agreement, Section 401 Water Quality Certification) or federal (Section 404 Clean Water Act) waters through permits is not available or in GIS database format.

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

Table 3-1

Existing Data Gaps for the SANBAG Countywide Habitat Preservation/Conservation Framework Study, San Bernardino County

Source Category	Source	Data or Information Type	Description of Data Gap
Federal	Bureau of Land Management	DRECP Grazing Allotment Retirements as Mitigation	Data not available
Federal	US Fish and Wildlife Service (USFWS)	San Bernardino County HCP Boundaries	Complete data of all approved HCP boundaries are available in table format (USFWS 2014) but GIS format is lacking for most HCPs/NCCPs. A total of 20 HCPs/NCCPs have been approved by the USFWS in San Bernardino County. GIS data is currently available for 1 planned HCP (DRECP) and 1 approved HCP (West Mojave Plan). One HCP (Upper Santa Ana River HCP) was digitized into GIS format from a hard copy map by Dudek.
Federal	US Forest Service (USFS)	Mining Projects - Land Acquisition	Quarry Mining Projects: Butterfield and Sentinel Quarries; Mitsubishi Cement Corporation South Quarry Plan of Operation; data not currently available (pending release of Final EISs)
Federal/ City or Town	USFWS/ Colton	West Valley HCP (Delhi Sands Flower-loving Fly)	Hard copy only
Federal/ City or Town	USFWS/ Highland	Santa Ana River HCP ("River Plan")	Hard copy only
Federal/ City or Town	USFS/ Big Bear Lake	Big Bear Lake Landfill Land Swap	Data not available
State	California Department of Parks and Recreation	San Bernardino County State Parks/State Recreation Areas	Hard copy maps available online; follow up contact and information gathering needed to obtain GIS shapefiles for the following areas: Providence Mountains SRA, Silverwood Lake SRA, Wildwood Canyon Park Property
County	Flood Control District	County Flood Control Mitigation Lands	Data not available; mitigation lands are proposed only (not finalized)
County	Local Agency Formation Commission	Mitigation Lands	Excel spreadsheet with information on mitigation lands associated with jurisdiction Specific Plans. Received on May 13, 2014 by Dudek via email from Samuel Martinez, LAFCO.
County	Land Use Services (LUS)	Retired Mineral and Grazing Lands	Data not available
County	LUS	Vacant Land Survey - Heat Map	Some GIS data available; follow up information is needed to clarify 2013 survey data/reporting
County	Public Works	Mitigation Lands	Data not available/provided
County	SANBAG	Future Project Impacts and Mitigation Needs	Data not available/provided

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

Table 3-1

Existing Data Gaps for the SANBAG Countywide Habitat Preservation/Conservation Framework Study, San Bernardino County

Source Category	Source	Data or Information Type	Description of Data Gap
County	SANBAG	Mitigation Lands for SANBAG Projects - current mitigation areas and future mitigation needs	Hard copy table only; No boundaries or locations provided; Hard copy table lists the known mitigation areas in San Bernardino County. The table is organized by SANBAG project and the corresponding type, acreage, and location of mitigation. Included are also future potential mitigation needs. Received from VCS Environmental on July 7, 2014.
County	SCAG	Natural Resources Inventory - GIS Database (version 8/2014)	Electronic spreadsheet only; need to obtain relevant GIS shapefiles
County	Special Districts	Proposed Joshua Tree Preserve	Data not available/provided
County	Transportation	Caltrans Projects - Mitigation Areas	Data not available/provided
City/Town	All Cities/Towns	Land Use Zoning - Open Space	Hard copies available only
City/Town	Apple Valley	Town of Apple Valley HCP/NCCP Boundary	Draft HCP/NCCP therefore data not available until HCP/NCCP is final
City/Town	Apple Valley	Conservation Easements and Mitigation Lands	Mitigation lands planned on BLM lands in association with draft HCP/NCCP but data not available until HCP/NCCP is final
City/Town	Apple Valley	Open Space Areas	Planned in association with draft HCP/NCCP but data not available until HCP/NCCP is final
City/Town	Big Bear Lake	Habitat Conservation - Possible Sites	Digitized from hard copy; QA/QC verification needed
City/Town	Big Bear Lake	Shay Pond - Unarmored Threespine stickleback (<i>Gasterosteus aculeatus williamsoni</i>) habitat	Occupied habitat for federally endangered fish species presents a conservation opportunity (currently not protected)
City/Town	Chino	Conservation Easements and Mitigation Lands - New Model Colony project	Data not available/provided
City/Town	Chino	Open Space Areas	Data not available/provided
City/Town	Chino Hills	Conservation Easements and Mitigation Lands	Data not available/provided for City-owned and HOA-owned mitigation lands; Chino Hills State Park
City/Town	Chino Hills	Open Space/Parks	Data not provided; Chino Hills State Park; 3,000 acres of City-owned open space; 2,000 acres HOA-owned open space

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

Table 3-1

Existing Data Gaps for the SANBAG Countywide Habitat Preservation/Conservation Framework Study, San Bernardino County

Source Category	Source	Data or Information Type	Description of Data Gap
City/Town	Chino Hills	Mitigation Bank - Proposed Land Veritas Mitigation Bank	Data not provided
City/Town	Colton	Conservation Easements and Mitigation Lands	Data not available/provided
City/Town	Colton	Open Space Areas	Data not available/provided
City/Town	Colton	Planned Large Developments	Data not available
City/Town	Fontana	Conservation Areas	Digitized from hard copy; QA/QC verification needed
City/Town	Fontana	Delhi Sands Flower-loving Fly Preserve/Jurupa Hills and Mary Vagel Conservation Area	Hard copy only
City/Town	Grand Terrace	All conservation information	No Response or Input from City/Town
City/Town	Hesperia	Conservation Easements and Mitigation Lands	Data not available/provided; 11 acres of 404 permit mitigation lands associated with development
City/Town	Hesperia	Open Space/Parks, Mitigation Banks, Planned Large Developments	Data not provided
City/Town	Highland	Conservation Easements and Mitigation Lands	Data not available/provided
City/Town	Highland	Open Space Areas	Data not available/provided
City/Town	Loma Linda	All conservation information	No Response or Input from City/Town
City/Town	Montclair	All conservation information	No Response or Input from City/Town
City/Town	Needles	All conservation information	No Response or Input from City/Town
City/Town	Ontario	Conservation Easements and Mitigation Lands - New Model Colony project	Hard copy only
City/Town	Rancho Cucamonga	Conservation Easements and Mitigation Lands	Data not provided; north part of City will have mitigation lands set-asides due to fault zone and steep terrain area
City/Town	Rancho Cucamonga	Open Space/Parks - Cucamonga Canyon	Data not provided for Cucamonga Canyon
City/Town	Rancho Cucamonga	Planned Large Developments - Corey Ranch project	Data not provided
City/Town	Redlands	Santa Ana River HCP ("River Plan")	Data not available/provided

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

Table 3-1

Existing Data Gaps for the SANBAG Countywide Habitat Preservation/Conservation Framework Study, San Bernardino County

Source Category	Source	Data or Information Type	Description of Data Gap
City/Town	Redlands	San Timoteo Canyon and Hillside Conservation Areas	Data not available/provided
City/Town	Redlands	Open Space Areas - San Timoteo Canyon and Greenbelt Areas Managed by Redlands Conservancy	Data not available/provided
City/Town	Rialto	All conservation information	No Response or Input from City/Town
City/Town	San Bernardino	All conservation information	No Response or Input from City/Town
City/Town	Twentynine Palms	All conservation information	No Response or Input from City/Town
City/Town	Upland	All conservation information	No Response or Input from City/Town
City/Town	Victorville	Land Use Gateway Specific Plan - Open Space	Hard copy only
City/Town	Victorville	Conservation Easements and Mitigation Lands	Data not available/provided; individual projects have mitigation lands but data is not available
City/Town	Yucaipa	Conservation Easements and Mitigation Lands	Data not available/provided; 80 acres associated with home site (zoned as Rural Living area)
City/Town	Yucaipa	Open Space/Parks	Data not available/provided for Open Space/Parks: Wildwood State Park; Wildwood Canyon City Park; Crafton Hills; data in GIS format is held by University of Redlands
City/Town	Yucaipa	Planned Large Developments	Data not available/provided; 60% open space associated with McDougal Brothers project
City/Town	Yucca Valley	Wildlife Corridors	Hard copy only; need to confirm if other GIS shapefiles depicting wildlife corridors are consistent with Yucca Valley adopted corridors
Resource Conservation District	Mojave Desert Resource Conservation District	Mojave River Habitat Restoration Areas - Invasive Species Removal Projects	Data not readily available/provided
Environmental Group	Center for Biological Diversity	Conservation Easements and Mitigation Lands	Data not readily available/provided
Environmental Group	Mojave Desert Land Trust	Mojave Desert - Inholdings Acquisitions for National Parks, National Preserve; Wildlife Linkage Areas	Hard copy maps available online

**San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development**

Table 3-1

Existing Data Gaps for the SANBAG Countywide Habitat Preservation/Conservation Framework Study, San Bernardino County

Source Category	Source	Data or Information Type	Description of Data Gap
Environmental Group	National Parks Conservation Association	Conservation Easements and Mitigation Lands	Data not readily available/provided
Environmental Group	San Bernardino Mountains Land Trust	San Bernardino National Forest - Inholdings Acquisitions for Forest Open Space and Wildlife Habitat	Hard copy maps available online
Environmental Group	Transition Habitat Conservancy	West Mojave Desert - Transition Zone Habitats, Wildlife Corridor Habitats	Hard copy maps available online; information gathering needed for areas such as: Puma Canyon Ecological Reserve - Pinon Hills, Portal Ridge Wildlife Area- South-West Antelope Valley, Desert Wildlife Management Area - Kramer Junction
Environmental Group	The Nature Conservancy	Nature Preserves	Data not readily available; data layers needed for Preserves in San Bernardino County including: Big Morongo Canyon Preserve, Amargosa River Project (Conservation Lands)
Environmental Group	The Wildlands Conservancy	Conservation Projects, Land Acquisitions, Preserves and Reserves, Proposed National Monuments	Hard copy maps available online; follow up contact and information gathering needed to obtain GIS shapefiles for the following areas: Proposed Mojave Trails National Monument, Proposed Sand to Snow National Monument, California Desert Land Acquisition projects, Pioneertown Mountains Preserve, Whitewater Canyon Preserve, Mission Creek Preserve, Bluff Lake Reserve, Bearpaw Reserve, Oak Glen Preserve
Environmental Group	Various Mojave Desert Community Organizations	Conservation Efforts	Follow up contact and information gathering needed; Groups such as Mojave Conservation Community Collaborative (MC3), The Alliance for Desert Preservation, The Lucerne Valley Economic Development Association
Private	Vulcan Materials Company	Mining and Mineral Rights	Rights to mining for lands owned by Vulcan Materials Company. Information gap conveyed to Dudek on December 11, 2014 during Environment Element Group meeting by representatives from Vulcan Materials Company.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

4 CONSERVATION ANALYSIS

This section provides the conservation analysis for Countywide Habitat Preservation/Conservation Framework. This conservation analysis is intended to:

1. Frame the regulatory and planning context related to biological and open space conservation in order to facilitate the development of the principles and recommendations provided in Section 6 (Section 4.1)
2. Provide a landscape-scale summary of the biological resources in the County in order to provide context and focus the development of the principles and recommendations provided in Section 6 (Section 4.2).
3. Discuss considerations relevant to development of the Conservation Framework (Section 4.3).

4.1 Regulatory and Planning Context

The following is a description of the laws, regulations, policies, and planning pertinent to the preparation of the Conservation Framework.

4.1.1 Federal Regulatory and Planning Context

Federal Endangered Species Act

The Federal Endangered Species Act of 1973 (ESA), as amended, is administered by the US Fish and Wildlife Service (USFWS), for terrestrial plant and animal species, and the National Oceanic and Atmospheric Administration (NOAA) and National Marine Fisheries Service (NMFS) for marine and anadromous species. The ESA is intended to be a means to conserve endangered and threatened species, while also preserving the ecosystems that they rely on. The act defines an endangered species as “any species that is in danger of extinction throughout all or a significant portion of its range.” Under the ESA, it is considered unlawful to take any listed species, and “take” is defined as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.”

The ESA allows for incidental take of listed species under Section 7 and Section 10 exemptions. Under Section 7, federal agencies that authorize, fund, or carry out actions that may result in take of listed species or destruction or adverse modifications of designated or proposed critical habitat must consult with the USFWS and/or NMFS. Section 10 exemptions apply to actions that do not require federal agency action other than the issuance of the incidental take permit, and these incidental take permits can be issued for listed species subsequent to the approval of a Habitat

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

Conservation Plan (HCP). An HCP must specify the level of impact that will result from the taking, the steps that will be taken to minimize and mitigate the impacts, the funding necessary to implement the HCP, a discussion of alternatives, and any other necessary measures required by the Secretary of the Interior.

There have been 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).

Several HCPs have been or are being planned in San Bernardino County.

- San Bernardino Valley-wide Multiple Species Habitat Conservation Plan (MSHCP): Planning was initiated for this multiple species plan in the valley portion of the County, but this effort is not currently being pursued in this form.
- West Mojave Plan: The West Mojave Plan, which covers the western portion of San Bernardino County in the desert region, was originally envisioned as a multiple species HCP and a Land Use Plan Amendment for BLM-administered lands. The HCP component of the plan was not approved as part of this planning effort, but the West Mojave Plan does serve as a land use plan amendment under the California Desert Conservation Area Plan (see below under Federal Land Policy and Management Act).
- North Fontana MSHCP: A planning effort initiated in 2004 concentrating on the northern portion of the City of Fontana, adjacent to the foothills of the San Gabriel Mountains. The plan anticipates build out of development into the remaining natural areas in north Fontana, and addresses the listed and sensitive species found in these areas.
- Town of Apple Valley MSHCP: An ongoing planning effort to develop a multiple species HCP being developed for the Town of Apple Valley and the Town's sphere of influence (SOI) area. The County has expressed support of this planning effort.
- Desert Renewable Energy Conservation Plan (DRECP): In October 2014, the public draft DRECP was released, which is a multiple species General Conservation Plan (i.e., a programmatic HCP), a Natural Community Conservation Plan (NCCP), and a BLM Land Use Plan Amendment. This multi-agency plan spans all or portions of seven counties in the desert regions of California, including the all of the desert portion of San Bernardino County. The DRECP would provide take authorization only for renewable energy and transmission related development, but the plan could serve as a framework for permit streamlining and a conservation strategy for the desert region of the County.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

The Natural Community Conservation Planning Act in Section 4.1.2 includes a discussion of NCCPs in the planning area.

Federal Land Policy and Management Act

The Federal Land Policy and Management Act of 1976, as amended, establishes public lands policy and management guidelines on public lands managed by the BLM. The Act includes land use planning, range management, rights-of-way, and designated management areas.

The California Desert Conservation Area Plan was approved in 1980 in accordance with the Federal Land Policy and Management Act. The CDCA Plan provides for multiple use management of approximately 25 million acres, of which 10 million acres are managed by the BLM, falling within San Bernardino County along with six other counties. The CDCA Plan has been amended numerous times, and is based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The CDCA Plan aims to protect biological, geological, paleontological, scenic, and cultural resources while allowing for a variety of land uses and activities.

Several major amendments to the CDCA Plan have been made in San Bernardino County, including the BLM Northern and Eastern Colorado Desert Coordinated Management Plan (NECO), BLM Northern and Eastern Mojave Desert Management Plan (NEMO), and the BLM West Mojave Plan (WEMO). The proposed DRECP (see description above under ESA) would also serve as a major Land Use Plan Amendment in the CDCA area.

Omnibus Public Land Management Act of 2009

The Department of the Interior and BLM established the National Landscape Conservation System (NLCS) in 2000, to provide coordinated protection for the BLM's conservation lands. The Omnibus Public Land Management Act of 2009 then congressionally established the NLCS, to "conserve, protect and restore nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of future generations." Inclusion in the NLCS does not provide any new legal protections for the lands already designated as national monuments, conservation areas, wilderness study areas, scenic trails, or historic trails designated as a component of the National Trails System, components of the National Wild and Scenic Rivers System or components of the National Wilderness Preservation System; however, it provides a single system to manage and organize conservation lands on a national scale.

US Forest Service

The San Bernardino National Forest lies in southwest San Bernardino County, dividing the deserts from the valley communities. The US Forest Service has jurisdiction over these lands and

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

manages them conservatively to ensure their long-term sustainability. The land management strategy employed by the Forest Service follows their “multiple use” doctrine, and includes suitable commodity and commercial uses (USDA 2005a). Uses and actions proposed on National Forest lands ultimately occur at the discretion of the US Forest Service. The Land and Resource Management Plan for the San Bernardino National Forest emphasizes sustainable use through the delineation of “land use zones” that identify allowable activities by zone, demonstrating the intent of multiple use management (USDA 2005b). The US Forest Service manages Angeles National Forest, which edges into San Bernardino County, in a similar fashion.

Other Federal Laws, Regulations, and Policies Relevant to Resource Protection and Conservation Planning

Numerous other federal laws, regulations, and policies are relevant to resource protection and conservation planning in the planning area, including but not limited to the following:

- Migratory Bird Treaty Act (USFWS)
- Bald and Golden Eagle Act (USFWS)
- National Environmental Policy Act (Environmental Protection Agency [EPA])
- Wilderness Act
- Clean Water Act (EPA)
- Wild and Scenic Rivers Act
- BLM special-status species policy
- Executive Order 13112 on invasive species

4.1.2 State Regulatory and Planning Context

California Endangered Species Act

The California Endangered Species Act, administered by the California Department of Fish and Wildlife (CDFW), prohibits the take of plant and animal species designated by the California Fish and Game Commission as endangered, threatened, or candidates for listing as endangered or threatened in the State of California. State statutes enforced by the CDFW for the implementation of the California ESA are set forth in the California Fish and Game Code and Title 14 of the California Code of Regulations. The California Fish and Game Code (CFGC) defines “take” as, to “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill” (California Fish and Game Code, Section 86). The CFGC prohibits the take of any state listed species without an incidental take permit from the CDFW or the authorization

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

from the director providing that the incidental take permit provided by the USFWS under the Federal ESA is consistent with the California ESA. CFGC Section 2053 provides that it is impermissible for state agencies to approve projects that will “jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat which would prevent jeopardy.”

The California ESA authorizes incidental take of endangered, threatened, or candidate species given that take is incidental to otherwise lawful activity and other specific criteria are met. Take of fully protected species can be authorized if the species is conserved as a covered species under and approved NCCP.

Natural Community Conservation Planning Act

The Natural Community Conservation Planning Act (1991) provided the statutory framework for the creation of NCCPs, which provide long-term, landscape scale protection for natural vegetation communities and wildlife diversity, while allowing for continued permissible use and expansion of compatible land uses. The NCCP program supports collaborative planning and approval by involving local governments, state and federal agencies, environmental organizations, landowners, and members of the public. The NCCP framework is meant to support the provision of regional and subregional protection for species that inhabit designated natural communities. The program attempts to avoid the gridlock sometimes caused by the listing of species by planning regional conservation measures that focus on the long-term stability of wildlife and plant communities, while including key stakeholders in the process. Through an approved NCCP, incidental take authorization would be allowed for covered species whose conservation and management is provided for under the plan. The Town of Apple Valley MSHCP and the DRECP, as described above under the federal Endangered Species Act, are the only NCCPs currently being planned in San Bernardino County.

Other State Laws, Regulations, and Policies Relevant to Resource Protection and Conservation Planning

Numerous other state laws, regulations, and policies are relevant to resource protection and conservation planning in the planning area, including but not limited to the following:

- California Environmental Quality Act
- California Fish and Game Code: Lake and Streambed Alteration Agreement
- California Fish and Game Code: 3511, 3503, 3513

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

4.1.3 Regional and Local Regulatory and Planning Context

San Bernardino County General Plan

The County of San Bernardino General Plan Conservation Element (County of San Bernardino 2007) identifies the desert, mountain, and valley as regions of biological habitat throughout the County. Vegetation communities within the valley region predominantly consists of chaparral, coastal sage scrub, deciduous woodlands, grasslands, and wetlands vegetation types in undeveloped areas. In addition, there are other vegetation communities in the valley region of the County that are also of biological importance including alkali wet meadows, pebble plains, limestone substrate, walnut woodland, Joshua tree woodland, perennial springs, and riparian woodlands. The Santa Ana River watershed is a key wetland and riparian habitat area with important biological resources within the Day Creek, Etiwanda Creek, Sevaine Creek, Lytle Creek, Cajon Wash, San Timoteo Wash, and Mill Creek. In the mountain region of the County, 14 Areas of Special Biological Importance (ASBIs) have been identified with some of the best habitat located within the San Gorgonio Mountain area. The desert region also has 11 designated Areas of Critical Environmental Concern (ACECs), designated Critical Habitat, Desert Wildlife Management Areas (DWMS), the Joshua Tree National Park, and the Mojave National Preserve. The Nature Conservancy also recognizes areas for protection and has designated the Morongo Valley area as the Big Morongo Canyon Preserve.

The County's Conservation Element contains numerous policies for the preservation and conservation of important biological resources. These involve coordinating with local, state, and federal agencies to create and maintain GIS systems for important biological resources including biological and open space overlays, identifying appropriate biological resource buffering techniques and the creation of mitigation banks and conservation easements, and requiring development to survey and mitigate for biological resources. Specifically, in the mountain region the County encourages creating and utilizing biological zoning overlays to protect natural features and biological resources, developing guidelines for protecting eagle perch trees and spotted owl nest trees, and encouraging development clustering to avoid impacts to biological resources. The County's Conservation Element also contains policies intended to maintain the long-term health of forest environments as well as the preservation and translocation of existing vegetation especially Joshua trees and Mojave yuccas. The County also encourages the preparation of and participation in regional HCPs including those for desert tortoise and Mojave ground squirrel that could involve the use of developer fees, land ownership transfers, and conservation easements. The Conservation Element also promotes energy development in the desert in concert with implementation of the DRECP. San Bernardino County General Plan Land Use Designations are shown in Table 4-1 and on Figure 4-1.

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

**Table 4-1
San Bernardino County General Plan Land Use Designations**

Land Use Designation	Desert Region	Mountain Region	Valley Region	Total
Agriculture	51,883	5,684	14,695	72,262
Commercial and Services	39,230	835	21,398	61,463
General Office	1,155	67	528	1,750
Heavy Industrial	5,708	88	11,672	17,468
Light Industrial	22,145	15	11,069	33,230
Military	3,111	236	6,548	9,895
Mixed Commercial and Industrial	9,207	88	6,166	15,461
Mixed Urban	30,566	5,687	17,932	54,184
Open Space and Recreation	10,862,640	499,501	38,846	11,400,987
Other Residential	740,479	19,763	17,265	777,508
Single Family Residential	139,661	20,483	102,245	262,389
Special Use Facilities	10,259	697	6,308	17,263
Transportation, Communication, and Utilities	7,324	672	14,292	22,289
Unknown	10,705	22	3,076	13,803
Vacant	--	--	1,991	1,991
Water	--	--	210	210
Total	11,934,073	553,838	274,241	12,762,152

Source: Southern California Association of Governments (SCAG 2008) summary data for San Bernardino County General Plan land use designations
Notes: The general plan land use dataset covers the entire county; however, in many road right-of-way areas, there is no land use designation. Therefore, the total acreage of the County planning area reported here is less than the actual acreage of the planning area reported in other tables in this section. Military bases in the planning area are largely categorized as Open Space and Recreation in this dataset. See Table 4-2 for a summary of land ownership within the planning area to get a more accurate representation of military facilities in the planning area.

SCAG/SANBAG Regional Comprehensive Plan

The SCAG (Southern California Association of Governments) Regional Comprehensive Plan provides regional problem solving advisory for issues associated with traffic, air quality, open space and habitat, housing, and water, among other things. SCAG incorporates 188 local governments from Imperial, Orange, Los Angeles, Riverside, San Bernardino, and Ventura counties into a regional planning dialogue. This collaborative effort also incorporates key stakeholders into the integrated planning process. The Plan advises large scale sustainability and encourages balancing resource conservation with economic stability and social welfare. By laying out a decision making framework, the tenets of the Plan are intended to be considered when local governments update their General Plans or make adjustments to municipal codes and incentive programs, giving them a broader perspective of the effects of their actions.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

Local Jurisdictions Policies and Ordinances

The following provides a summary of the policies and ordinances of local jurisdictions that are relevant to developing a habitat preservation/conservation framework. See also Section 2 of this report for the specific policies and ordinances related to open space for each jurisdiction.

City of Adelanto

The City of Adelanto's General Plan Conservation/Open Space Element (City of Adelanto 2000) identifies a Conservation/Open Space Plan to integrate both natural and man-made systems within the General Plan. Open space policies focus on maintaining natural and existing drainage channels as a means of linking parks and recreational facilities through a network of trails. These drainage channels will be required to be natural (non-concrete) to the extent feasible. Long-term goals and strategies include developing a comprehensive plan for parks, recreation, and open spaces. Resources identified within the Conservation/Open Space Element include the Mojave River Corridor and Fremont Wash. Areas identified for conservation are designated as Open Space on the Land Use Map.

Town of Apple Valley

Apple Valley has four categories of open space land use designations: (1) preservation of natural resources, (2) resource management, (3) recreation, (4) public health and safety (Town of Apple Valley 2009). The first category is of importance for conservation analysis as it is utilized for protection of scenic resources, plant and wildlife resources (including critical habitat), ecological reserves for scientific study, hillside lands (and slopes greater than 15%, see Section 9.71.060 of Development Code), riparian areas, and trails. The General Plan Exhibit III-3 includes hillside ordinance areas. Conservation of these resources will be implemented through the Town of Apple Valley Multiple Species Habitat Conservation Plan (Apple Valley MSHCP). Significant lands and resources are to be identified in the Apple Valley MSHCP and monitored and maintained on an ongoing basis. In order to provide for protection, conservation easements would be obtained through the necessary agencies.

INTENTIONALLY LEFT BLANK

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

City of Barstow

Many of the recreational and open space resources are not under direct control of the City of Barstow (City of Barstow 1997). Parks and recreational facilities are controlled by the Barstow Park and Recreation District and open lands used for recreation are under the control of the Bureau of Land Management. The Barstow Park and Recreation District maintains a 510 square mile region which includes the City of Barstow and surrounding unincorporated areas. Methods of implementing conservation goals are identified in the Recreation and Open Space Element policies. Barstow aims to ensure that large utility easements remain as large areas of open space. Like other jurisdictions, Barstow identifies the importance of a Mojave River Corridor Special Treatment Area for preservation. Plan implementation would involve a multi-jurisdictional effort to develop a multiple use recreation plan for existing and future parks and recreation lands.

City of Big Bear Lake

Big Bear Lake does not designate areas as open space on land use or zoning maps (City of Big Bear Lake 1999). However, some areas have been set aside for conservation and preservation. Over 1,300 acres near Baldwin Lake have been set aside with portions owned by the State and Natural Heritage Foundation (NHF). NHF also owns other conservation sites including Stanfield Marsh, Moonridge pebble plains, and Rathbun Creek. Much of NHF-owned land is for the protection of sensitive species and habitat while still providing for recreational opportunities. Long-term plans include working with the Municipal Water District in developing the Stanfield Marsh Waterfowl/Wildlife Improvement Project, supporting NHF in conservation and preservation efforts within and around Big Bear Lake, and potentially seeking to acquire land for the means of maintaining open space. Such land acquisition should occur if the property is located within a scenic viewshed, contains sensitive or protected habitat or species, and provides access or linkages to significant open space or habitat. The City also has development standards for “slope density” in Section 17.09 of its Development Code which is based upon a ratio between slope and lot coverage. No development may occur on slopes 40% or greater.

City of Chino

The City of Chino aims to maintain long-term preservation of open space and conservation of agricultural lands (City of Chino 2010). The City has six categories of open space: (1) preservation of natural resources, (2) managed production of resources, (3) outdoor recreation, (4) public health and safety, (5) support of the mission of military installations, and (6) protection of Native American place, features, and objects. The City identifies that the southern portion of the City supports greater biodiversity due to larger areas of unimproved lands including the San Ana River drainage basin, Prado Regional Park, Prado Lake, Subarea 1, and

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

The Preserve. There are a total of 40 special-status plant species and 57 special-status animal species observed in the City. Conservation planning could be achieved through restoration efforts on undeveloped areas of the southern portions of the City and the creation of conservation and preservation easements throughout the City. Easements would be chosen based upon their relation to important biological resources, corridors, and general habitat value. Programs would be intended to be a simple process and provide some form of benefit to land owners.

City of Chino Hills

The City of Chino Hills is currently in the process of updating its General Plan (City of Chino Hills 2014). The update will address various land use delineations. The City has an estimated 3,420 acres of public open space, 1,152 acres of private open space, 283 acres of public park, 7,170 acres of agricultural land, and 7,366 acres that comprise the Chino Hills State Park. Land use policy changes include clustering of development, specifically in the agricultural and rural context, to protect environmental resources. Section 16.08 of the City's Municipal Code sets forth requirements for development standards regarding ridgeline and hillside (slopes 15% or greater) development. In summary, these ordinances provide that prominent and identified ridgelines and knolls shall not be developed, strict development standards, and architectural standards. Within the municipal code are numerous figures depicting hillside areas, development standards, and architectural examples. Conservation planning efforts could be focused on land within and surrounding Chino Hills State Park and public open space. There may be potential for land acquisition of private open space or development of a program to incentivize land owners to conserve private open space.

City of Colton

The City of Colton has four factors that affect their use of an open space land use designation: (1) urban areas, (2) environmental factors, (3) conservation factors, and (4) public ownership and permanent open space (City of Colton 1987). The City falls short by approximately 87 acres when compared to providing a minimum 5 acres per 1,000 persons. Long-term forecasts indicate that there will be a need for an additional 237 to 262 acres of improved parks. The City identifies that permanent open space can be sought through public ownership; for instance, the Riverwash area is mostly owned by the San Bernardino County Flood Control District and will remain a permanent open space area. Conservation policies call for strict hillside development standards, a wide range of active and passive recreational land uses, and conservation of open space to protect natural resources including water supply. Planning efforts can be focused on establishment of conservation easements on lands that contain significant natural resources such as scenic vistas, cultural resources, hillsides, and sensitive biological resources. Such efforts, if jointly used for passive or active recreation may also help the City's parkland provision deficit.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

Section 18.10.150 of the City's Municipal Code identifies a five foot hillside setback requirement for all 4:1 slopes greater than five feet in height.

City of Fontana

The City of Fontana is evolving from an agricultural and industrial base to a bedroom community and seeks to maintain natural and open space as the City becomes increasingly urbanized through implementation of its conservation policies (City of Fontana 2003). Open space is divided into three categories: (1) open space, including publicly owned land on steep slopes of the foothills; (2) recreation facilities, including local and regional parks; and (3) public utility corridors. The City initiated the planning of an MSHCP for the northern portions of its jurisdiction (see above under federal Endangered Species Act). Conservation planning opportunities exist within Jurupa Hills and the foothills north of Interstate 15 (which function as a wildlife corridor). Eight plant communities exist within the City: (1) northern mixed chaparral, (2) Riversidean Sage Scrub, (3) Riversidean alluvial fan sage scrub, (4) California Walnut Woodland, (5) Southern Cottonwood-Willow Riparian Forest, (6) Southern Sycamore-Alder Riparian Woodland, (7) non-native annual grasslands, and (8) ornamental woodlands. The Open Space and Conservation Element also provides an extensive list of occurring and potentially occurring species, which are found in the highest concentrations in and around alluvial fans and streamside woodlands. Conservation efforts should focus on open space within the San Gabriel Mountains and Jurupa Hills by applying the Open Space designation and obtaining full or partial City ownership to maintain the land. The City zoning code has a Hillside Overlay District that is initially triggered on slopes 10% or greater; the City has separate requirements and development standards at every 5% slope interval up to a 25% slope.

City of Grand Terrace

The City of Grand Terrace has a total of 100.2 acres of existing improved parks and joint-use recreational school sites (City of Grand Terrace 2010). Open space also includes undeveloped hillsides of Blue Mountain, public utility corridors, and the Santa Ana River Floodplain. The City identifies the importance of the western steep slopes of Blue Mountain as a biological resource which accounts for the majority of the 600 acres of undeveloped land within its jurisdiction. The City owns only 25 acres of the Blue Mountain hillside as an undeveloped park. Conservation opportunities exist across the hillside of Blue Mountain as identified in the Open Space and Conservation Element; the City has policies regarding the potential of developing the Grand Terrace Wilderness Park on the hillside of Blue Mountain as an active recreation area for biking, hiking, and picnicking. Beyond Blue Mountain, conservation planning opportunities exist within utility easements and the Gage Canal. The Residential Hillside District zone within the City is intended to limit development along hillsides to one dwelling unit per acre.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

City of Hesperia

The City of Hesperia currently has 2,126 acres of designated open space that include washes, bluffs, the Mojave River, parks, equestrian facilities, and trails (City of Hesperia 2014). The City has identified that the range and habitat for the Desert Tortoise, Mohave Ground Squirrel, and Arroyo Toad exist within its jurisdiction. Acknowledging this, the City has implemented goals and policies aimed at preserving and conserving open space permanently for the benefit of sensitive species. Conservation planning could focus on the various washes that exist throughout the City which encompass approximately 1,512 acres. City policies call for the implementation of the Transfer of Development Rights Program to aid in annexation of open space land to City ownership in order to permanently preserve the land. Section 16.40 of the City's Municipal Code sets forth provisions for Hillside Development Regulations; as defined by the City, hillsides are areas which have a 20% slope or greater. Development density is determined by slope, with no development allowable on 40% slopes or greater.

City of Highland

The City of Highland is bordered by the San Bernardino Mountains and San Bernardino National Forest and places emphasis on preserving scenic views by enforcing hillside development standards (City of Highland 2006). The City limits are part of two existing conservation planning areas and proposed planning areas including the Upper Santa Ana River Wash Land Management and Habitat Conservation Plan and the San Bernardino Valley-wide Multi-Species HCP. Additional conservation planning efforts should work with the existing HCPs within the City. In order to coordinate with these plans, the City has various policies aimed at maintaining and protecting significant biological resources which includes tree preservation ordinances, protecting wildlife corridors, and preserving native and sensitive vegetation. Further conservation efforts could include greater implementation of the Multi-Use Trail Master Plan as a means to provide regional linkages between open spaces and a method for dedication of land from private development. Section 16.40.420 of the City's municipal code provides hillside development regulations for all areas with a 10% slope or greater. Development on slopes 25% or greater is generally discouraged.

City of Loma Linda

The southern one-third of the City of Loma Linda, known as the South Hills, comprises the majority of the natural open space within the City (City of Loma Linda 2009). Agricultural lands and parks also fall under the City's category of open space. The City has a strict Hillside Conservation Ordinance in which development is subject to specific performance standards to ensure the hillside is preserved. Conservation planning could occur through the implementation

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

of the Riding and Hiking Trails Plan that can link open space with a network of trails and paths. Within the City's sphere of influence, approximately 1,910 acres of land has been designated as critical habitat for the California gnatcatcher. The San Timoteo Wash provides critical habitat for the San Bernardino Kangaroo Rat. Conservation efforts could work through the General Plan policies that focus on preserving critical habitats, wildlife movement corridors, and hillside conservation. Section 20.12 of the City's municipal code defines Hillside Areas Preservation within the City. General Plan Land Use Figure 2.1 shows the various hillside zones that allow different densities and have different development standards.

City of Montclair

The City of Montclair currently has 48.7 acres of park, 105 acres of flood control facilities, and 177 acres of agricultural lands (City of Montclair 1999). Conservation efforts within the City could work through improving existing and constructing future park facilities. Expansion of open space areas could be achieved through implementation of park fees to acquire lands and utilization of water retention basins, vacant parcels, and utility right-of-ways for open space. Coordination with the Chino Basin Water Conservation District, the San Bernardino County Flood Control District, and other agencies is a key for open space conservation efforts. For example, one of the flood control areas previously served as a "Wilderness Park."

City of Needles

No general plan information related to open space or conservation planning is available for the City of Needles.

City of Ontario

The City of Ontario General Plan Environmental Resources Element (City of Ontario 2010) describes the built-out nature of the City and its prevalent agricultural uses. The Delhi Sands flower-loving fly and the San Bernardino kangaroo rat are special status species that are known to occur within the City. The burrowing owl also exists in the natural and agricultural habitat of the City. Policy ER5-1 in the General Plan specifically states that the City supports the protection of biological resources through the establishment, restoration, and conservation of high quality habitat areas. As part of the New Model Colony development which was annexed into the City in 1999, the City established a mitigation fee that will collect funds to use in the Greater Prado Basin Habitat Conservation Program area (Riverside Land Conservancy 2008). The Greater Prado Basin area also includes the Cities of Chino, Chino Hills and Norco. The fees collected will go towards conservation efforts (land acquisition, restoration/enhancement, maintenance and

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

management) in the Greater Prado Basin area and primarily support habitat for burrowing owls, raptors, waterfowl and Delhi Sands flower-loving fly.

City of Rancho Cucamonga

The City of Rancho Cucamonga has approximately 8,224 acres of open space that includes parks, undeveloped lands, conservation areas, and utility easements. Figure RC-1 of the General Plan identifies all open space, including hillside residential (City of Rancho Cucamonga 2014). A Hillside Management Overlay District applies to areas where land has a 15% of greater slope and a Conditional Use Permit is required for all uses in the overlay district. The Open Space Plan contains various policies directed towards preservation and conservation of the City's open space resources. There are several sensitive habitat areas including: alluvial fans (such as the Etiwanda Fan), alluvial fan sage scrub, and riparian and wetland areas. Conservation areas include the North Etiwanda Preserve (760 acres), Day Creek Preserve (200 acres), San Sevaine Preserve (137 acres), U.S. Forest Service Conservation Area (880 acres), and a 35 acre conservation area. Conservation efforts could work through coordination with other agencies that own areas of open space (such as County of San Bernardino, County Flood Control District, State Department of Fish and Wildlife, and U.S. Fish and Wildlife Service) to effectively manage and expand existing preservation and conservation areas.

City of Redlands

The City of Redlands has an approximate total of 738.1 existing and proposed park and open space land (City of Redlands 1995). The City has an Open Space Committee of the Redlands Parks Commission which was designated to recommend land for the acquisition of open space. Section 18.138 of the municipal code outlines regulations for hillside development; these regulations are triggered on land with a slope of 15% or greater, with the buildable land based on the percent of slope. Eight special status vegetation communities exist within the City. Conservation planning could focus on identified wildlife corridors within the General Plan (see Figure 7-2) which include the San Bernardino National Forest, Santa Ana River Wash, Crafton Hills, San Timoteo/Live Oak Canyons, and the Badlands. Preparation of a Master Biotic Management Plan is a potential tool that could be used for conservation efforts in the City.

The City of Rialto

The City of Rialto has potential for open space conservation within Lytle Creek Wash (City of Rialto 2010). Conservation planning efforts could focus on acquisition of land or coordination with land owners of floodplain areas, utility easements, and other areas of undeveloped or very low density lands. Opportunities exist in reclamation of the Mid-County Landfill for use of

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

appropriate open space and recreational uses. Policy 2-39.1 calls for coordination with wildlife agencies to establish a Habitat Conservation Plan within the City. Generally, conservation efforts within the City of Rialto would require multi-agency coordination to ensure protection of sensitive species and habitats. The City's primary sources of water are local groundwater and surface water, therefore protection and conservation of Lytle Creek is important for long-term planning efforts.

City of San Bernardino

The City of San Bernardino General Plan Natural Resources and Conservation chapter (City of San Bernardino 2005) identifies some of the important habitat within the City as the aquatic and woodland communities of the San Bernardino Mountains and the Santa Ana River and its tributaries. Additionally, the alluvial fans and floodplains of the valley floor support distinctive scrub vegetation containing an assortment of shrubs characteristic of both coastal sagebrush and chaparral communities. However, much of the valley and upland areas have undergone extensive disturbance by agricultural and urban land uses. The City has also established goals and policies in the Natural Resources and Conservation chapter of the General Plan for the protection of sensitive biological resources such as requiring environmental review of land use decisions and siting development to minimize biological impacts; protection of riparian areas by prohibiting grading within 50 feet of riparian corridors and restricting land use types within riparian areas; and acquisition of high-priority habitat with the intention of establishing a permanent corridor contiguous to the National Forest via Cable Creek and/or Devil Canyon. The City has also established a hillside management overlay district for slopes of 15% or greater where development density is restricted, but that development density can be transferred to encourage larger areas of undeveloped steep slopes.

City of Twentynine Palms

The City of Twentynine Palms General Plan Conservation and Open Space Element (City of Twentynine Palms 2012) identifies the type and location of the important biological resources within the City including 16 special status plant species and 36 special status wildlife species. The City also contains 21 different vegetation communities, some of which are important wetland and riparian areas such as dry lake beds and drainages including the Mesquite Dunes Bosque and Playa Lakebed that is a habitat area containing fairy shrimp, clam shrimp, tadpole shrimp, and water fleas. In addition to identifying important biological resources within the City, the Conservation and Open Space Element discusses regional conservation planning initiatives such as the West Mojave Plan and the Joshua Tree-Twentynine Palms Connection which is a wildlife corridor that spans the ecological transition zone between the Mojave and Sonoran desert eco-regions within the City. The City's policies in the Conservation and Open Space

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

Element encourage the City to participate in the development of the West Mojave Plan and would require development to conduct biological assessments on undeveloped land until the West Mojave Plan is adopted. The City would also enforce a “no net loss” policy of wetland and riparian habitat in the Mesquite Dunes and Bosque Overlay area. Furthermore, the City’s hillside grading, clearing, and plant removal ordinance would place grading requirements on areas of 30% slope or greater.

City of Upland

The city of Upland General Plan Open Space/Conservation Element (1970) indicates that there is little important habitat and few-to-no special status species in the City due to the urbanized nature of the City and the disturbance of land from agriculture. Much of the open space in the City is in the park system, which the City’s General Plan has indicated it is seeking funds to expand. Based on the General Plan goals and policies in the City’s Open Space/Conservation Element there does not seem to be many opportunities for regional conservation planning.

City of Victorville

The City of Victorville’s General Plan 2030 Open Space and Conservation Element (City of Victorville 2008) identifies important biological resources including 34 special status plant and wildlife species and the riparian natural communities associated with the Mojave River, which serves as valuable habitat for a variety of species and as a flyway stopover for some migratory birds. The City’s policies in the Open Space and Conservation Element would encourage restoration and conservation of important habitat for special status species and would generally prohibit development in the Mojave River corridor to protect the important riparian habitat in that area. The City’s policies also specifically support and call for participation in the West Mojave Plan, which would be a mechanism for regional scale conservation planning within the City. Additionally, the City has a slope protection district to ensure the perpetual maintenance and protection of sloped areas through appropriate landscaping and irrigation to reduce erosion in sloped areas.

City of Yucaipa

The City of Yucaipa General Plan Open Space Element (City of Yucaipa 2004) establishes a context for the biological resources in and around the City including the identification of 8 different special status plant and wildlife species. The Open Space Element also contains various goals and policies to protect open spaces and sensitive biological resources as well as promoting long-term conservation planning efforts. Some of the City’s policies would identify important open space and sensitive biological resources to inform land use decisions through the creation

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

of biological resource overlays and identification of wildlife corridors. The Open Space Element also requires mitigation and preservation of biological resources affected by development and land use decisions through the transfer of development rights in resource overlays, mitigation for impacts to sensitive biological resources, and establishment of at least 40% of open space in hillside developments. In addition to these measures, the City also calls for the development of long-term comprehensive conservation plans for native species within the City in Policy OS-4B. Conservation planning could be achieved by using the City's General Plan and in particular through the policies promoting long-term conservation plans and the establishment of open space areas in hillside developments. The City also has a hillside and ridgeline development regulation that limits the amount of buildable land based on the slope of the land, beginning at an average slope of 15%.

Town of Yucca Valley

The Town of Yucca Valley General Plan Open Space and Conservation Element (Town of Yucca Valley 2014) identifies existing important biological resources including 21 special status wildlife species and 11 special status plant species as well as important open space areas and conservation areas including the 306 acre Burns Piñon Ridge Reserve in the northwest portion of the Town. The Open Space and Conservation Element also includes various efforts to protect open spaces and sensitive biological resources including long-term land use and conservation goals and policies. Policy OSC 1-6 and Policy OSC 4-1 call for the preservation and conservation of sensitive biological resources including wildlife corridors and especially sensitive, rare, threatened, or endangered species of plants and wildlife and their habitats. Policy OSC 4-11 and Policy OSC 4-13 encourage new development to coordinate with CDFW and USFWS as well as require biological resources surveys and assessments near Wildlife Corridor Evaluation and Open Space Resource Areas biological resource overlays and Open Space Resource Areas. Conservation planning efforts could work through the Town's General Plan by incorporating the identified sensitive habitat and species areas including Wildlife Corridor Evaluation and Open Space Resource Areas biological resource overlays and Open Space Resource Areas identified in the Town's General Plan Open Space and Conservation Element.

4.1.4 Other Planning Considerations

Land Ownership

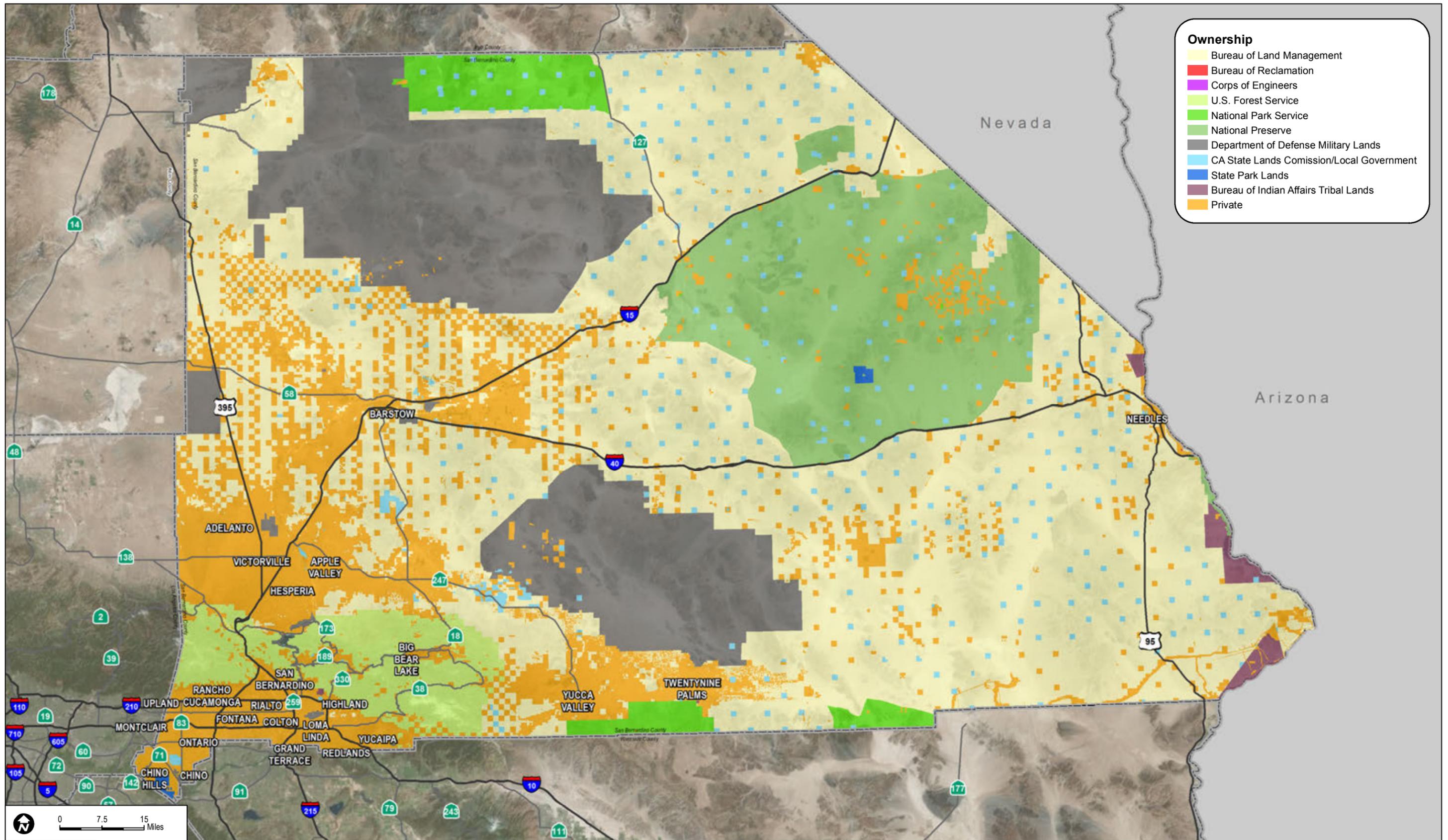
Land ownership can influence land conservation status and management and the scope of the Conservation Framework. Table 4-2 summarizes the land ownership patterns in San Bernardino County in the desert, mountain, and valley regions. Figure 4-2 depicts the land ownership patterns.

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

**Table 4-2
Land Ownership**

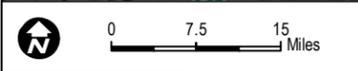
Land Owner Land unit (if applicable)	Desert Region	Mountain Region	Valley Region	Total
California State Lands Commission	248,128	3,572	10,167	261,867
Corps of Engineers	11	--	--	11
Local Government	654	4	--	659
Private	1,845,088	88,343	298,033	2,231,464
Tribal Lands/BIA	66,148	4	803	66,955
Chemehuevi Reservation	35,567	--	--	35,567
Colorado River Reservation	24,324	--	--	24,324
Fort Mojave Reservation	6,095	--	--	6,095
San Manuel Reservation		4	803	807
Twentynine Palms Reservation	162	--	--	162
U.S. Department of Defense	2,145,127	26	4,451	2,149,604
China Lake Naval Weapons Center	575,746	--	--	575,746
Department of Defense	11,824	26	2,355	14,205
Edwards Air Force Base	43,671	--	--	43,671
Fort Irwin National Training Center	752,318	--	--	752,318
George Air Force Base	5,130	--	--	5,130
Marine Corps Installations	6,409	--	--	6,409
Norton Air Force Base	--	--	2,097	2,097
Twentynine Palms Marine Corps Base	750,029	--	--	750,029
United States Bureau of Land Management	5,853,284	153	1,033	5,854,470
United States Bureau of Reclamation	60	--	--	60
United States Fish and Wildlife Service	6,346	--	--	6,346
Fish and Wildlife Service	10	--	--	10
Havasu National Wildlife Refuge	6,336	--	--	6,336
United States National Park Service	1,821,348	469,651	428	2,291,426
Angeles National Forest	4	17,177	13	17,194
Death Valley National Park	214,112	--	--	214,112
Joshua Tree National Park	121,146	--	--	121,146
Mojave National Preserve	1,484,410	--	--	1,484,410
National Park Service	1,385	--	--	1,385
San Bernardino National Forest	292	452,474	415	453,181
Total	11,986,196	561,753	314,915	12,862,864

Source: BLM Land Status dataset (2014)



Ownership

- Bureau of Land Management
- Bureau of Reclamation
- Corps of Engineers
- U.S. Forest Service
- National Park Service
- National Preserve
- Department of Defense Military Lands
- CA State Lands Commission/Local Government
- State Park Lands
- Bureau of Indian Affairs Tribal Lands
- Private



DUDEK

SOURCE: BING Maps 2014; BLM 2014

SANBAG Countywide Conservation Framework

FIGURE 4-2
Ownership

INTENTIONALLY LEFT BLANK

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

4.2 Landscape-scale Biological Resources Summary

The following landscape-scale summary of the biological resources in San Bernardino County is provided to establish the biological resources context for the Conservation Framework. The County spans several distinct ecoregions supporting an incredibly diverse assemblage of plant and wildlife species and natural communities. The summary below is intended to frame, at a broad level using available information and data, the biological resources in the planning area so that principles and recommendations can be developed for the Conservation Framework. It is beyond the scope of the Conservation Framework to provide detailed inventories, descriptions, or analyses of the biological resources found in the County. More detailed biological resources information would be developed, as needed, to support the future planning that builds upon this Conservation Framework.

4.2.1 Plant and Wildlife Species

San Bernardino County supports a wide variety of plant and wildlife species and species habitats. Species diversity in the County is due, in part, to the biogeographic differences and gradients among the valley, mountain, and desert regions of the planning area. The following provides an overview of the species occurrence and designated critical habitat in the County. Additionally, Appendix 4-A and 4-B provide a summary of the wildlife and plant species known to occur in the County, including status and habitat associations. A discussion of data limitations related to plant and wildlife species distributions is also provided below.

Special-status Species Occurrence Summary

Numerous special-status species occur in San Bernardino County. The following provides a summary of species occurrence records, which are one source of information relevant to developing a preservation/conservation framework. The data limitations subsection below discusses limitations of this data and other data, tools, and information that could be employed to characterize species distributions and the distribution of species habitats.

The broad biogeographic differences in the desert, mountain, and valley regions yields distinct differences in the distribution of special-status species and their habitats. Based on an evaluation of species locality data compiled and aggregated from the California Natural Diversity Database, the eBird database, the Bureau of Land Management, the Audubon Society, and other local conservancy data, special-status species with the highest number of reported locality points by region include:

- **Desert Region:** golden eagle, desert tortoise, Mohave ground squirrel, Le Conte's thrasher, burrowing owl, prairie falcon, arroyo toad, Barstow woolly sunflower, Mojave fringe-toed lizard, and Mojave monkeyflower.

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

- **Mountain Region:** California spotted owl, ash-gray Indian paintbrush, Big Bear Valley woollypod, California dandelion, southwestern willow flycatcher, Big Bear Valley milk-vetch, lemon lily, Parish’s alumroot, arroyo toad, and Big Bear Valley phlox.
- **Valley Region:** San Bernardino kangaroo rat, least Bell’s vireo, coastal California gnatcatcher, Delhi Sands flower-loving fly, burrowing owl, Santa Ana River woollystar, Parry’s spineflower, southwestern willow flycatcher, coast horned lizard, and slender-horned spineflower.

USFWS-designated Critical Habitat

The US Fish and Wildlife Service has designated critical habitat within San Bernardino County for nineteen listed species under the ESA (see Figure 4-3 and Figure 4-3a). Critical habitat is designated when a geographical area is considered crucial to the survival of a threatened or endangered species. Once critical habitat is designated, federal agencies must consult USFWS on activities they plan to undertake, fund, or authorize, to ensure that their actions will not destroy or adversely modify the constituent elements of critical habitat for those species. Special limitations on projects in critical habitat are limited to federal actions, however the general protections of the Endangered Species Act protect listed species from “take” regardless of where they are located. Table 4-3 lists the critical habitat designations found within each region.

**Table 4-3
US Fish and Wildlife Service Designated Critical Habitat**

Species Common Name	Desert Region	Mountain Region	Valley Region	Total
Arroyo Toad	4,288	2,886	209	7,383
Ash-Gray Indian Paintbrush	--	1,768	--	1,768
Bear Valley Sandwort	--	1,412	--	1,412
California Taraxacum	--	1,956	--	1,956
Coastal California Gnatcatcher	--	--	7,482	7,482
Cushenbury Buckwheat	594	6,365	--	6,958
Cushenbury Milk-Vetch	1,098	3,272	--	4,369
Cushenbury Oxytheca	118	3,034	--	3,153
Desert Tortoise	3,561,619	--	--	3,561,619
Least Bell's Vireo	--	--	2,061	2,061
Mountain Yellow-Legged Frog	--	2,290	--	2,290
Parish's Daisy	1,654	2,770	--	4,424
San Bernardino Bluegrass	--	1,415	--	1,415
San Bernardino Kangaroo Rat	--	1,533	26,213	27,745
San Bernardino Mountains Bladderpod	--	1,026	--	1,026
Santa Ana Sucker	--	232	2,107	2,339
Southern Mountain Wild Buckwheat	--	903	--	903

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

Table 4-3
US Fish and Wildlife Service Designated Critical Habitat

Species Common Name	Desert Region	Mountain Region	Valley Region	Total
Southwestern Willow Flycatcher	5,195	2,403	1,418	9,017
Thread-Leaved Brodiaea	--	61	--	61

Source: USFWS 2014

Data Limitations

The species occurrence data and USFWS-designated critical habitat described above have inherent limitations, and these data represent just two of many data, tools, and information that could be used to characterize species distributions and the distribution of species habitats in San Bernardino County.

Species occurrence data are useful for conservation planning purposes but the use and limitations of this data should be acknowledged. The occurrence data assembled for this conservation framework are from sources collected at different times, spatial scales, and for different purposes, which can result in an unsystematic and spatially biased occurrence data set. Sampling effort is, for example, far greater in the western portion of the County and near population centers or along roadways as opposed to the eastern and more remote locations of the County. Additionally, species occurrence records only report positive detections and the lack of records does not mean the species is absent.

With regard to USFWS-designated critical habitat, this data is only available for federally listed species for which critical habitat has been designated; therefore, this dataset would not address state-listed species or other special-status species. Designated critical habitat represents areas critical to the conservation of the species, and should not be used to represent the distribution or range known to support the species.

Species range maps and species distribution models represent another class of information/data often used in developing conservation plans.

- Species Range data: Existing information is available for California wildlife species through the CDFW California Wildlife Habitat Relationships (CWHR) data, which provides a range map for many of the wildlife species in the state (Zeiner et al 1990; CDFW 2014). For plant species, the California Native Plant Society maintains the rare and endangered plant inventory that includes a database of USGS 7.5-minute quadrangles where the species has been reported from, which can be used as a surrogate for the species range (CNPS 2014). Use of species range data has advantages over

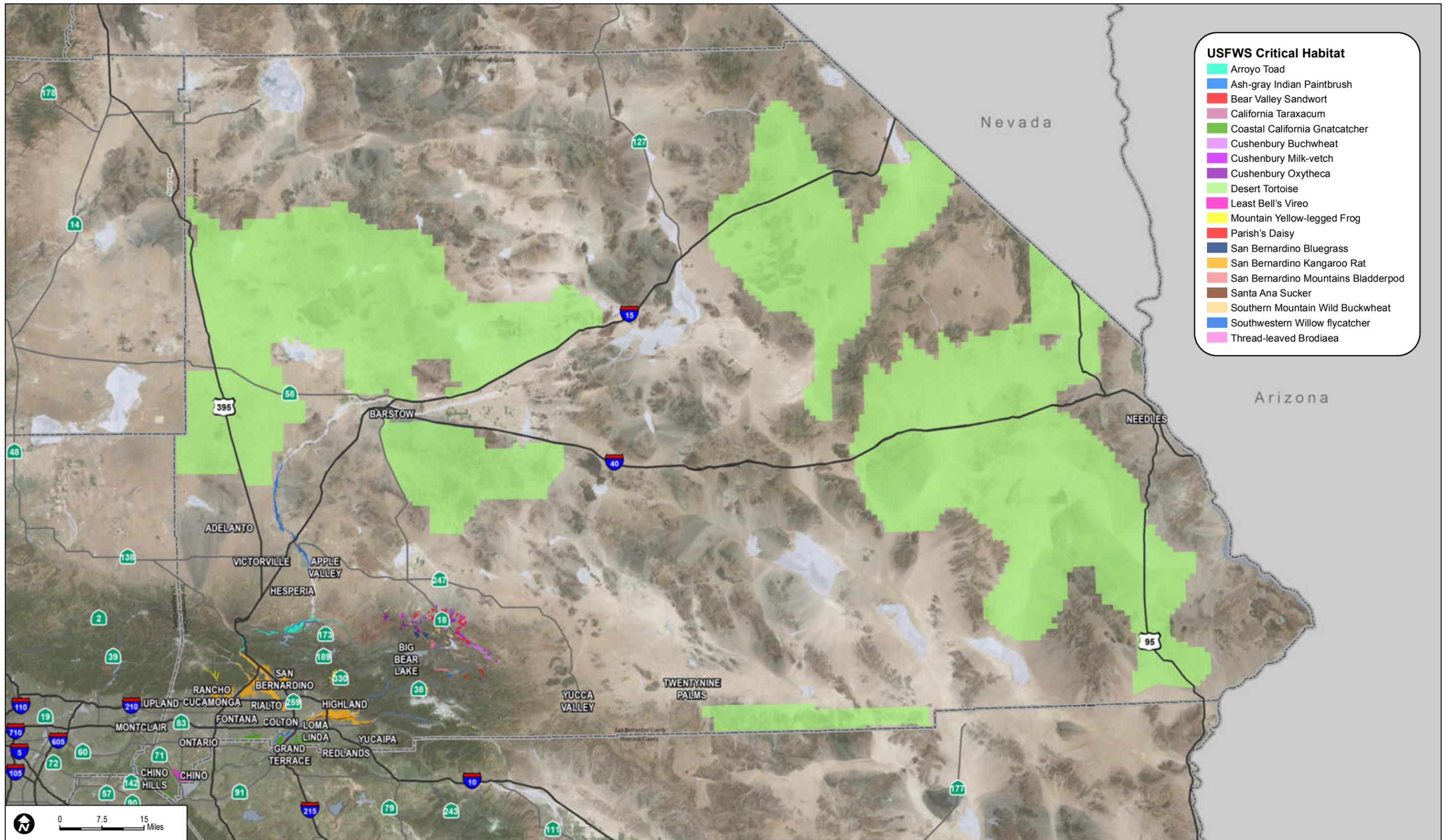
San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

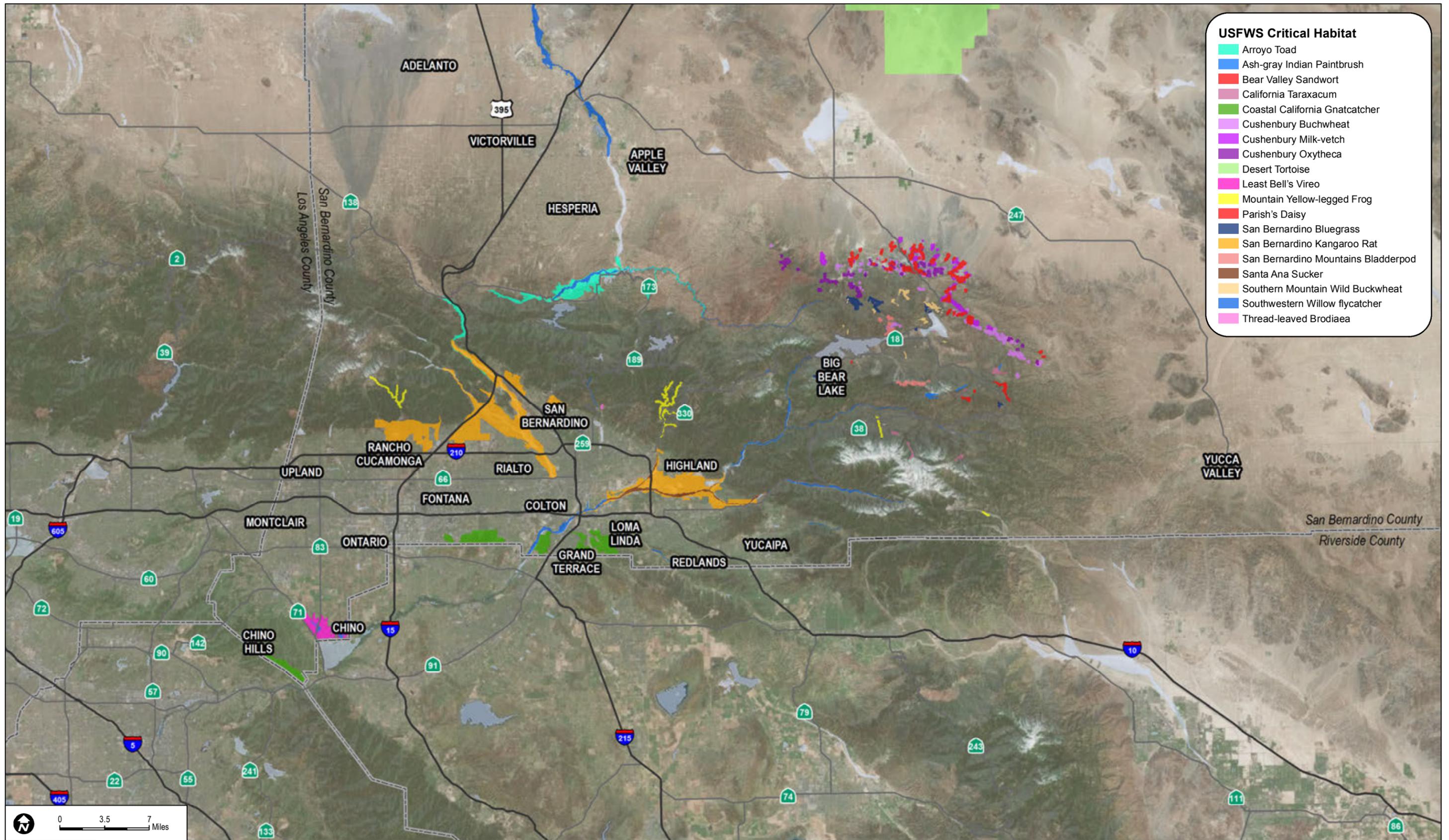
species occurrence information; however, these data can be too “coarse” for some scales of planning (i.e., range data tends to be overly inclusive, often covering areas of unsuitable habitat).

- Species distribution models are often employed in conservation planning to overcome data limitations inherent to species occurrence data and species range data. There are many modeling approaches which can generally be grouped into the following types of models: expert-based (e.g., GIS overlay-type) models, statistically based models, and proxy “models”. Expert-based models identify species distribution by modeling suitable habitat based on scientific literature and expert opinion related to the physical and biological habitat variables known to be affiliated with species occurrence. Statistically based models identify species distribution based on correlations between occurrence data and physical and biological habitat variables. Proxy “models” are geospatial representations of species distributions based on existing data (e.g., polygons created from occurrence data) and are used when expert-based or statistical models are not appropriate for use for the particular species. Numerous existing models are available from various sources at various scales for specific species, and new species distribution models could be developed for specific planning efforts.

Species range data could be useful in selecting focal wildlife species and for the conservation gap analysis; however, species range maps would likely be too coarse for the purposes of developing an HCP or NCCP. Species distribution models would be the appropriate type of data for use in developing an HCP or NCCP; however, the focal list of species would need to be identified prior to determining the type of existing or new model appropriate for the species.



INTENTIONALLY LEFT BLANK



SOURCE: BING Maps 2014; USFWS 2014

DUDEK

SANBAG Countywide Conservation Framework

FIGURE 4-3a
USFWS Critical Habitat - Mountain and Valley Regions

INTENTIONALLY LEFT BLANK

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

4.2.2 Natural Communities

As previously noted, San Bernardino County’s biogeographic heterogeneity generates high biological diversity, meaning that there are a variety of natural communities. Natural communities are often defined by conspicuous trends in vegetation and are forced by geography and climate, among other things. These aggregations support specific biological resources that may not be found in other communities. It is therefore important to preserve the mosaic of natural communities that exist, in order to ensure biodiversity can be maintained. Table 4-4 lists the major natural community types within the County by region and Figure 4-4 and Figure 4-4a depicts these areas.

Table 4-4
Natural Communities by Region

Natural Community / Land Cover	Desert Region	Mountain Region	Valley Region	Total
California forest and woodland	37,662	239,521	883	278,067
Chaparral and coastal scrub	58,872	211,583	49,232	319,686
Desert conifer woodlands	181,991	67,501	31	249,524
Desert outcrop and badlands	808,702	7,914	9,454	826,071
Desert Scrub	9,540,161	18,152	1,931	9,560,244
Dunes	164,680	--	--	164,680
Grassland	75,846	3,723	58,072	137,641
Other Land Cover	277,932	5,089	189,665	472,685
Riparian	438,703	2,707	1,582	442,992
Wetland	404,924	4,788	386	410,099
Total	11,989,473	560,978	311,238	12,861,688

Source: VegCAMP CDFW and AIS 2013, AIS 2013, CDFG 2012, and San Bernardino County Museum 2013

Notes: Natural communities mapping is based on multiple sources that have been summarized here at a common, aggregated “General” community level. Finer resolution mapping information is available; however, the vegetation classification systems used differs between sources. Other land cover includes urban, disturbed, and agricultural land covers.

The vegetation layer has been assembled from multiple sources using different mapping methodologies and classification systems. For use in this document, the vegetation classification system has been crosswalked (i.e., a table that shows equivalent elements or fields from more than one database) into a common system; however, this common system necessitates aggregating areas of fine-grained alliance-level data into coarser vegetation classes.

4.2.3 Habitat Linkages and Wildlife Movement

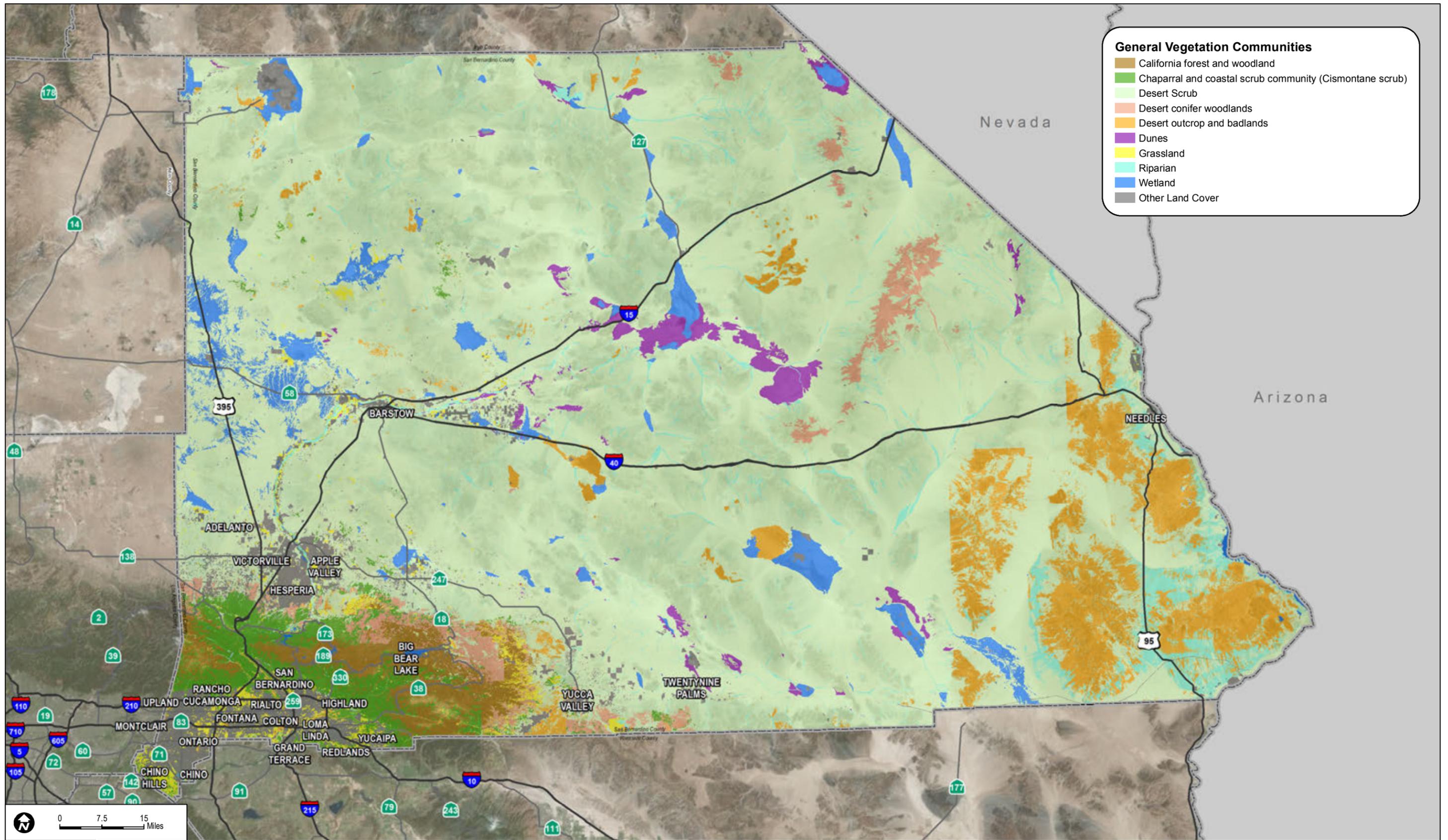
Habitat linkages are landscape-scale open space areas that provide a natural habitat connection between at least two larger adjacent open spaces or habitat areas. Habitat linkages provide a large enough area to support, at a minimum, a natural habitat mosaic and viable populations of smaller

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

terrestrial species and allow for gene flow through diffusion of populations over a period of generations. Habitat linkages also allow for jump dispersal for some species between neighboring habitats. Habitat linkages may be large tracts of natural open space that serve as resident species habitat or habitat linkages may serve primarily as landscape connections (i.e., for dispersal movements or travel).

Species-specific analyses, studies, and modeling are often conducted to determine the specific habitat linkages used by species in specific study areas. In addition to species-specific information, landscape-level habitat linkage information is available that models and maps habitat linkages using the concepts of “least cost” and “land facets”. This approach characterizes areas with uniform physical characteristics (land facets) to model the least cost for movement between habitat blocks for focal species. The California Desert Connectivity Project (Penrod et al. 2012) used this approach for the California deserts, including the desert region of San Bernardino County. A Linkage Design for the Joshua Tree–Twentynine Palms Connection (Penrod et al. 2008) used this approach for the Morongo basin area of San Bernardino County. In *South Coast Missing Linkages: Restoring Connectivity to Wildlands in the Largest Metropolitan Area in the USA*, Beier et al. (2006) used a similar approach to delineate habitat linkages. Table 4-5 and Figure 4-5 summarizes these mapped habitat linkages by region in the planning area.



General Vegetation Communities

- California forest and woodland
- Chaparral and coastal scrub community (Cismontane scrub)
- Desert Scrub
- Desert conifer woodlands
- Desert outcrop and badlands
- Dunes
- Grassland
- Riparian
- Wetland
- Other Land Cover



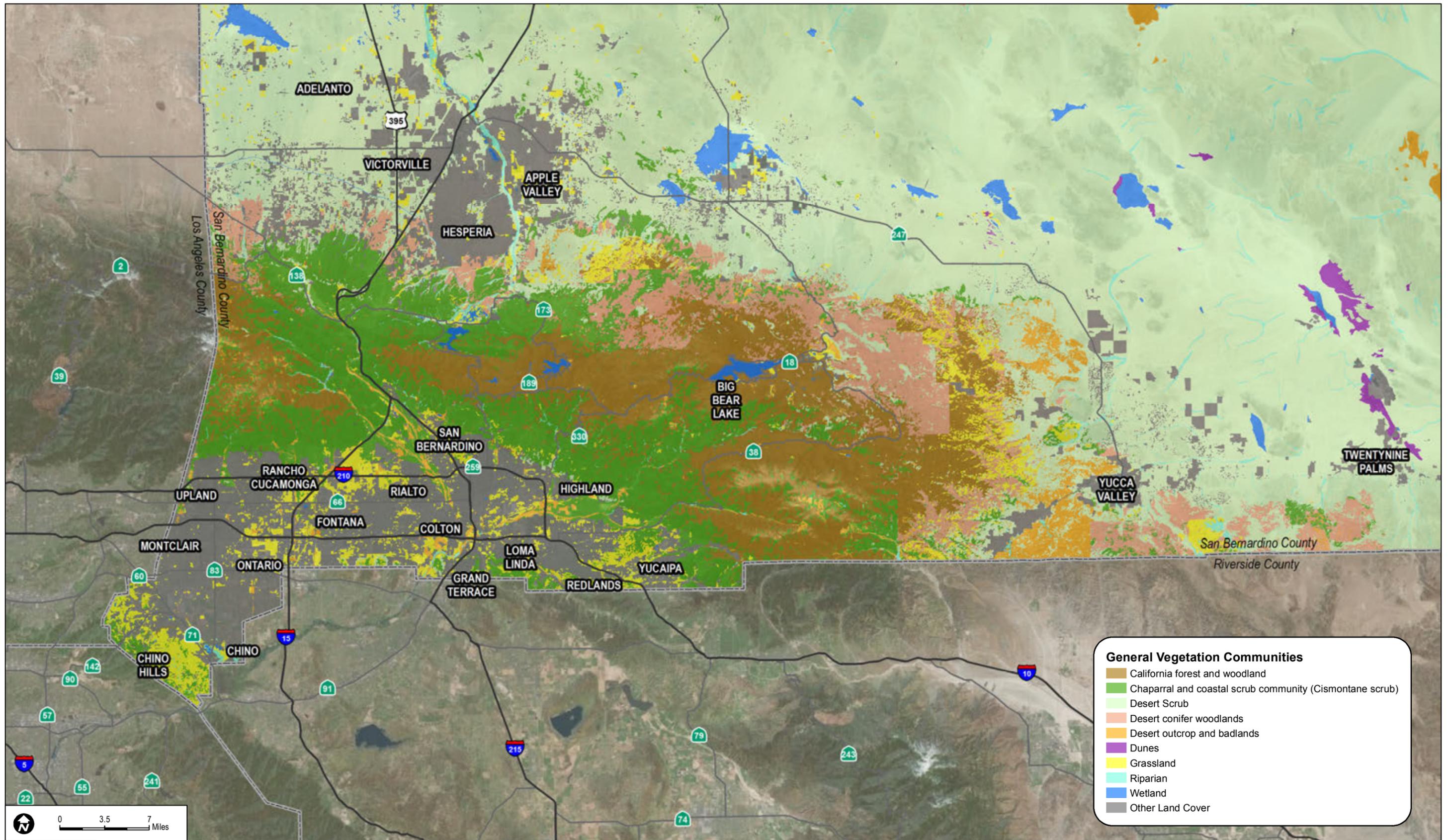
SOURCE: BING Maps 2014; CDFW 2013; San Bernardino County Museum 2013

DUDEK

SANBAG Countywide Conservation Framework

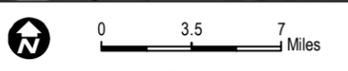
FIGURE 4-4
Natural Communities

INTENTIONALLY LEFT BLANK



General Vegetation Communities

- California forest and woodland
- Chaparral and coastal scrub community (Cismontane scrub)
- Desert Scrub
- Desert conifer woodlands
- Desert outcrop and badlands
- Dunes
- Grassland
- Riparian
- Wetland
- Other Land Cover



DUDEK

SOURCE: BING Maps 2014; CDFW 2013; San Bernardino County Museum 2013

SANBAG Countywide Conservation Framework

FIGURE 4-4a
Natural Communities - Mountain and Valley Regions

INTENTIONALLY LEFT BLANK

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

Additionally, Riparian corridors are also known to provide habitat linkages and support the movement of wildlife, especially in urbanized areas. See Table 4-5 and Figure 4-5 for a summary of the mapped riparian natural communities in the planning area.

**Table 4-5
Habitat Linkages by Region**

Mapped Habitat Linkage	Desert Region	Mountain Region	Valley Region	Total
Desert Linkage Network	2,681,061	7,943	--	2,689,004
South Coast Missing Linkages	56,956	104,373	21,561	182,890
Joshua Tree – Twentynine Palms Linkages	281,390	--	--	281,390

Source: Penrod et al. 2012, Beier et al. 2006, Penrod et al. 2008

Notes: Mapped habitat linkages summarized here are based on aggregated least cost corridor modeling analyses conducted for multiple species connecting existing core habitats at the landscape scale. The identification of habitat linkage and movement corridors for individual species or the identification of habitat linkages at smaller scales would require separate analyses. Linkages from each data source may overlap.

4.2.4 Physical Conditions

Physical conditions across the landscape play important roles in the distribution of biological resources. The following provides an overview of some key physical characteristics in the planning area.

Geomorphology and Hydrology

Geomorphological characteristics include surficial relief patterns and landforms. The three regions of the planning area capture the coarse geomorphological characteristics of the planning area: the valley region, the mountain region, and the desert region. The valley region is characterized by a coastal slope – fan landform. The mountain region is characterized by the San Bernardino Mountain Range. The desert region is characterized by the high desert of the western Mojave Desert.

San Bernardino County includes all or portions of 15 watersheds (DWR 2004). See Section 5.3.3 (Table 5-3) under the discussion of watershed-based subareas for a description of the watersheds in the planning area. Major water bodies in the planning area include: Mojave River, Colorado River, Amargosa River, Santa Ana River, Cajon Wash, Lytle Creek, Silverwood Lake, Lake Arrowhead, Big Bear Lake, and numerous dry lakes in the desert region. Smaller creeks, washes, ephemeral drainages, and seeps/springs occur throughout the planning area.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

Aeolian Processes

The transport and deposition of aeolian sediments, particularly in the desert, is one of the major processes that shape the landscape, including desert pavement and dune systems. Dry washes and alluvial fans provide important source areas for Aeolian systems from which sediments are transported to deposition areas (e.g., dunes). Substantial sand source and dune systems occur in the County, including the Ibex Dunes, Dumont Dunes, Kelso Dunes, Harper Dry Lake, and miscellaneous unnamed dune and sand resource areas.

4.3 Conservation Framework Considerations

Based on the regulatory and planning context and landscape-scale summary of biological resources provided above, the following describes considerations for the development of the Conservation Framework for San Bernardino County.

Establishing a framework for conservation in San Bernardino County should consider and incorporate into the planning process:

- Areas with Existing Protections
- Other Land Designations
- Identified Conservation Gaps
- Distribution of special-status and sensitive species and habitats

INTENTIONALLY LEFT BLANK

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

Areas with existing protection include lands that have been legislatively designated as protected lands and are administered by federal or state mandates, including National Parks (e.g., Joshua Tree National Park and Death Valley National Park), National Preserves (e.g., Mojave National Preserve), National Forests (e.g., San Bernardino National Forest), BLM Wilderness, and CDFW Ecological Reserves. Additionally, areas with existing protection include lands held by local entities, land trusts, and lands with conservation easements or other legal mechanism providing resource protection. An element of developing this Conservation Framework was to gather local information from jurisdictions in the county and parallel planning efforts being conducted by Southern California Association of Governments (SCAG) to identify local conservation and mitigation efforts. See Section 2 for a summary of the compiled information for this study.

Other land designations include lands administered or designated for specific uses. For the Conservation Framework, these would include:

- Department of Defense (DOD) administered lands (e.g., Marine Corps Air Ground Combat Center Twentynine Palms)
- Tribal Lands
- BLM Land Use Plan Designations on BLM administered lands (e.g., Areas of Critical Environmental Concern, new designations being proposed under the Draft DRECP (National Landscape Conservation System lands), and Special Recreation Management Areas)
- General Plan land use designations; Hillside ordinances; Specific Plans

Although military lands and tribal lands are geographically located within San Bernardino County, these areas would generally not be considered within the planning envelope for the Conservation Framework because they are managed under separate, existing management regimes. As such, the Conservation Framework would essentially be developed outside the boundary of these lands.

BLM Land Use Plan designations and General Plan land use designations may be useful in characterizing and classifying lands as part of the Conservation Framework. For example, Areas of Critical Environmental Concern (ACECs) on BLM-administered lands are managed for resource protection by the BLM; therefore, these lands would be categorized as having a protection/management class within the Conservation Framework. Lands with General Plan land use designations related to open space would be considered in the conservation planning, but such designations themselves do not provide protection or management. Conversely, lands with General Plan land use designations related to residential, commercial, or industrial uses would not typically be compatible with conservation. Through this process, lands can be classified by

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

their protected land status. Additional information from existing protected lands databases (i.e., CPAD [GreenInfo Network 2014] and PAD-US [USGS 2012]) can inform this process. The California Protected Areas Database (CPAD) is a GIS inventory of open space lands that are owned by agencies or nongovernmental groups. CPAD includes federal, state, and county parks, wildlife refuges, regional and county preserves, some land trust holdings, trust lands, and forests. CPAD data is useful for multi-jurisdictional planning, including land use plans and habitat conservation programs. CPAD is part of the Protected Areas Database of the United States (PAD-US), which is a national program to improve protected land inventories.

By classifying lands in this manner, conservation gaps can be identified where biological resources prioritized for conservation are located in areas with low or no protected status. An analysis of conservation gaps would identify and map these locations and should be considered as part of next steps for the Conservation Framework (see Section 7). A preliminary mapping of existing conservation areas and conservation gaps in San Bernardino County is provided in Figures 4-6–4-6d (Conservation and Open Space Areas) and Figures 4-7–4-7d (Listed and Sensitive Species Occurrence) and are discussed in section 4.3.2 below.

4.3.1 Regional Considerations

Establishing a framework for conservation in San Bernardino County should consider regional similarities and differences across San Bernardino County, including regional considerations related to:

- Existing and planned land uses
- Ownership patterns
- Locations of special-status species, natural communities and ecological processes.

For example, lands in the valley region are composed largely of developed residential and commercial infrastructure. Alternatively, the desert and mountain regions contain high proportions of open space lands, conserved on the state and federal level. In terms of ownership patterns, lands in the desert and forest regions are administered primarily by federal agencies, 82% and 84% respectively. In the Valley region, 95% of the land is privately owned. An effective conservation strategy would be tailored to fit these geographic differences by employing suitable conservation approaches/tools for each region. Section 5 describes potential approaches to allocating San Bernardino County into subareas, which would facilitate crafting conservation strategies to match specific regions.

INTENTIONALLY LEFT BLANK

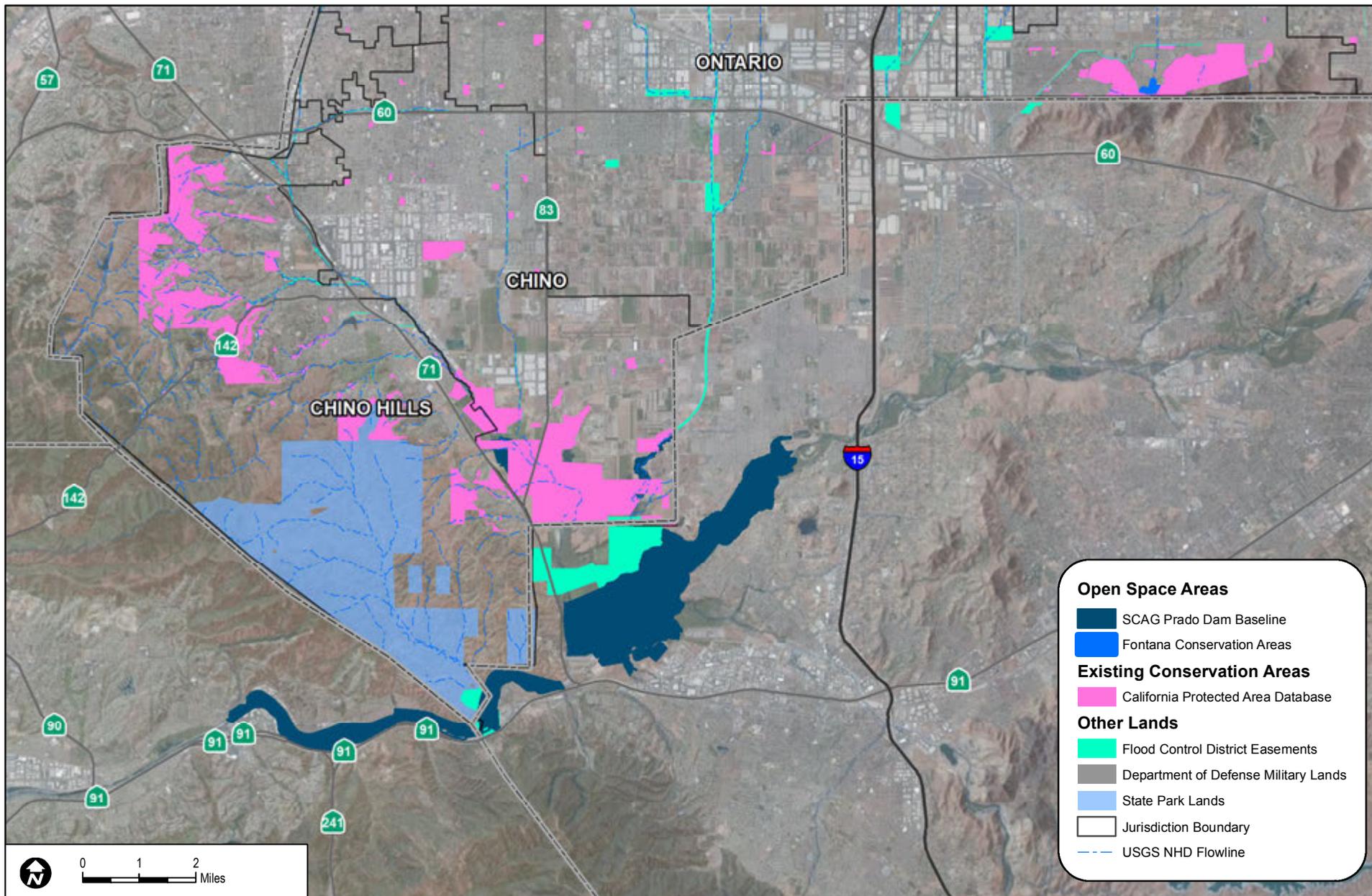
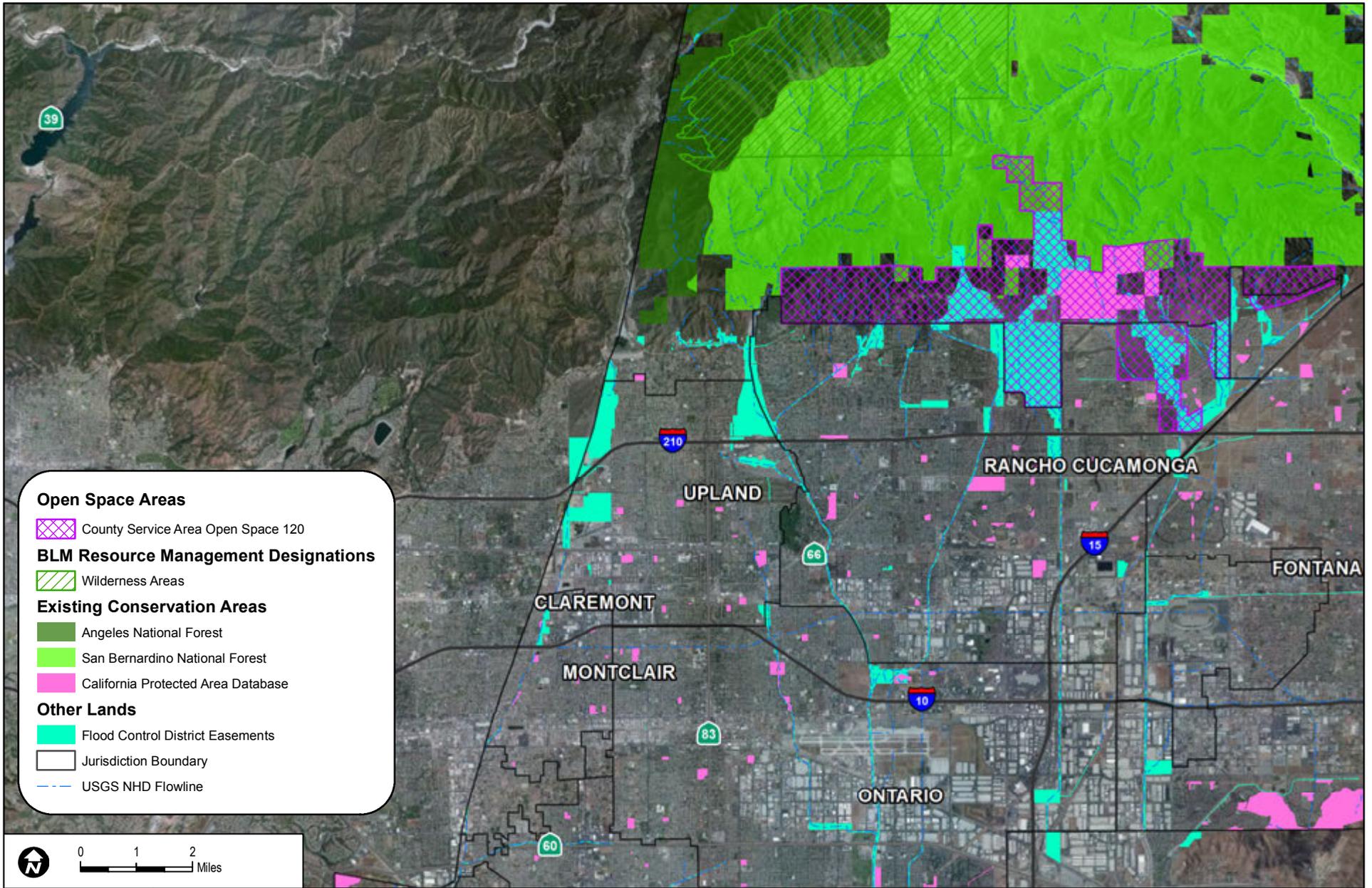


FIGURE 4-6a
Conservation and Open Space Areas - Valley Region

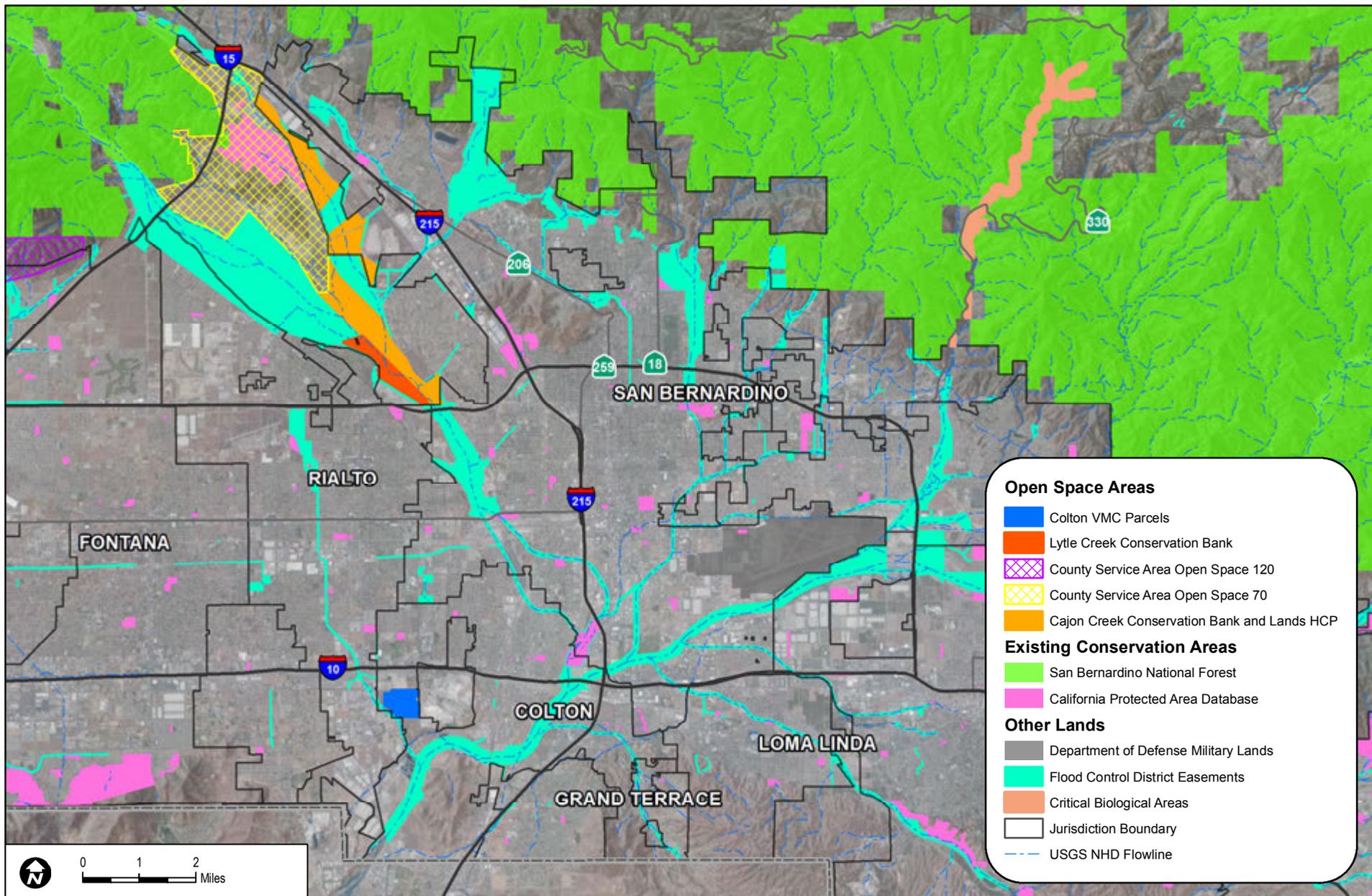
San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development

INTENTIONALLY LEFT BLANK



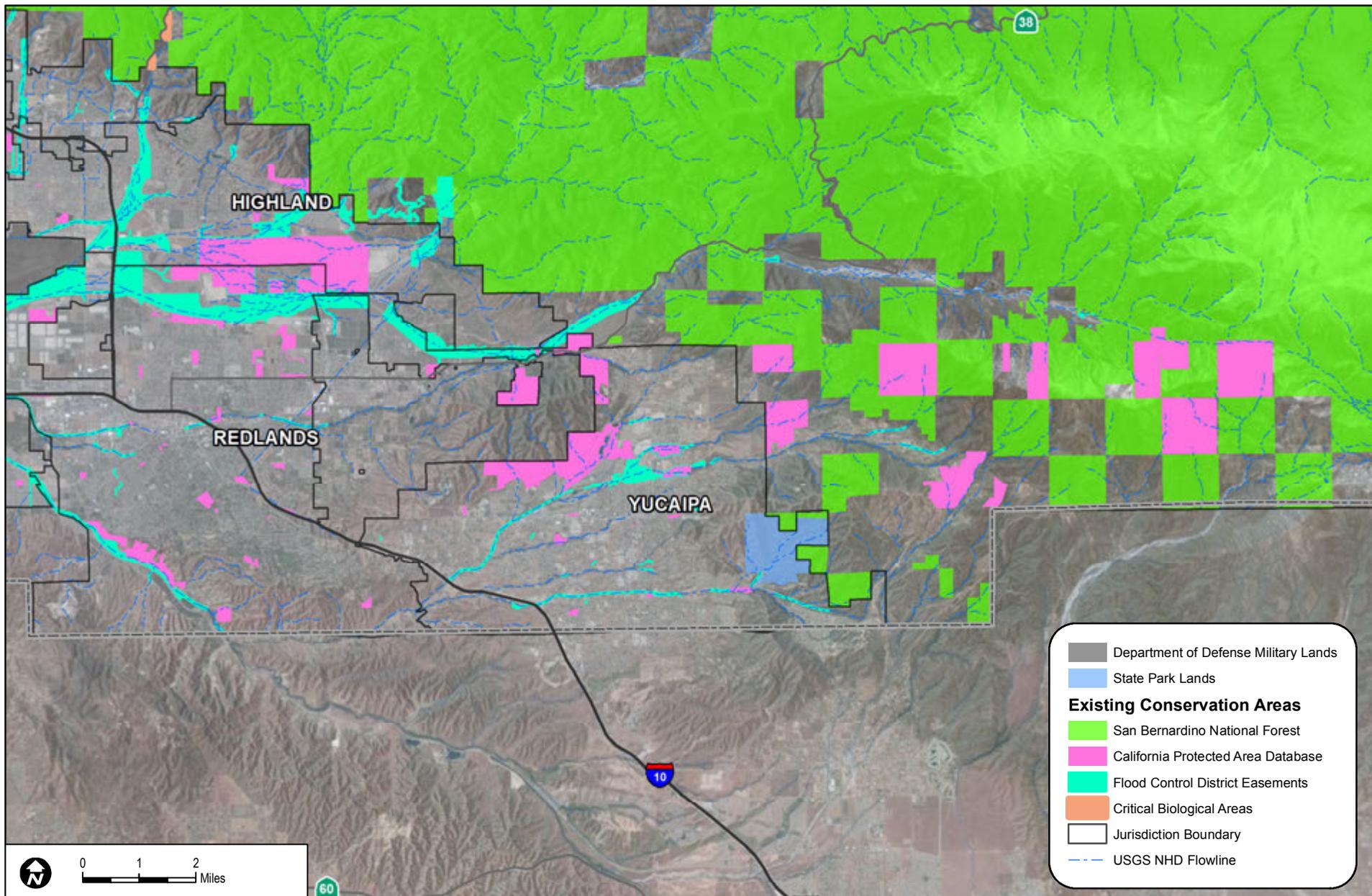
San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development

INTENTIONALLY LEFT BLANK



San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development

INTENTIONALLY LEFT BLANK



DUDEK

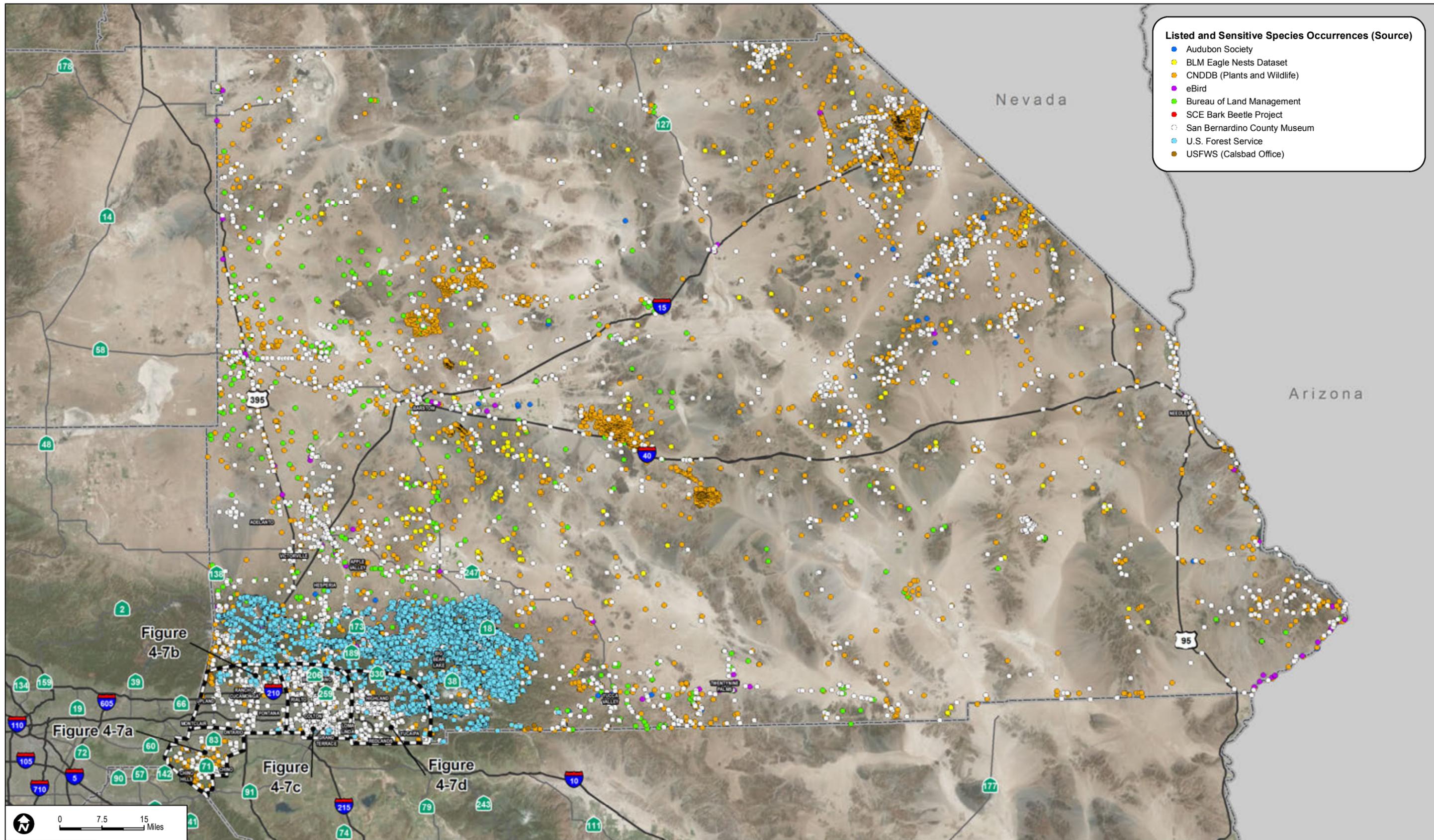
SOURCE: BING Maps 2014; BLM 2014; CPAD 2014; USGS 2012

SANBAG Countywide Conservation Framework

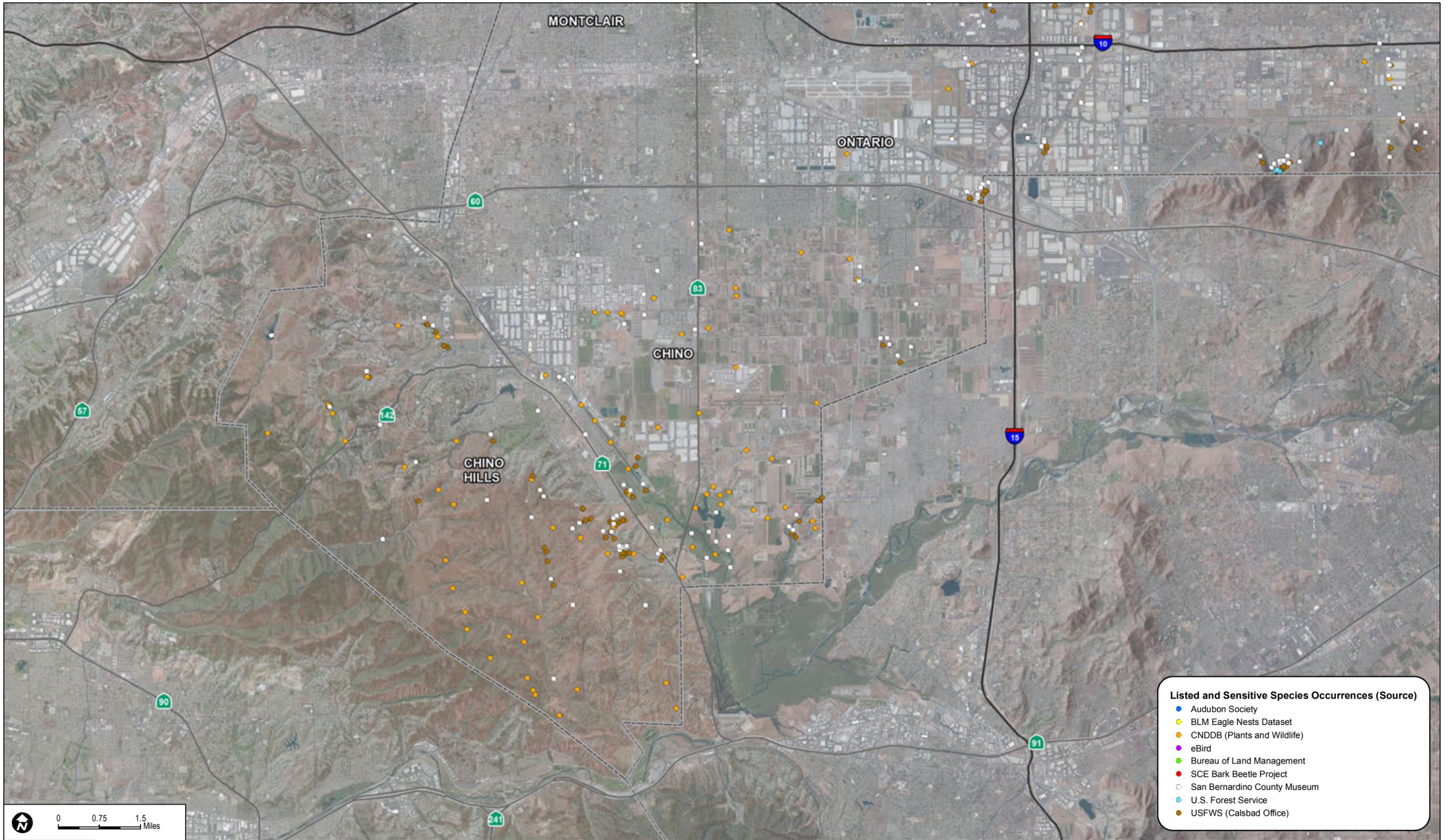
FIGURE 4-6d
Conservation and Open Space Areas - Valley Region

San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development

INTENTIONALLY LEFT BLANK



INTENTIONALLY LEFT BLANK



- Listed and Sensitive Species Occurrences (Source)**
- Audubon Society
 - BLM Eagle Nests Dataset
 - CNDDB (Plants and Wildlife)
 - eBird
 - Bureau of Land Management
 - SCE Bark Beetle Project
 - San Bernardino County Museum
 - U.S. Forest Service
 - USFWS (Calsbad Office)

0 0.75 1.5 Miles

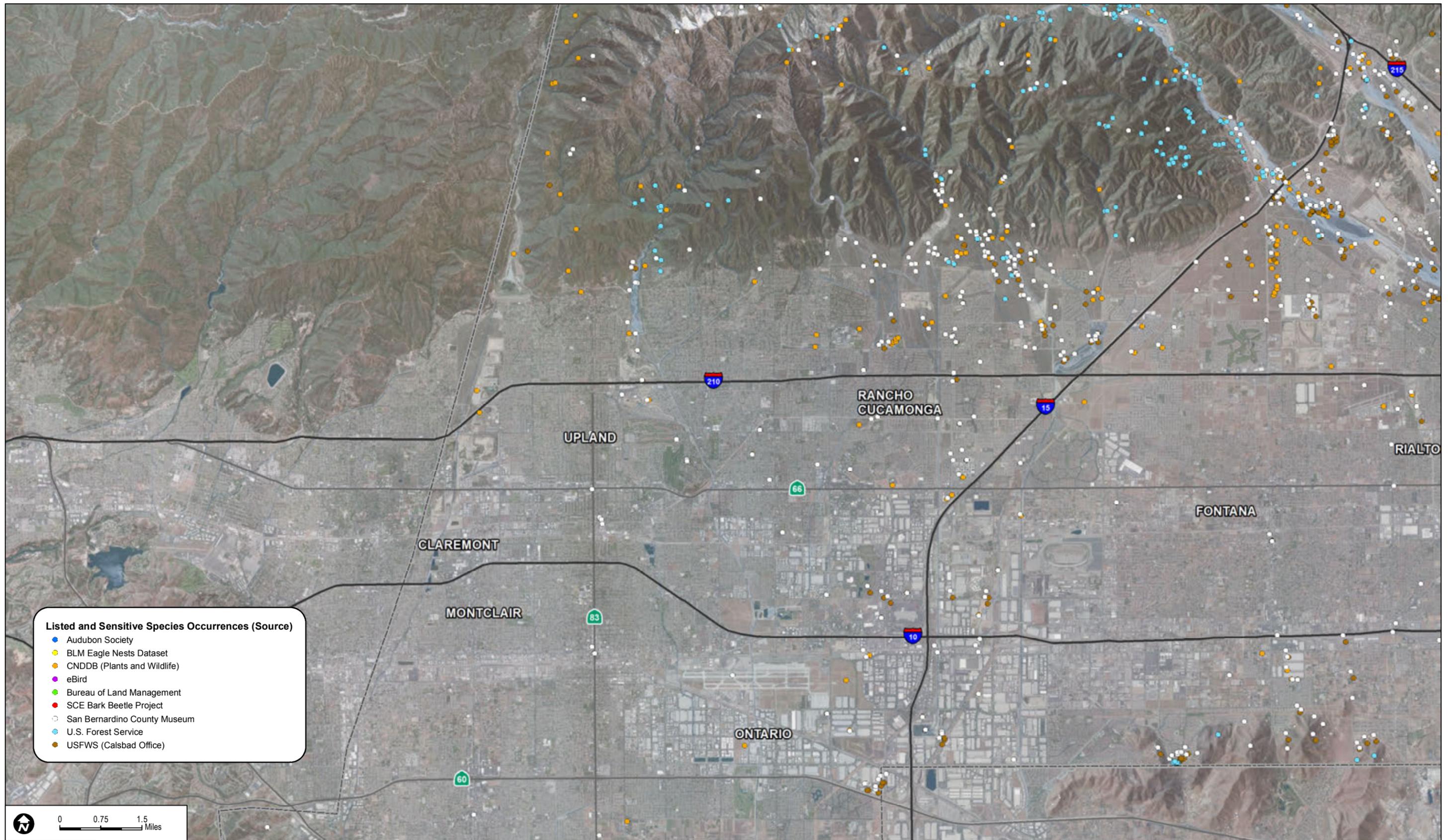
DUDEK

SOURCE: BING Maps 2014

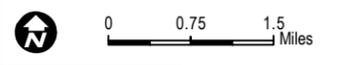
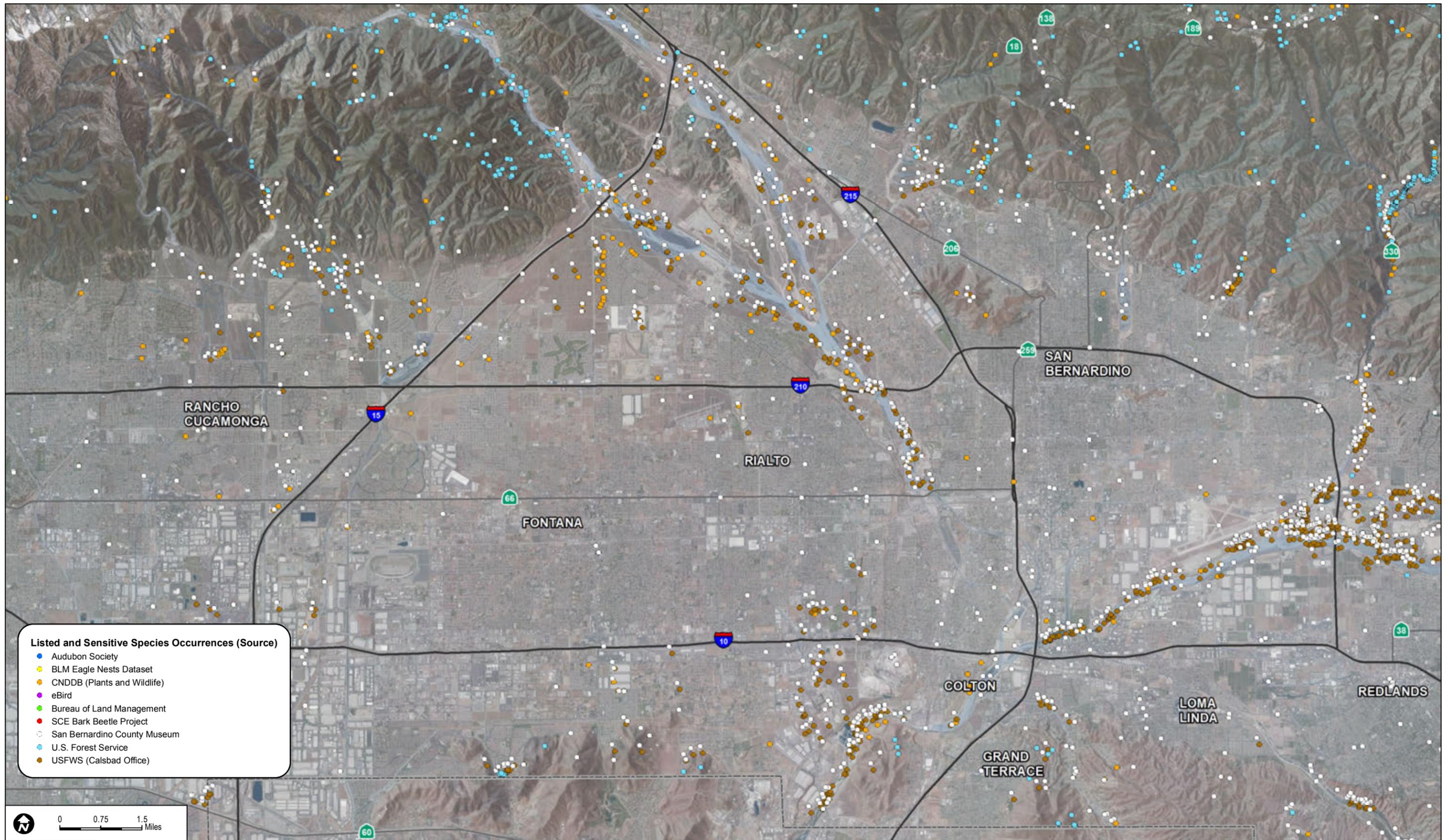
SANBAG Countywide Conservation Framework

FIGURE 4-7a
Species Occurrence - Valley Region

INTENTIONALLY LEFT BLANK



INTENTIONALLY LEFT BLANK



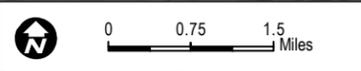
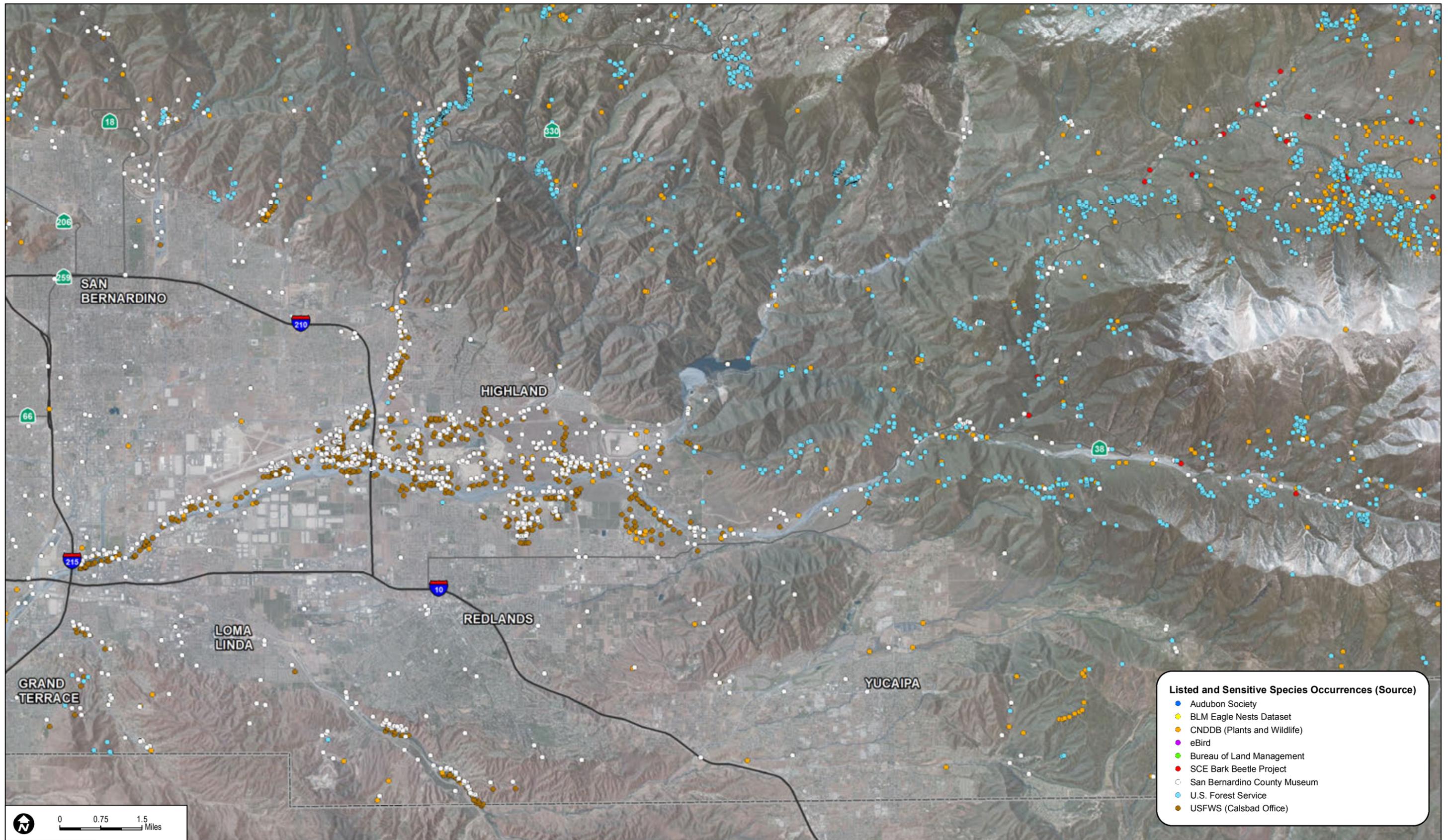
DUDEK

SOURCE: BING Maps 2014

SANBAG Countywide Conservation Framework

FIGURE 4-7c
Species Occurrence - Valley Region

INTENTIONALLY LEFT BLANK



DUDEK

SOURCE: BING Maps 2014

SANBAG Countywide Conservation Framework

FIGURE 4-7d
Species Occurrence - Valley Region

INTENTIONALLY LEFT BLANK

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

4.3.2 Preliminary Gap Analysis

An important tool in developing a conservation strategy is to conduct a “gap analysis.” A gap analysis evaluates the distribution of high value biological resources (e.g., natural communities, species distributions, and known occurrence data) relative to the distribution of protected lands (areas protected and managed to maintain biological resource value) to identify any “gaps” in protection (e.g., high value biological resources that are on private lands and not well protected). In this way, a gap analysis is used to identify gaps in representation, gaps in ecological processes or functions, and gaps in management of existing protected areas.

The results of a gap analysis are useful in prioritizing species for conservation and setting species and natural community conservation goals. Conservation gaps may also occur where important habitat connectivity between large areas of protected lands are not currently protected, leaving areas for wildlife movement and gene flow between populations (i.e., wildlife corridors and landscape linkages) at risk. As outlined in Section 7 of this report, a detailed Gap Analysis will need to be completed in the future, along with other steps necessary to reach a Gap Analysis.

For the purposes of this report, a preliminary gap analysis can be reached for the three planning regions within the County by evaluating existing conservation and open space areas (Figures 4-6–4-6d) in relation to listed and sensitive species occurrence data (Figures 4-7–4-7d). Opportunities exist for conservation that tiers off of current conservation and open space areas. Furthermore, species distributions can inform future development planning. The following presents an overview of the varying conservation potentials for each region.

Desert Region

The desert region is predominantly in government land ownership (Figure 4-2 and Table 4-2), therefore a conservation strategy should build off of federal and state land management and conservation actions and responsibilities (e.g., BLM designated use areas, BLM Land Management Plans, HCPs). Areas where there are gaps in existing conservation/protectations are fewer for the desert region. Gaps in conserved or protected lands occur in and around the cities/towns and some scattered portions throughout the desert. Therefore, future conservation and land acquisitions may focus on securing protected lands that connect these areas to the surrounding government lands. Some of these areas correspond to planned or mapped wildlife habitat linkages (Figure 4-5).

One major consideration for the Desert Region is the proposed Desert Renewable Energy Conservation Plan (DRECP). The DRECP provides a plan to identify development focus areas that may accommodate renewable energy projects and associated transmission in the California

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

desert over the next 25 years. The plan also identifies conservation areas, sensitive plant and wildlife species, and a management strategy. The DRECP will help provide conservation of desert ecosystems while facilitating the timely permitting of appropriate development of renewable energy projects. The DRECP provides a species permitting strategy through the USFWS, or a General Conservation Plan (GCP). This GCP could be used by the Desert Region jurisdictions as a template or means to facilitate species or waters permitting for future renewable energy projects. The proposed Town of Apple Valley MSHCP also provides an opportunity for surrounding jurisdictions to build off of a comprehensive conservation strategy.

Mountain Region

The majority of the mountain region is owned by the federal government as National Forest lands (Figure 4-2 and Table 4-2). Future development actions and land uses would be limited by the management priorities described for federal lands, therefore, a separate conservation plan or strategy for local jurisdictions is likely not warranted. Similar to the desert region, gaps in existing conservation are few; areas in and around jurisdictions represent the remaining conservation gaps. Project-by-project conservation planning that is coordinated with the Federal government and tiers off of existing federal and state open space and conservation areas is an advisable option.

Valley Region

With 95% of lands in private ownership (Figure 4-2 and Table 4-2), the Valley Region provides the most development potential in the County. As supported by the Vacant Land Study prepared for the San Bernardino County Vision project (San Bernardino County 2011), the Valley region has the least amount of potential development constraints in the form of mining, water infrastructure/developed lands, highways and major roads, residential density, lands in planning boundaries, sensitive agricultural lands, and sensitive habitats.

A preliminary gap analysis for the Valley Region identified potential future conservation focus areas by considering planned development (Figure 4-1), designated Critical Habitat (Figure 4-3a), existing conserved or open space areas (Figure 4-6a–4-6d), and known special-status and sensitive species occurrences (Figure 4-7–4-7d). The two primary conservation focus areas are:

- Valley foothills, and
- Drainages associated with the Santa Ana River watershed.

The foothills of Rancho Cucamonga, Rialto, San Bernardino, Highland, and Yucaipa have existing conservation areas (e.g., CSAs, mitigation or conservation banks, protected areas or

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

open space), support designated Critical Habitat for San Bernardino kangaroo rat, and/or provide habitat for many special-status and sensitive species. Because these areas abut existing protected and managed National Forest Service lands, a comprehensive conservation strategy should consider maximizing these existing conservation areas by linking currently unprotected properties that support important biological resources (conservation gaps) to the adjacent protected federal agency lands. Additionally, County Flood Control easements which occur throughout the Valley region may facilitate habitat connectivity for this area's relatively abundant and diverse species composition. The Valley region supports important hydrological processes associated with the Santa Ana River watershed. County Flood Control easements occur on a large portion of the major drainages within this region (Figure 4-6a–4-6d). Although County Flood Control has responsibilities to provide flood protection and water conveyance to all citizens of the County, the drainage areas also support habitat for many riparian or drainage-associated species in the Valley. For example, the San Bernardino kangaroo rat (SBKR), a species that is federally listed as endangered, is well documented to occur within the Valley region, and is associated with drainages (alluvial floodplains and adjacent upland habitats). A comprehensive conservation strategy to conserve potential and occupied SBKR habitat would facilitate permitting for development projects that occur within or adjacent to occupied drainages and/or designated Critical Habitat. Additionally, future impacts associated with new construction, and operation and maintenance activities will be subject to Waters of the U.S. and Waters of the State permit requirements which typically also incorporate considerations for listed and sensitive species impacts.

One key component to a future conservation strategy for the Santa Ana River watershed is the draft Upper Santa Ana River Habitat Conservation Plan (Upper SAR HCP) located mostly in the City of Highland. This draft HCP is being led by the San Bernardino Valley Water Conservation District and is expected to provide a conservation strategy to facilitate development in and along the Santa Ana River, while providing for conservation of key species and habitats. The Upper SAR HCP may be the foundation for which additional conservation could build on. Future conservation should consider securing conserved habitat and open space that provides an ecological and biological connection to the Santa Ana River which is currently lacking for some upstream and downstream areas. Therefore, the Valley drainages and associated upland habitats represent a gap in conservation which also provides an opportunity for a future conservation focus.

4.3.3 Economic Development and Streamlining Considerations

The presence of biological resources on proposed project sites has the potential to lengthen project development timelines and increase project development and mitigation costs. Conventional project-by-project permitting involving federal or state listed species would require

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

consultation with the USFWS under ESA Section 7 or development of a project-specific HCP under ESA Section 10 and/or CESA Section 2080.1 or Section 2081 permitting processes for state listed species. Project permitting under a regional multi-species HCP/NCCP (ESA Section 10 and CESA Section 2835) provides a means to streamline these permitting processes by allowing local jurisdictions to extend their incidental take authority to individual development projects and research has shown that comprehensive approaches to habitat conservation planning through HCPs has provided economic benefits to projects through reduced uncertainty, time delays and compliance costs (Economic and Planning Systems, Inc. 2014). Exhibit 4-1 illustrates these typical processes.

The conventional project-by-project permitting process is typically characterized by:

- Numerous review cycles with multiple agencies
- Potentially lengthy and uncertain approval process
- Higher costs for project proponents
- Project proponent required to identify and provide necessary mitigation; Results in piecemeal, often ineffective mitigation
- For projects involving impacts to federally listed species, Section 7 would require federal nexus; without a federal nexus, a project-specific Section 10 HCP would need to be developed
- Project proponent responsible for maintenance and monitoring of mitigation lands

Project permitting under an approved regional multi-species HCP/NCCP is typically characterized by:

- Streamlined, local project permitting process
- Certainty in project approval process (e.g., schedule and costs)
- Coordinated conservation and mitigation strategy
- Greater mitigation flexibility
- Upfront Plan development and ongoing Plan implementation costs for local agencies
- Provides for a comprehensive approach and funding mechanism for maintenance and monitoring of mitigation lands

**San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development**

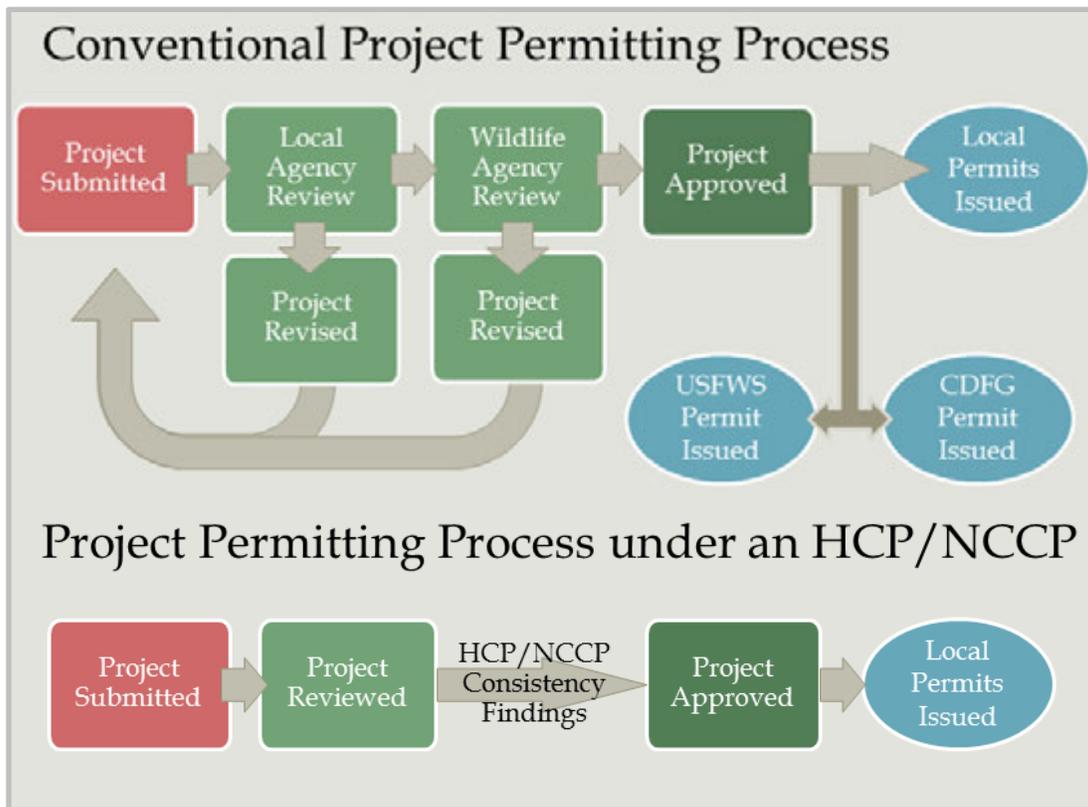


Exhibit 4-1. Schematic contrasting the conventional project permitting process and the project permitting process under an approved HCP/NCCP

4.3.4 Regulatory and Implementation Structure Considerations

Development of a conservation framework should consider various regulatory and implementation structures that would accompany potential conservation strategies. Under the status quo, proposed development projects are reviewed and approved as outlined above in Section 4.3.3 on a project-by-project basis. Mitigation for development projects under the project-by-project approach is provided, if necessary, on a piecemeal basis without a comprehensive conservation strategy or land management strategy. The existing regulatory and implementation structures would remain in place under the status quo approach.

A regional multi-species HCP/NCCP approach can differ in regulatory and implementation structures. Two potential regulatory and implementation structures are outlined below.

- **Comprehensive Plan:** This type plan would have the broadest coverage of activities (i.e., future projects) and Permittees (i.e., participants). Because such a plan is intended to be comprehensive, it has advantages during implementation across the entire planning area;

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

however, there are often challenges to get the plan to approval. A comprehensive plan would require involvement of Permittees, some of which may not have equal realized benefits through the comprehensive plan. Also, a comprehensive plan typically includes compromise between all stakeholders to reach an approval status with the Permitting Agencies (i.e., US Fish and Wildlife Service and California Department Fish and Wildlife).

- **Umbrella/Programmatic Plan:** This type of plan would be designed to be flexible and/or scalable. It would be more limited in scope in terms of covered activities and/or Permittees; however, there would be greater potential for plan approval given the more focused scope.

A regional multi-species HCP/NCCP approach can also differ in their conservation strategies. Conservation strategy elements can differ as outlined below.

- **Focused vs. Comprehensive Coverage:** Regional HCP/NCCPs can vary widely in terms of the range of Covered Species and Covered Activities addressed. A focused strategy is generally easier to develop but would not address all potential biological resources conflicts. A comprehensive strategy would take longer to develop but would prove greater overall coverage.
- **Conservation Strategy Approaches:** Generally, conservation strategies can be characterized as map-based, process/criteria-based, or hybrids. Map-based strategies often rely on “hard-lining” areas of development and areas of conservation. Process/criteria-based strategies are often referred to as “soft-line” plans and rely on criteria to describe how and what would be conserved through plan implementation. Hybrid strategies employ a mix of hard-line areas and soft-line areas.

As an alternative to the status quo or the regional multi-species HCP/NCCP approaches, several other conservation approaches could be employed, including

- Development of a permit-less conservation strategy
- Formalized use of mitigation banks
- Establishment of advanced mitigation programs
- Development of a Subarea Plan to the DRECP for the Desert Region
- Establishment of land owner partnerships; agreements

Each of these approaches should be evaluated as potential approaches when developing the conservation framework for San Bernardino County.

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

5 CONSERVATION PLANNING SUBAREAS

The San Bernardino County planning area spans a large geographic area covering approximately 12,862,900 acres. Conservation planning efforts at this scale often subdivide the planning area into smaller units referred to as “subareas” that can serve the following purposes:

- To focus elements of a conservation strategy (e.g., conservation objectives, conservation actions, etc.) on conservation targets (e.g., plant and wildlife species, natural communities) with greater geographic specificity within a planning area
- To align the planning effort with jurisdictional and/or administrative boundaries
- To structure and organize the analyses, mapping, and reporting

This section will (1) identify a set of potential approaches to subdividing the San Bernardino County planning area into subareas, (2) establish the criteria used to evaluate the utility of the identified subarea options, and (3) evaluate the potential subarea approaches to use for the Preservation/Conservation Framework.

5.1 Potential Subarea Approaches

The following potential approaches were used to subdivide San Bernardino County into smaller geographic units referred to as subareas.

- Biogeographic boundaries
 - Regions (*San Bernardino County General Plan*). Figure 5-1 depicts the planning area subdivided using Region Subareas.
 - Ecoregions (*US Forest Service ecoregion subsections*). Figure 5-2 depicts the planning area subdivided using Ecoregion Subareas.
- Hydrologic boundaries
 - Watershed boundaries (*California Department of Water Resources*). Figure 5-3 depicts the planning area subdivided using Watershed Subareas.
- Jurisdictional boundaries
 - Incorporated cities and unincorporated areas. Figure 5-4 depicts the planning area subdivided using Jurisdictional Subareas

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

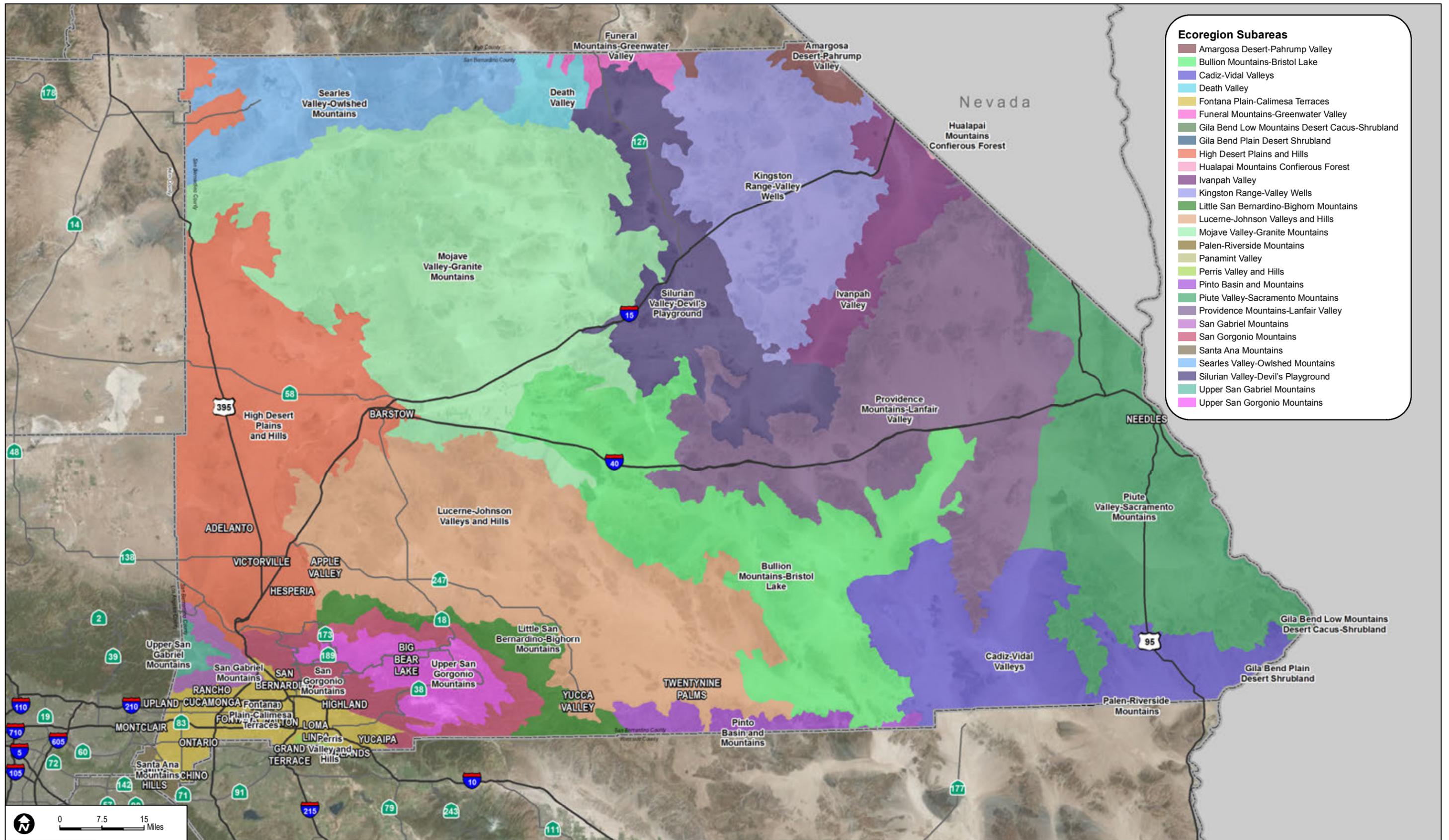
Combinations of these boundaries were also considered to subdivide the planning area into subareas. The following boundary combination approach was also used:

- Combined Biogeographic and Jurisdictional boundaries
 - Regions and Incorporated cities and unincorporated areas. Figure 5-5 depicts the planning area subdivided using Region-Jurisdictional Subareas.

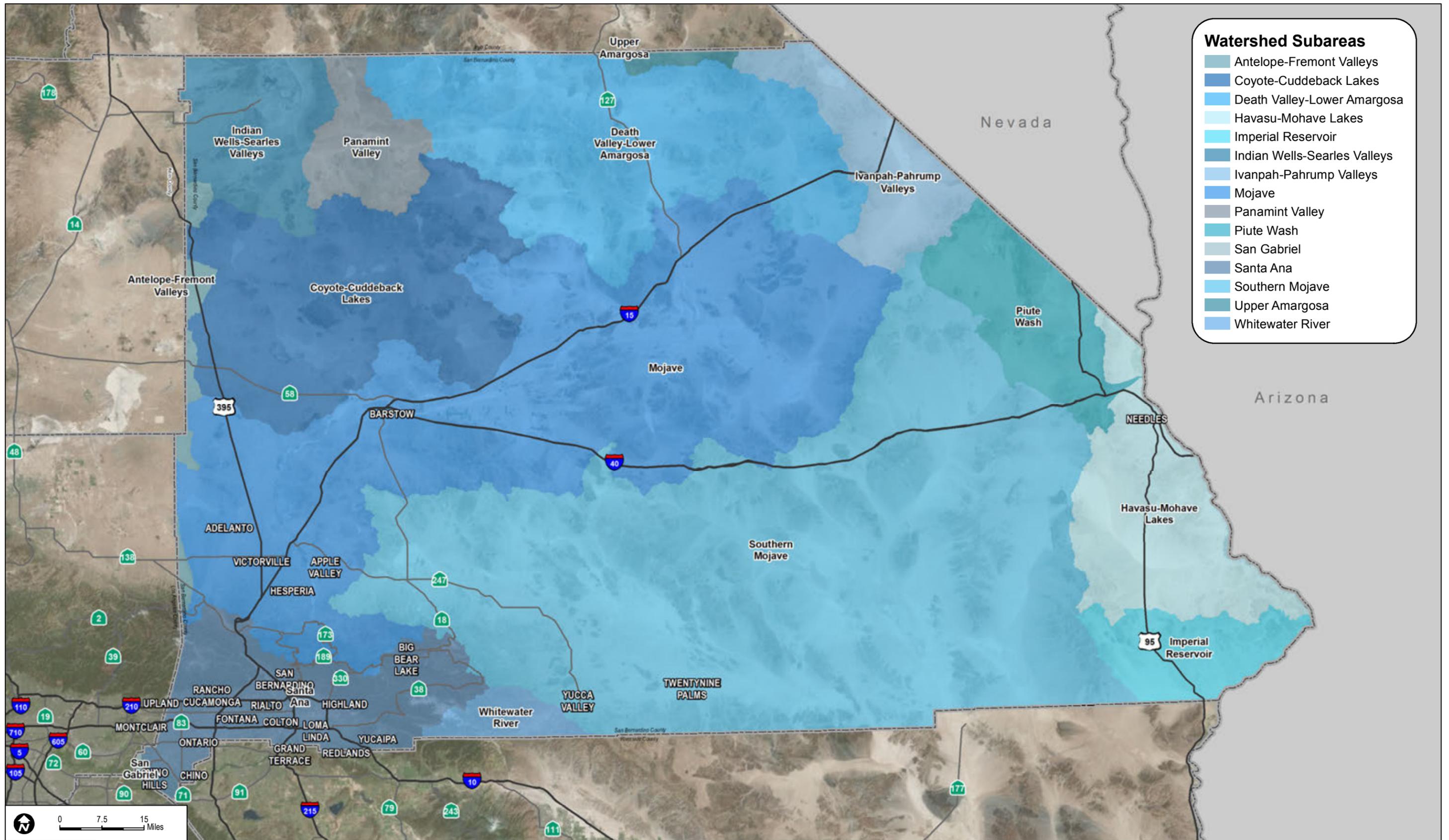
Potential approaches to subdivide the planning area that were considered but were not carried forward for evaluation included the following:

- Other Jurisdictional/Administrative boundaries: Other jurisdictional/administrative boundaries, such as BLM Land Use Plan areas, US Forest Service planning areas, USFWS field offices regions, and CDFG regions were all considered but were not carried forward for evaluation for this planning effort. The BLM Land Use Plan areas cover the eastern (desert) portion of the county and the US Forest Service planning areas cover the mountain portion of the county. These geographic areas do not cover the entire county planning area; therefore, these approaches were not carried forward. Administrative boundaries, such as the USFWS field office boundaries or the CDFW region boundaries, were also considered but not evaluated further. The USFWS field office (the Palm Springs sub-office area) and the CDFW region (the Inland Deserts region) that cover the county are both single geographic units and would not subdivide the planning area.
- Land Ownership: Although land ownership is useful information in the conservation planning process, ownership patterns are geographically “scattered” across the planning area and would not serve as functional subareas for planning.
- General Plan Land Use Designations: Although General Plan land use designations are also useful in the conservation planning process (e.g., for determining land status and uses), the geographic distribution of the land use designations clustered and dispersed across the planning area, which would not serve as functional subareas for planning.
- DRECP Subareas: The DRECP, as summarized in Section 4, uses ecoregion subareas (aggregations of the USFS ecoregion subsections) to subdivide the planning area, which includes the desert region of San Bernardino County. Because the DRECP does not cover the entire San Bernardino County, the DRECP subareas were not considered further. In considering the use of ecoregions as an approach to subareas for the Conservation Framework, the same aggregations of the USFS ecoregion subsections could be used to make the Conservation Framework subareas align with the DRECP ecoregion subareas, then aggregations in the mountain and valley regions would also need to be made for consistency.

INTENTIONALLY LEFT BLANK



INTENTIONALLY LEFT BLANK



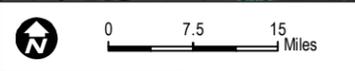
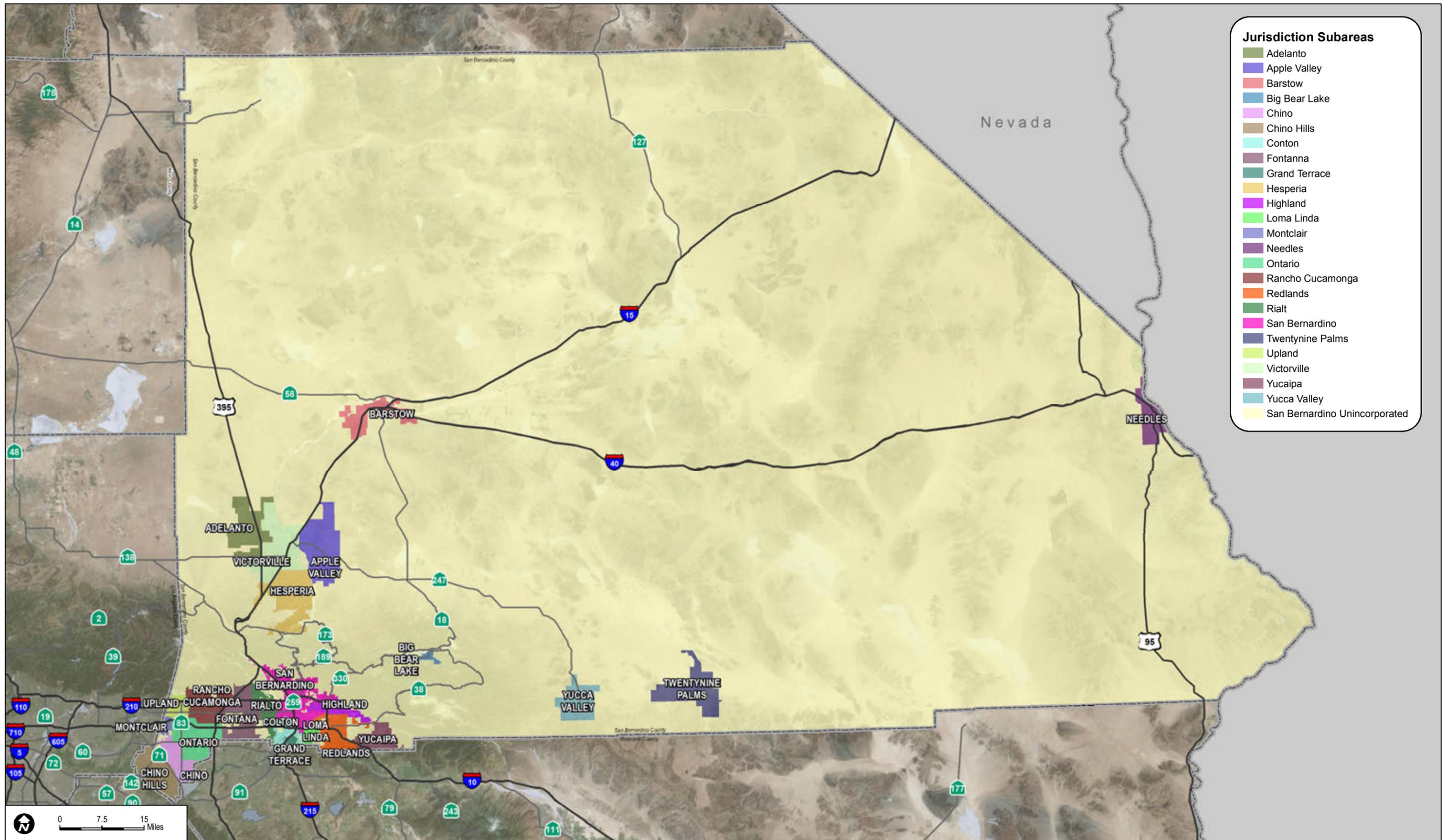
DUDEK

SOURCE: BING Maps 2014; USGS 2012

SANBAG Countywide Conservation Framework

FIGURE 5-3
Watershed Subareas

INTENTIONALLY LEFT BLANK



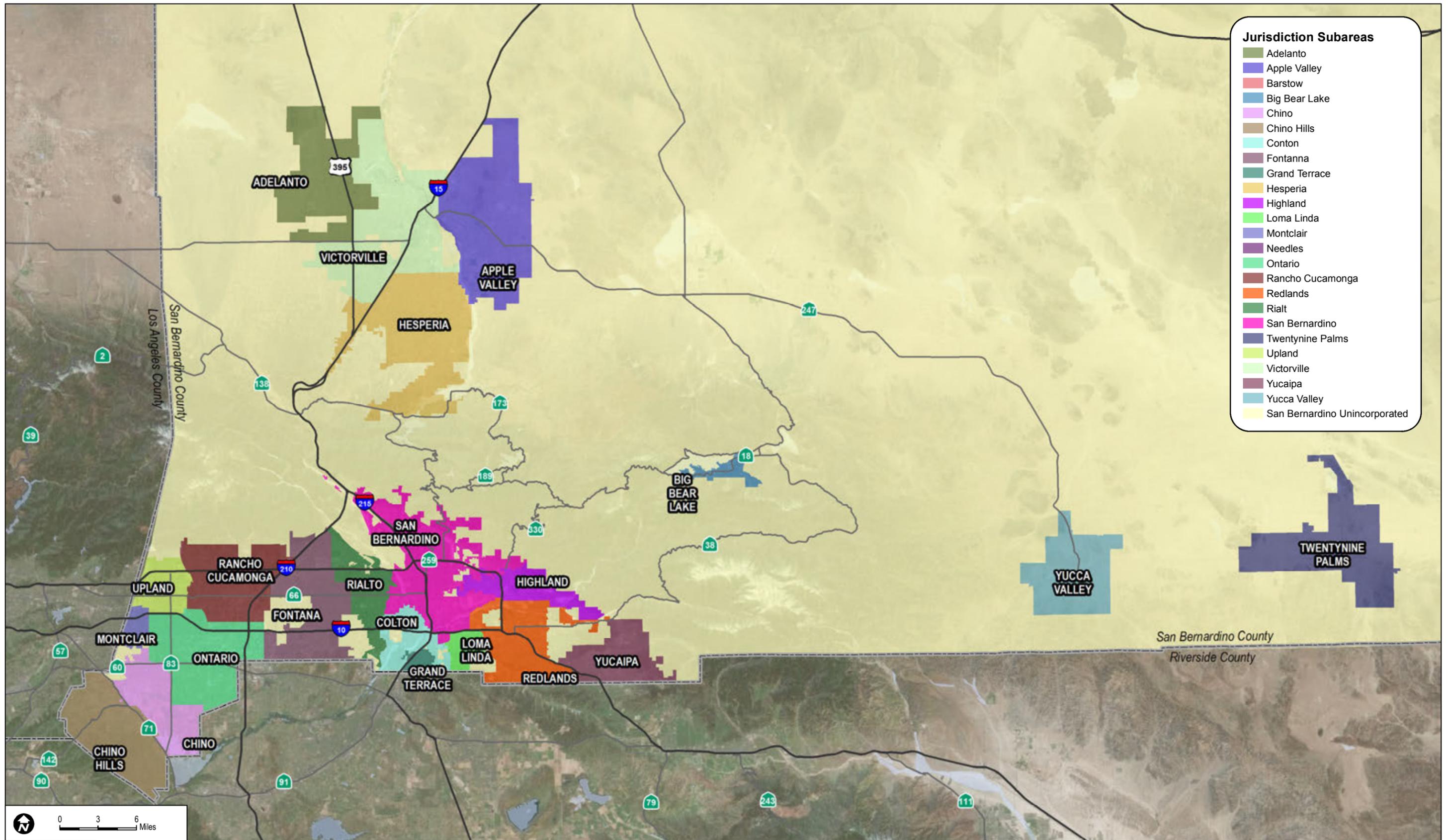
DUDEK

SOURCE: BING Maps 2014

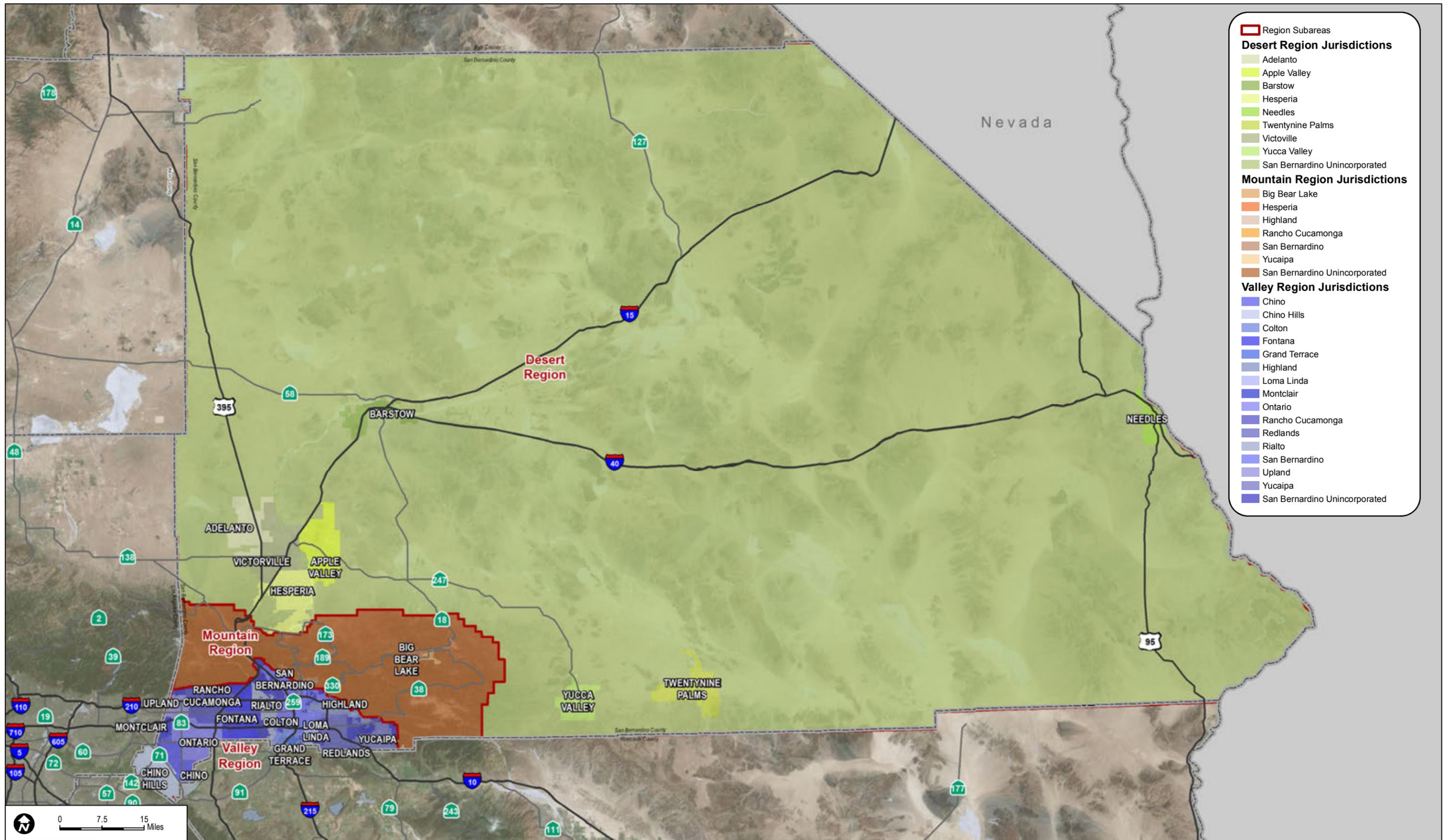
SANBAG Countywide Conservation Framework

FIGURE 5-4
Jurisdiction Subareas

INTENTIONALLY LEFT BLANK



INTENTIONALLY LEFT BLANK



DUDEK

SOURCE: BING Maps 2014

SANBAG Countywide Conservation Framework

FIGURE 5-5
Region-Jurisdiction Subareas

INTENTIONALLY LEFT BLANK

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- **Jepson Ecoregions:** The ecoregions used in the Jepson Manual of Higher Plants of California provide geographic subdivisions of California and classify the California Floristic Province into regions and subregions. These ecoregions are very similar geographically as the USFS ecoregion subsections; therefore, Jepson ecoregions were not considered further.
- **Other Combinations:** Four sources of subarea boundaries (i.e., Regions, Ecoregions, Watersheds, and Jurisdictions) were used to create five potential subarea approaches (i.e., one for each source boundary and one combination approach using Region with Jurisdiction). Other combinations of these boundaries were considered but were not carried forward for evaluation. Regions, Ecoregions, and Watersheds are biogeographic/hydrologic based boundaries which would not function as combinations of with each other. Combining jurisdiction with ecoregions or watershed would yield a high number of subareas and would be overly complex.

5.2 Criteria for Evaluating the Subarea Approaches

The potential subarea approaches for the Conservation Framework were evaluated using the following primary criteria:

1. **Usefulness:** Subarea boundaries should be useful in serving the purposes noted above such as helping to define conservation targets and to focus conservation strategies within geographic areas. Subarea boundaries that delineate real distinctions in ecoregions, natural communities, and Covered Species ranges are often useful to help serve the purposes noted above since, for example, it is sometimes useful to establish conservation targets for ecoregion or natural community groupings with similar characteristics or that support life history requirements for certain groups of species.
2. **Practicality:** Subarea boundaries should be practical for implementation and for providing structure/organization. Subareas based on administrative and jurisdictional boundaries make it clear how a conservation strategy would be implemented in each geographic unit. Physical features such as ridgelines or watershed boundaries sometimes define certain administrative or biological boundaries, which can often be located on the ground and can assist in conservation strategy implementation. The number of subareas in relationship to the size of the overall plan area may also relate to practicality for implementation for a variety of reasons; too many subareas can defeat the structural/organizational purpose of subareas.

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

5.3 Evaluation of the Potential Subarea Approaches

Figures 5-1 through 5-5 illustrate the five potential subarea approaches evaluated for the Conservation Framework. The following evaluation summarizes these potential approaches and briefly describes the advantages and disadvantages of each option.

5.3.1 Region Subareas

Figure 5-1 shows the Region subareas for the planning area. There are three regions in the planning area: desert, mountain, and valley. Region subareas are based on the structural/organizational units used in the San Bernardino General Plan (County of San Bernardino 2007). These broad units are based on biogeographic landscape features that are analogous to coarse-scale ecoregions. Table 5-1 summarizes the regions subareas for the planning area.

**Table 5-1
Region Subareas Approach Summary**

Region	Total (acres)
Desert Region	11,986,196
Mountain Region	561,753
Valley Region	314,915
Total	12,862,864

From a planning perspective, Region subareas are logical units, manageable in terms of number of units, and consistent with other regional planning documents. Region subareas also have biogeographic relevance and are characterized by similar climates, physical features, natural communities, and special-status species. A disadvantage of the Regions subareas is the large (nearly 12 million acres) and unsubdivided desert region. Hybrid approaches that employ ecoregions in the desert region could overcome this shortcoming.

5.3.2 Ecoregion Subareas

Figure 5-2 shows the Ecoregion subareas for the planning area. There are 28 ecoregions or portions of ecoregions in the planning area, as shown in Table 5-2. Ecoregion subareas are based on the US Forest Service ecoregion subsection data (USFS 1997).

From a planning perspective, Ecoregion subareas are biogeographically relevant and reflect climatic, physical, and biological differences across the landscape. Disadvantages to this subarea approach are that the number of geographic units are high and there are several ecoregions with

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

very little acreage in the planning area. Consolidation of the USFS ecoregion subsections (i.e., aggregating subsections and slivers of subsections into single geographic units) into subareas specifically developed for the Conservation Framework would overcome the disadvantages of ecoregions as a subarea approach.

**Table 5-2
Ecoregion Subareas Approach Summary**

Ecoregion	Total (acres)
Amargosa Desert-Pahrump Valley	64,549
Bullion Mountains-Bristol Lake	1,185,886
Cadiz-Vidal Valleys	794,478
Death Valley	95,778
Fontana Plain-Calimesa Terraces	267,001
Funeral Mountains-Greenwater Valley	52,516
Gila Bend Low Mountains Desert Cactus-Shrubland	63
Gila Bend Plain Desert Shrubland	342
High Desert Plains and Hills	1,217,299
Hualapai Mountains Coniferous Forest	1,122
Ivanpah Valley	296,597
Kingston Range-Valley Wells	853,420
Little San Bernardino-Bighorn Mountains	192,374
Lucerne-Johnson Valleys and Hills	1,467,840
Mojave Valley-Granite Mountains	1,962,329
Palen-Riverside Mountains	579
Panamint Valley	454
Perris Valley and Hills	6,659
Pinto Basin and Mountains	114,512
Piute Valley-Sacramento Mountains	1,090,793
Providence Mountains-Lanfair Valley	1,429,830
San Gabriel Mountains	63,480
San Gorgonio Mountains	251,140
Santa Ana Mountains	26,446
Searles Valley-Owlshead Mountains	508,758
Silurian Valley-Devil's Playground	661,122
Upper San Gabriel Mountains	26,755
Upper San Gorgonio Mountains	230,741
Total	12,862,864

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

5.3.3 Watershed Subareas

Figure 5-3 shows the Watershed subareas for the planning area. There are 15 watersheds or portions of watersheds in the planning area, as shown in Table 5-2. Watershed subareas are based on the California Department of Water Resources hydrologic unit data (DWR 2004).

From a planning perspective, Watershed subareas capture elements of hydrologic processes and connectivity; however, these geographic units are vast and fail to capture major physical and biological features (e.g., half of the Mountain region drains west towards the coast and the other half drains to the central Mojave Desert).

**Table 5-3
Watershed Subareas Approach Summary**

Watershed	Total (acres)
Antelope-Fremont Valleys	87,856
Coyote-Cuddeback Lakes	1,177,161
Death Valley-Lower Amargosa	1,351,164
Havasu-Mohave Lakes	645,244
Imperial Reservoir	301,852
Indian Wells-Searles Valleys	420,218
Ivanpah-Pahrump Valleys	387,185
Mojave	2,944,792
Panamint Valley	253,924
Piute Wash	441,732
San Gabriel	7,457
Santa Ana	643,370
Southern Mojave	4,053,836
Upper Amargosa	36,023
Whitewater River	111,051
Total	12,862,864

Source: California Department of Water Resources (DWR) California watersheds dataset

5.3.4 Jurisdictional Subareas

Figure 5-4 shows the Jurisdictions subareas for the planning area. There are 25 jurisdictional units in the planning area, including 24 incorporated cities plus the unincorporated county. Jurisdiction subareas are based on the city boundaries for all incorporated cities and the remainder of the unincorporated land in the County planning area (County jurisdiction). Table 5-4 summarizes the Jurisdictions subareas for the planning area. Use of city boundaries would provide relatively small coverage of the planning area with the large “remainder” area (over 12 million acres) comprised of unincorporated County lands.

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

Jurisdictional boundaries provide advantages in terms of conservation strategy implementation, but jurisdictions lack any foundation in biogeography and therefore are not useful units framing the conservation strategy. Calculations, analysis, and reporting by jurisdiction would be used regardless of the subarea boundary approach ultimately selected.

**Table 5-4
Jurisdiction Subarea Approach Summary**

Jurisdiction	Total (acres)
Adelanto	33,793
Apple Valley	47,146
Barstow	26,292
Big Bear Lake	4,112
Chino	18,949
Chino Hills	28,700
Colton	10,327
Fontana	27,114
Grand Terrace	2,259
Hesperia	46,499
Highland	11,957
Loma Linda	4,821
Montclair	3,545
Needles	19,856
Ontario	31,938
Rancho Cucamonga	25,673
Redlands	23,192
Rialto	14,299
San Bernardino	39,971
San Bernardino County Unincorporated	12,304,201
Twentynine Palms	37,634
Upland	10,025
Victorville	47,318
Yucaipa	17,758
Yucca Valley	25,486
Grand Total	12,862,864

5.3.5 Region-Jurisdiction Subareas

Figure 5-5 shows the Region-Jurisdiction subareas for the planning area. This combination approach uses the Regions described in Section 5.3.1 and the Jurisdictions described in 5.3.4 to create subareas that combine the advantages of each approach (e.g., biogeographic basis of the

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

Regions combined with the implementation advantages of the Jurisdictions). Table 5-5 summarizes the Region-Jurisdiction subareas for the planning area. This approach does not overcome the vast acreage of unincorporated County land in the desert. Additionally, some jurisdictions span multiple regions. Modifying boundaries so that jurisdictions are not split up by regions would overcome a shortcoming of this approach.

**Table 5-5
Region-Jurisdiction Subarea Approach Summary**

Jurisdiction	Desert Region	Mountain Region	Valley Region	Total (acres)
	Region			
Adelanto	33,793	--	--	33,793
Apple Valley	47,146	--	--	47,146
Barstow	26,292	--	--	26,292
Big Bear Lake	--	4,112	--	4,112
Chino	--	--	18,949	18,949
Chino Hills	--	--	28,700	28,700
Colton	--	--	10,327	10,327
Fontana	--	--	27,114	27,114
Grand Terrace	--	--	2,259	2,259
Hesperia	46,421	78	--	46,499
Highland	--	213	11,744	11,957
Loma Linda	--	--	4,821	4,821
Montclair	--	--	3,545	3,545
Needles	19,856	--	--	19,856
Ontario	--	--	31,938	31,938
Rancho Cucamonga	--	14	25,660	25,673
Redlands	--	--	23,192	23,192
Rialto	--	--	14,299	14,299
San Bernardino	--	3,900	36,071	39,971
San Bernardino County Unincorporated	11,702,252	552,853	49,097	12,304,201
Twentynine Palms	37,634	--	--	37,634
Upland	--	--	10,025	10,025
Victorville	47,318	--	--	47,318
Yucaipa	--	583	17,175	17,758
Yucca Valley	25,486	--	--	25,486
Total	11,986,196	561,753	314,915	12,862,864

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

5.4 Subarea Approach for the Conservation Framework

Based on the evaluation of the five potential Subarea approaches summarized in Section 5.3, the preliminary recommendation for subareas to use in the Conservation Framework are the Region Subareas (Figure 5-1). The rationale behind the preliminary recommendation provided here includes:

- Regions are logical geographic units that demarcate landscape-level biogeographic and physical zones.
- Regions were used as structural/organizational units in the San Bernardino General Plan
- Regions generally align with coarse-level land ownership and use patterns.
- Regions have a manageable number of geographic units

Hybrid versions of the Region Subareas may also be developed that may be preferred over using the Regions boundaries only (e.g., the Regions-Jurisdictions version analyzed here or subdividing the desert region into smaller units).

San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development

INTENTIONALLY LEFT BLANK

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

6 PRINCIPLES AND RECOMMENDATIONS

The following draft principles and recommendations have been developed for the San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework. These principles and recommendations have been developed in collaboration with and have been reviewed by the Planning Directors Technical Forum (PDTF) as well as the County's Environment Element Group (EE Group). The Principles are intended to provide broad guidance or recommendations related to future conservation planning in the County. These Principles would be used to guide development of subsequent phases of the Conservation Framework. The Principles are grouped into Policy Principles and Biological Principles. The Principles are presented in a summary list, followed by further discussion of each below.

Policy Principles

- Principle 1: Increase certainty while maintaining flexibility in compliance approach for both the preservation/conservation of habitat as well as for land development and infrastructure permitting.
- Principle 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 while also respecting private property rights.
- Principle 3: Design institutional structures to promote habitat protection and management to leverage private funding, easements, public funding, and other mechanisms to maximize the protection of habitat and associated species, while respecting private property rights.
- Principle 4: Conservation planning efforts should be led by a funded institutional structure with authority and accountability that can provide champions to keep the process moving in a transparent, productive and timely manner.
- Principle 5: Recognize that jurisdictional and other stakeholder participation 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.
- Principle 6: Leverage existing conservation efforts.
- Principle 7: Match potential tools for conservation with unique conservation and development needs within specific subareas.
- Principle 8: Consider conservation planning strategies that go outside the Jurisdiction and County boundaries, if needed, while respecting the primacy of local control.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- Principle 9: Achieve conservation objectives in San Bernardino County through a variety of conservation strategies.

Biological Principles

- Principle 10: Recognize San Bernardino County is biologically diverse.
- Principle 11: Invest in the science of conservation planning.
- Principle 12: The identification of conservation areas should incorporate scientifically-accepted tenets of conservation biology.
- Principle 13: Consider current and future endangered, threatened, and sensitive species. Also, consider common species as indicators to track population trends.
- Principle 14: Identify mechanisms for long term, sustainable, adaptive management and monitoring.
- Principle 15: Manage public access to be compatible with conservation needs.

6.1 Policy Principles

Principle 1 Increase certainty while maintaining flexibility for both the preservation/conservation of habitat as well as for land development and infrastructure permitting.

One of the biggest risks with development of private or public projects is uncertainty. Management of certainty is important to keep projects moving forward. However, conservation concerns have sometimes stymied development efforts in San Bernardino County or have required project modifications that have been greater than project proponents may have expected. Understanding and planning for habitat conservation in a comprehensive and proactive manner will help create certainty in the development process for proposed land development and infrastructure projects. A Countywide Habitat Preservation/Conservation Framework that increases certainty would allow both the conservation community and development community to manage their respective expectations regarding habitat conservation objectives and mitigation obligations. It should also be understood that region wide planning efforts may not always apply effectively across all jurisdictional boundaries. To this end, the primacy of local land use control should be paramount.

To meet both conservation and development interests, there should be a clearer process and better understanding of regulatory permitting processes (i.e., Waters of the U.S. and State, Porter Cologne Act and Endangered Species). Communication and coordination among the local, state and federal

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

jurisdictions and agencies will be important at the outset of conservation planning efforts so that expectations can be realized and managed for future processes. Creative ways to achieve the regulatory requirements while allowing for flexibility and pragmatic solutions should be sought out. Additionally, flexibility and incentive-based opportunities should be included to assist in making needed development and planning efforts as efficient and cost-effective as possible.

Principle 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.

Economic growth is a necessity for the sustainability of communities. Policies at the local jurisdiction, regional, and State levels will influence how robust that economic growth can be. Initiatives to improve the overall economic performance of the region and achieve a growing economy are addressed by the Countywide Vision Jobs/Economy element. However, conservation objectives and regulatory realities related to species occurrence, sensitive habitats, and protected areas need to be recognized and accommodated for that growth to be achieved. Growth and conservation are linked, and conservation planning tools can provide the mechanisms to balance the linked interests of both growth and conservation. In turn, successful conservation efforts depend on a vibrant economy to provide the funding capacity for establishment and management of the conserved lands. To facilitate needed economic fuel for the county, a broad toolkit of compliance and mitigation approaches should be considered including consideration of new ideas and mitigation approaches proposed by all stakeholders.

Principle 3 Design institutional structures to promote habitat protection and management to leverage private funding, easements, public funding, and other mechanisms to maximize the protection of habitat and associated species, while respecting private property rights.

Habitat protection and management can be achieved through a variety of mechanisms. Existing habitat protection and management occurs in many jurisdictions and entities throughout the County, and these existing conservation areas can serve as building blocks around which future conservation areas are established. Additionally, certain jurisdictions have large land developers that may set aside lands for conservation, which should be incorporated into the network of habitat conservation within the County. Incentives to encourage land dedications should be considered to help facilitate these potential opportunities. If private property is used for conservation, it would occur as a voluntary agreement with the property owner and the property owner would be fairly compensated. Public funding sources such as grants from the US Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) should also

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

be sought to help with land acquisitions for conservation. Cooperating entities such as Crafton Hills Conservancy, Riverside Land Conservancy (RLC), Redlands Conservancy and the Inland Empire Resource Conservation District (IERCD) and others should be coordinated with and approached to cooperatively contribute to land acquisition and potentially, management. County Special Districts and Local Agency Formation Commission (LAFCO) should also be sought out for land management, land acquisition and funding strategies for conservation areas. Coordinating the available resources can lead to better management and more cost-effective use of the available funding.

Principle 4 Conservation planning efforts should be led by a funded institutional structure with authority and accountability that can provide champions to keep the process moving in a transparent, productive and timely manner.

Successful planning comes from cooperation and compromise of the people involved. Successful conservation planning programs have had “champions”. The people at the conservation planning table matter, and should have a universal understanding of the conservation and development goals and be able to work toward compromise. Working with the Wildlife Agencies is required for species and habitat permitting, and creative and flexible methods of getting the work done needs to be considered and implemented, such as:

- Identify entities that have funding available or can obtain and manage funding for conservation planning. These entities should employ personnel that are knowledgeable in conservation biology and/or land management.
- Create a steering committee or other mechanism for community stakeholders to have input in decisions and direction of efforts.
- Provide funding to pay for additional Wildlife Agency staff dedicated to the conservation planning efforts.
- Look for public/private partnership opportunities. Bringing together public resources with private flexibility could benefit conservation.

Principle 5 Recognize that jurisdictional and other stakeholder participation 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.

If future comprehensive efforts for conservation planning are to take place, then cooperation amongst those with interest in conservation planning is required. All the stakeholders/entities involved must understand that comprehensive conservation planning is typically an exercise in

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

compromise. Future conservation efforts must seek a balance between development and conservation interests. Voluntary participation by local jurisdictions and special districts is key and would be expected because land use authorities and other entities have their own discrete responsibilities/oversights. Economic incentives can be explored that would facilitate voluntary landowner participation. It would be accepted that private property owners would be fairly compensated for lands used as conservation. Through comprehensive planning, participants can obtain streamlined compliance and time and cost savings for both public infrastructure and private development. Participation in a comprehensive conservation planning effort will not always result in all parties being completely satisfied with the outcome, but rather in overall long-term benefits over the status quo.

Principle 6 Leverage existing conservation efforts.

Future conservation efforts should not “recreate the wheel”. Using existing conservation areas, or open space areas as the foundation for which future conservation lands are sought should be the priority. Conservation efforts should incorporate and coordinate existing federal land management areas, plans, and strategies (e.g., U.S. Forest Service [USFS] and Bureau of Land Management [BLM] management plans) into new conservation areas to maintain connected and consistent management actions among adjacent lands. Essentially, looking for ways to “fill in” the gaps of existing conservation with proposed conservation should be a focus of the Countywide Habitat Preservation/Conservation Framework. Habitat conservation planning is typically focused on Endangered Species Act (ESA) and California Endangered Species Act (CESA) compliance; however, many projects and jurisdictions also need to comply with “waters” regulations such as the Clean Water Act (regulated by the Army Corps of Engineers) and Streambed Alteration Agreement (regulated by the California Department of Fish and Wildlife). Conservation planning efforts should take into consideration the need for projects to provide mitigation for compliance with “waters” regulations in addition to ESA permitting needs. By considering the “waters” mitigation needs with the ESA conservation planning, local jurisdictions are able to consolidate the amount of lands required for mitigation, thereby minimizing duplication of mitigation requirements for waters and ESA permitting.

Principle 7 Match potential tools for conservation with unique conservation and development needs within specific subareas.

In a planning area the size of San Bernardino County, conservation and development needs can be geographically diverse. Subdividing the County into useful and practical subareas can help focus the conservation strategies and tools to specific geographic regions. For instance, a majority of the land base in the desert and mountain regions of San Bernardino County is administered by federal entities (e.g., Department of Defense [DoD], National Park Service

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

[NPS], BLM, and USFS). In these regions, a comprehensive habitat conservation strategy would complement and build upon the conservation initiatives and programs of these federal entities. In the Valley and mountain foothills, land is predominantly privately held and the development potential is generally higher; therefore, the conservation strategy and tools employed should be tailored to this subarea of the County.

Principle 8 Consider conservation planning strategies that go outside jurisdiction and the County boundaries, if needed.

Areas supporting key biological resources and ecological processes occur throughout the County and also extend outside of the County into adjacent counties, or into cities or towns. Building upon existing protected lands in adjacent jurisdictions and counties (e.g., Western Riverside County Multiple Species Habitat Conservation Plan conserved lands) can benefit the biological resources in both jurisdictions and counties. Conservation strategies that have worked in surrounding jurisdictions and counties should be considered as a conservation tool. Local control should be an important consideration while planning across jurisdictional boundaries. Planning for habitat conservation that considers adjacent and surrounding resources and planning efforts will ensure development of comprehensive and robust conservation strategies for San Bernardino County.

Principle 9 Achieve conservation objectives in San Bernardino County through a variety of conservation strategies.

Open space and biological resource conservation currently occurs through a variety of mechanisms on both private and public lands in the County. The Countywide Habitat Preservation/Conservation Framework should aim to organize and coordinate these existing conservation efforts. Additionally, the framework should develop a conservation strategy structure that employs a variety of conservation tools or options for achieving the conservation needs. Proposed conservation strategies could incorporate economic impact analysis. The conservation strategy structure should incorporate a combination of the following potential conservation tools:

- Leveraging existing, ongoing conservation efforts
 - Conservation activities conducted by Resource Conservation Districts, County Special Districts, and other conservation land management organizations
 - Existing and proposed HCPs
 - Creative coordination with state and federal agencies (e.g., CDFW, BLM, USFS, NPS, DoD)

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- Potential tools for conservation
 - Mitigation banking
 - Density and development transfers
 - Land and easement acquisition
 - Avoidance and set asides from development
 - Regional HCP/NCCPs
 - In Lieu Fee Programs
 - Voluntary conservation and conservation credits
 - Public financing for purchases of private property
 - General Plan Policy implementation
 - Hillside Ordinance implementation
 - Permit-less conservation strategy
 - Advanced mitigation programs
 - Subarea Plan to the DRECP in the Desert Region
 - Land Owner partnerships; agreements

6.2 Biological Principles

Principle 10 Recognize San Bernardino County is biologically diverse.

San Bernardino County covers over 12 million acres and several distinct ecoregions supporting an incredibly diverse assemblage of plant and wildlife species and natural communities. A Countywide Habitat Preservation/Conservation Framework developed to address such a biologically diverse area should include multi-faceted conservation strategy elements to address biological resources across the county. Establishing planning subareas (as discussed in Section 5) can facilitate conservation planning across such a biologically diverse County by focusing conservation strategies geographically.

Principle 11 Invest in the science of conservation planning.

For conservation planning to be successful, the planning process should be informed by the best available, peer-reviewed scientific information. Conservation planning should follow a systematic process that incorporates the best available information into an approach that is scientifically defensible, repeatable, and transparent (Margules and Pressey 2000). This process

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

should incorporate a commitment to acquiring up-to-date science in an ongoing manner. Through a systematic process, conservation planning decisions can be data-driven and biologically justified. Recommended components of a systematic conservation planning approach for the Countywide Habitat Preservation/Conservation Framework include, but are not limited to, the following:

- Identifying the conservation targets (e.g., focal species and natural communities)
- Describing the biological baseline conditions for the conservation targets
- Developing biological goals and objectives for the conservation targets
- Identifying conservation actions and measures
- Identifying mechanisms and tools to achieve conservation target objectives
- Developing management goals, strategies, and mechanisms
- Ranking and prioritizing resources and actions

Principle 12 The identification of conservation areas should incorporate scientifically-accepted tenets of conservation biology.

Identifying areas for preservation/conservation should incorporate scientifically-accepted tenets of conservation biology together with the best available biological data for the planning area. Creative approaches to conservation planning should be considered. The following tenets should be used to guide the identification of conservation areas:

- **Larger conservation areas are better:** Conservation areas that are larger have a greater potential to support self-sustaining populations of focal species. Larger conservation areas are more resilient to disturbance and have a greater “interior” area relative to “edge” area; therefore, are less susceptible to adverse edge effects. As a guiding tenet for identifying conservation areas, establishing new conservation adjacent to existing conservation areas is generally preferred over establishing isolated new conservation areas.
- **Focus on ecological integrity and biological diversity:** Conservation areas that reflect the full ecological diversity and heterogeneity of natural communities maintain habitat diversity for a full range of species, including common species as well as listed and sensitive species. Conservation areas that capture ecological and physical processes across the landscape will maintain the ecological integrity that supports the diversity of species and natural communities.
- **Maintain connectivity:** Conservation areas that are connected reduce the adverse effects of habitat fragmentation on ecosystem function and species demography. As much as

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

possible, conservation areas should protect habitat linkages, landscape features (e.g., canyons, ridgelines, hillslopes), riparian corridors, climate change refugia, and environmental gradients to maintain and support the ability of species to move, exchange genetic material, migrate, disperse, and colonize. Conservation efforts should be coordinated with state and federal agencies to maintain habitat linkages from state and federal lands to other lands.

- **Minimize edge effects and urban interface:** Conservation areas that are buffered from adjacent urban development have fewer adverse direct and indirect effects associated with urban areas.
- **Target high quality habitats:** Identifying and prioritizing high quality habitats for inclusion in conservation areas will ensure the best areas for supporting biological resources are captured. These areas would likely be characterized by the highest intactness and least habitat fragmentation and edge effects; therefore, these areas would have the highest potential to maintain their ecological function and fewest habitat management issues over the long term.
- **Protect irreplaceable or threatened biological resources:** Certain resources on the landscape are truly unique and cannot be replaced in other locations. These irreplaceable or threatened resources should be considered for prioritization for inclusion in conservation areas.
- **Capture environmental gradients:** Conservation areas that include the full range of contiguous environmental gradients (i.e., topography, elevation, substrates) are more likely to allow for shifting, expanding, or contracting species distributions in response to environmental change or disturbance (e.g., climate change, fire, flood).

Principle 13 Consider current and future endangered, threatened, and sensitive species. Also, consider common species as indicators to track population trends.

State and/or federal regulations apply to species listed as threatened or endangered as well as species considered rare, sensitive, or of special concern by state and federal agencies. Conservation planning efforts should focus on both current and future environmental and economic conditions to find a balance between conservation and development needs. Species that have current listing status under the ESA and CESA should be considered, as well as any rare, sensitive, or special status species. Analysis of species that have the potential to be listed or designated as sensitive or of concern in the future should also be considered in conservation planning. Also, monitoring populations of common species are useful indicators of ecological health. Future planning should incorporate species and habitat analyses that consider risks such as climate change, urban edge effects, and future development patterns.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

Principle 14 Identify mechanisms for long term, sustainable, adaptive management and monitoring.

Existing conservation lands are being managed and held by various entities. As future conservation efforts are made, a systematic and sustainable plan should be established to ensure that the conservation areas are protected and managed to maintain and enhance ecological function and value over the long term. Recognize that conservation lands may require restoration and/or ongoing management activities to continue to support conservation targets in the long-term. Incorporate an adaptive management approach that uses effectiveness monitoring to inform the identification of the management actions that are adapted over time to maintain and enhance ecological function. Funding analysis should occur early and often to ensure costs are being captured and the financial sustainability of the lands are ensured. Collaborate with current or future authorized public and private entities managing lands in the County, such as the Inland Empire Resource Conservation District (IERCD), Redlands Conservancy, Crafton Hills Conservancy, and Riverside Land Conservancy (RLC).

Principle 15 Manage public access to be compatible with conservation needs.

Open space areas are “green” amenities within the communities of San Bernardino County and are used for a variety of public uses. In order for the existing and future conservation areas to continue to function to support species and natural communities, public access in conservation areas should be managed so it is compatible with conservation needs. Sufficient funding must be available to ensure that conservation areas are effectively managed for compatible public access.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

7 NEXT STEPS

To develop a countywide conservation plan as outlined in this conservation framework study , there needs to be a collaboration amongst the stakeholders and a willingness of all parties to seek the most benefit for those involved. The vision of the conservation framework is embodied in Principle 1, which is to provide certainty to the development and conservation processes in the county. The intent would be to approach habitat preservation/conservation in a more comprehensive manner such that the environment benefits from more cohesive, functional habitats that will protect species, while providing economic development benefits through greater clarity and speed in the development process. This is consistent with the lead paragraph in the Environment Element of the Countywide Vision, which states, in part:

“We shall strive to intelligently manage our resources for habitat preservation, recreation opportunities, resource extraction, alternative energy, future growth, water quality, and air quality all within a regulatory framework that does not impede the creation of a sustainable economy.”

The intent of this section is to provide a pathway of the next steps that need to be taken, based on what has been completed to date by the efforts outlined in this report. This effort has not been exhaustive, nor was it intended to be; rather it is the first of multiple steps needed to implement a conservation plan for the county.

The following includes a discussion of the next steps and commitments necessary to continue the momentum proceeding to the next level or phases of a more comprehensive, countywide conservation strategy. A discussion of the next steps on a countywide and subarea level is provided where applicable. The entity responsible, the proposed implementation schedule, personnel, and financial resources needed for each of the next steps are also identified, where applicable.

Primary Priorities: Timeframe: 6 months

1. Identify an Interim Lead for Conservation Planning.

Moving forward from a framework study to a comprehensive planning phase, one entity should be identified to keep the initiative moving and be accountable for achieving progress. As stated in Principle 4, a “champion” or Lead for conservation planning in the county should be established. Since this next step is the first of many, and the course of action and players may change once more information is compiled, the Lead that is identified initially may not be the same Lead throughout the whole process. For this reason, an Interim Lead should be chosen until a long-term Lead entity is identified.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

The process for choosing an Interim Lead could be undertaken by a small committee of individuals that can provide the collaboration and leadership needed to sustain the momentum for this conservation framework. Potential Interim Leads could be the Local Agency Formation Commission (LAFCO), County of San Bernardino, or SANBAG. LAFCO and SANBAG could be potential interim leaders for conservation planning efforts, given their innate role as the representative for all the local jurisdictions in the county. The County of San Bernardino could also be the Interim Lead since they oversee the Countywide Vision program.

The Interim Lead could employ individuals with conservation planning backgrounds to facilitate the management of the conservation planning efforts on behalf of the local jurisdictions. The Interim Lead should have good working relationships with the regulatory agencies, and be able to facilitate and foster those relationships which would be important in developing the conservation plan.

The Interim Lead should work with a consortium (or steering committee) of jurisdictions and entities that would focus on conservation planning in the county. The consortium could include representatives of jurisdictions from each region and entities already involved in either land acquisition and/or management in the county such as Inland Empire Resource Conservation District (IERCD), Riverside Land Conservancy (RLC), Center for Natural Lands Management (CNLM), and County Special Districts. Because the Valley Region has the most focus for development, representatives from multiple cities for this region should be involved. Coordination with landowners should be encouraged. Other considerations could include personnel from other Habitat Conservation Plans, such as San Bernardino Valley Water Conservation District and/or San Bernardino Valley Municipal Water District, inclusion of a qualified biologist, and personnel knowledgeable in GIS.

2. *Create an Inventory and Tracking System.*

The Interim Lead entity, or a designee (e.g., management agency, academic institution), would create an inventory of conservation lands in the county and establish a system for long-term tracking of new conservation acquisitions. The Interim Lead entity or designee managing the inventory and tracking system will be trusted with maintaining data quality and accuracy, and appropriate confidentiality. The inventory presented as part of this report (Section 2) would serve as a starting point, and obtaining missing data identified in Section 3 should be a priority. A digital format inventory integrated with GIS should be required, as this is easily shared with other entities. The tracking and inventory system should be established in an acceptable, uniform format for ease of use by multiple jurisdictions and integration into a single tracking system. Once the inventory of

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

previous, existing conservation ownership is complete, a long-term tracking/collection system needs to be established to document new conservation lands set asides and/or acquisitions that occur through the development process as a result of hillside ordinance compliance, or land set asides required by the local jurisdiction, or from the regulatory permitting process for waters (i.e., 1600 Permits, 404 permits). The inventory and tracking system should include and distinguish among lands legally committed to conservation through signed and executed easements or other similar agreements as well as proposed conservation lands not yet legally transferred into conservation. Tracking existing and new conservation efforts is imperative to developing and maintaining a cohesive conservation plan. The tracking system could be linked to the development entitlement process so that all applicants are required to report their digital footprint of conservation and the permitting local agency could provide an annual report of their conservation efforts to the Interim Lead/Lead entity. The reporting requirements could also apply to the consortium of participants (mentioned above) responsible for management of conservation lands. Demonstrating the ability to track and manage connected conservation lands would provide the regulatory agencies with assurances that conservation lands function as intended for mitigation for impacts and may result in more streamlined processing for projects.

3. Identify Funding Sources.

As stated in Principle 3, multiple funding sources should be sought, and in the spirit of collaboration, there should be multiple entities working on seeking out funding sources. A priority for next steps should be to identify qualified personnel to pursue and prepare grant funding opportunities needed to continue the conservation study. Grant funding sources may be from federal/state government agencies, non-profits and may include an emphasis on habitats, wildlife movement, and wildlife protection measures. In addition, long-term funding will be needed to acquire and/or manage land. Other potential long-term funding sources may be provided through; open space ordinance fees; tipping fees, private sources, and/or non-profit organizations. A single entity should function as the clearinghouse for funding efforts. Budgeting efforts should also consider allocating funds to support regulatory staff to work exclusively on conservation planning in the County.

4. Conduct a Conservation Gap Analysis and Develop a Reserve Design.

Based on the information presented in Section 3, Data Gaps, as well as what is outlined in Principles 3, 7, 9, 11, 12, and 13, a detailed analysis of focal species occurrences and known conservation lands should be initiated. An important step in conservation planning is to conduct a gap analysis, the results of which help develop the biological goals and objectives of a conservation plan. A gap analysis relies on GIS analysis of spatial data (i.e., biological

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

data, land ownership, land uses, and designated management status) to assess the distribution of biological resources (e.g., natural communities, species distributions, known occurrence data) relative to the distribution of protected lands (areas protected and managed to maintain biological resource value) to identify any “gaps” in protection (e.g., biological resources that are on private lands and not well protected). A gap analysis is used to identify gaps in representation, ecological processes or functions, and management of existing protected areas. The identification of gaps helps to focus the attention of the conservation strategy on areas most at risk or that would most benefit from conservation actions (e.g., acquisition, restoration, management, monitoring).

The Vacant Land Survey conducted by the County should be incorporated into the conservation gap analysis to understand what areas are viewed to be generally available for development and what areas could be considered for conservation. The conservation lands inventory and tracking system (discussed above) will also be important for providing the location, ownership, and management regime data that informs the GIS spatial analyses.

A gap analysis is integral to developing the Reserve Design because it provides an understanding of land ownership encumbrances and identifies the wildlife and habitat linkages or connections that can be made with existing conservation areas that would be most beneficial for focal species conservation. Reserve Design is a process which identifies lands needing protection to sustain natural resources while considering ecological, social, and political factors. Reserves are areas set aside to protect natural values such as biodiversity, ecosystem functions, or to offset adverse effects from use or development. The two main objectives of reserves are to achieve species, habitat, and function representativeness and persistence. To meet these basic objectives, a reserve design must consider not only location but size, connectivity, replication, and alignment of boundaries. The Reserve Design will need to incorporate current and future conditions, within reasonable and practical limitations, including climate and urbanization changes to be successful long-term. Datasets used in Reserve Design analyses should be reviewed for quality and accuracy. Areas considered for inclusion into the Reserve Design should be verified through surveys or assessments by a qualified biologist(s) to ensure that the area provides suitable, quality habitat for focal or other target species. Identify Focal Species for Conservation Planning.

As outlined in Section 4, and consistent with Principle 13, more detailed biological analyses are needed for species that would most likely require mitigation in association with regulatory permitting. To understand where focal species locations overlap with development concerns, biological analyses should focus on incorporating complete datasets of species occurrences to support species habitat modeling. This task would be

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

integral to the Gap Analysis and Reserve Design process which identifies important areas for long-term protection and management for focal species. The practicality of “species relocation” should also be considered in cases when abundant and suitable species habitat exists nearby. Forcing habitat connectivity where and when the existing built environment would make for unsafe interactions between humans and some protected (predator) species should be avoided.

Secondary Priorities: Timeframe: 6 to 24 months

5. Create Detailed Conservation Strategies by Conservation Subarea

As presented in Principle 7, conservation planning should be divided into practical subareas. As outlined in Section 5, refinement of the subarea approach should occur to determine which jurisdictions are interested or better suited to be included into specific sub-regions.

Given that the land in the Desert Region is primarily government-owned, coordination with the federal land owners in these areas is the best alternative for conducting conservation planning whereby local jurisdictions may link their open space and/or conservation lands with large areas of government-owned properties. Additionally, if the Desert Renewable Energy Conservation Plan (DRECP) is finalized and approved, local jurisdictions within the DRECP boundaries should confer to decide if the conservation framework identified in the DRECP could benefit their conservation objectives. One potential for the Desert Region would be to have a County led effort with participation from the local jurisdictions which incorporates the conceptual reserve presented in the DRECP into the jurisdiction General Plans. General Plan Policies or overlays can be created that address conservation needs in areas identified in the Gap Analysis, focusing on the areas that lack protection. Aligning local General Plans with the DRECP will allow those jurisdictions to tier off of the DRECP for species permitting. While General Plans provide a potential avenue for obtaining conservation and open space areas, these policies do not include a mechanism to guarantee long-term protection in perpetuity.

The Mountain Region is also predominantly federally owned and managed, therefore connecting jurisdictional open space and conservation lands with public ownership lands through land acquisition or easement procurement should be considered. This is a similar approach recommended for the Desert Region which tiers off of existing protected federal and/or state lands to create a connected system of open space and/or protected lands.

For the Valley Region, several different strategies could be employed. Since the Valley Region consists of 15 different local jurisdictions, each with their own land use authorities, focus should be given to land use patterns for each jurisdiction and potential undeveloped lands that could be conserved should be analyzed. For instance, some

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

jurisdictions in the West Valley area (i.e., Chino, Ontario, Montclair) have few decisions remaining to be made regarding open space that could support listed species (i.e., decisions on open space that would require ESA permitting). Also, these jurisdictions would not have lands that would pose viable biological links to other open space areas. However, other Cities such as Rancho Cucamonga, Fontana, San Bernardino and Rialto still have decisions that will need to be made regarding open space areas. An option for these jurisdictions may be to combine land use planning efforts (with or without the County) to establish a sub-regional comprehensive Reserve Design.

Initially, the focus should be on identifying the areas and linkages that could constitute a cohesive, functional conservation strategy. How best to implement that strategy, and with what specific tools, is a separate but equally important issue (discussed below). It will be important in moving forward not to confuse the end with the means to that end.

One alternative to the more traditional route of completing a Habitat Conservation Plan or a programmatic U.S. Fish and Wildlife Service (USFWS) Section 7 permit, would be to prepare an “alternative conservation plan”. This “alternative plan” approach would utilize the inventory and tracking system, along with the reserve design mentioned above, to provide a plan for which areas of known species occupation or suitable habitat is avoided and conserved through the development process and other means. This “alternative plan” could be implemented voluntarily at a General Plan level. The jurisdictions would need to evaluate the results of the Vacant Land Survey completed by the County, as well as understand the focal species for which regulatory permitting would most likely be required. The jurisdictions’ General Plans could be modified, or the County’s upcoming Countywide Plan could identify the mechanism for which each of these jurisdictions could transfer density credits or bonuses either within a jurisdiction or between jurisdictions to compensate for the “lost” development potential that would become open space/conservation. The Interim Lead/Lead would be responsible for tracking and coordinating these land use efforts to establish the comprehensive reserve design through the alternative plan. The alternative plan would ideally result in no “take” of listed or sensitive species. If “take” permitting is needed, the alternative plan would provide a comprehensive conservation approach to use for species or habitat mitigation. This could be combined with a Waters mitigation plan or County’s programmatic permitting efforts. This alternative plan would provide a more flexible and smaller-scale approach than a traditional HCP, with “front loaded” analysis efforts. Therefore, the alternative plan would speed the development process and also give the conservation community a clear idea, combined with accurate tracking and reporting, of where the conservation will occur. This would be combined with effective management methods, as explained in the next section. The alternative plan approach does not include issuance of a permit by the regulatory Agencies therefore, development of a mechanism (e.g.,

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

Memorandum of Understanding) to provide long-term assurances of Agency acceptance and protection from future changes is needed.

6. *Identify Management Methods.*

Consistent with Principles 14 and 15, management mechanisms for existing and future conservation lands would need to be established by the Interim Lead/Lead. Direct employment of qualified personnel, including qualified biologists, and/or contracting with entities such as IERCD, RLC or CNLM who are qualified and experienced in land management should be a priority. Though the areas to be managed must first be identified before this step could be executed, efforts should be made early to seek out potential entity(ies) that would be able and willing to manage the conservation lands. To ensure that long-term management is sustainable, the Interim Lead/Lead should work with the entity(ies) to identify the costs needed for management and conduct the appropriate analysis (e.g., Property Analysis Record [PAR] analysis) and documentation to substantiate the management funding requirements. It would be in the best interest (i.e., more logistically feasible), and generally looked upon favorably by the Wildlife Agencies, to have one management entity involved, at least for each regional Subarea.

Tertiary Priority: Timeframe: 18 to 36 months

7. *Develop Implementation Strategy.*

Based on the results of the above steps, an implementation strategy should then be developed. The various outcomes could include options outlined in Principle 9 such as: development of habitat conservation plans, mitigation banks, and conservation easements managed by one entity, programmatic Section 7 permits, in lieu fee programs, General Plan policy implementation, and alternative plans (as discussed above in No. 6).

An integral part of any future implementation strategy should be early and ongoing communication with the regulatory agencies about conservation plans. One best practice in the development process to facilitate streamlined regulatory permitting requirements would be to initiate “pre-application” meetings with the regulatory agencies (Army Corps of Engineers, Regional Water Quality Control Board, California Department of Fish and Wildlife, and USFWS). Including these entities in the development process early to discuss mitigation requirements will ultimately provide increased certainty to the development community, and provide a clear path for mitigation requirements which will help move development forward. The Interim Lead/Lead could be the conduit for these “pre-application” meetings, or they may be set up by sub-regions. Incorporating pre-application meetings into the General Plans and land use planning for development is also a way to create comprehensive and cohesive conservation.

San Bernardino Associated Governments
Countywide Habitat Preservation/Conservation Framework Development

INTENTIONALLY LEFT BLANK

San Bernardino Associated Governments Countywide Habitat Preservation/Conservation Framework Development

8 REFERENCES

- 16 U.S.C. 668–668d. Bald and Golden Eagle Protection Act (BGEPA), as amended.
- 16 U.S.C. 703–712. Migratory Bird Treaty Act, as amended.
- 16 U.S.C. 1271–1287. Wild and Scenic Rivers Act.
- 16 U.S.C. 1531–1544. Endangered Species Act of 1973, as amended.
- 33 U.S.C. 1251–1387. Federal Water Pollution Control Act, as amended (commonly referred to as the Clean Water Act).
- 42 U.S.C. 4321–4370f. National Environmental Policy Act of 1969, as amended.
- 50 CFR 17.1–17.108. Endangered and Threatened Wildlife and Plants.
- 64 FR 6183–6186. Executive Order 13112: Invasive Species. February 3, 1999.
- Aerial Information Systems (AIS). 2013. *2013 California Vegetation Map in Support of the Desert Renewable Energy Conservation Plan*. Final report. Prepared for California Department of Fish and Wildlife Renewable Energy Program and the California Energy Commission. Prepared by J. Menke, E. Reyes, A. Glass, D. Johnson, and J. Reyes. April 2013.
- Ardron, J.A., Possingham, H.P., and Klein, C.J. (eds). 2010. *Marxan Good Practices Handbook, Version 2*. Pacific Marine Analysis and Research Association, Victoria, BC, Canada. 165 pages. Available at: www.pacmara.org.
- Beier, P., K.L. Penrod, C. Luke, W.D. Spencer, and C. Cabañero. 2006. “South Coast Missing Linkages: Restoring Connectivity to Wildlands in the Largest Metropolitan Area in the USA.” In *Connectivity Conservation*, edited by K.R. Crooks and M.A. Sanjayan, 555–586. Conservation Biology 14. New York, New York: Cambridge University Press.
- BLM (Bureau of Land Management). 2008. “6840 – Special-Status Species Management.” Accessed November 2014. http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.43545.File.dat/6840.pdf.
- Braden, G., K. Carter, M. Rathbun, L. Pierce, T. Metcalf, and S. Longville. 2009. San Bernardino County Biological Resources Mapping Project. Report submitted to San Bernardino Associated Governments. Prepared by San Bernardino County Museum, Biological Sciences Division and California State University San Bernardino, Water Resources Institute. 91 pp. Received October 15, 2014 by Dudek from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

California Department of Fish and Game (CDFG). 2012. 2012 Vegetation Map in Support of the Desert Renewable Energy Conservation Plan. Interim Report (1.1). Vegetation Classification and Mapping Program for the Desert Renewable Energy Conservation Plan and California Energy Commission. June 2012. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=47996&inline=1>.

California Department of Fish and Wildlife (CDFW). 2013. Element Occurrence Query. California Natural Diversity Database (CNDDDB). RareFind, Version 4.0 (Commercial Subscription). Sacramento, California: CDFG, Biogeographic Data Branch. Accessed September 2013. <http://www.dfg.ca.gov/biogeodata/cnddb/mapsanddata.asp>.

California Department of Fish and Wildlife (CDFW). 2014. California Wildlife Habitat Relationships. Department of Fish and Wildlife Biogeographic Data Branch, 1807 13th Street, Suite 202, Sacramento, CA 95811. Available at: <https://www.dfg.ca.gov/biogeodata/cwhr/>

California Fish and Game Code, Section 1600–1616. Division 2: Department of Fish and Game, Chapter 6: Fish and Wildlife Protection and Conservation.

California Fish and Game Code, Section 2800–2835. Natural Community Conservation Planning Act.

California Fish and Game Code, Section 3500–3516. Division 4: Birds and Mammals, Part 2: Birds, Chapter 1: General Provisions.

California Fish and Game Code, Section 4700. Division 4: Birds and Mammals; Part 3: Mammals; Chapter 8: Fully Protected Mammals.

California Fish and Game Code, Section 5050. Division 5: Protected Reptiles and Amphibians; Chapter 2: Fully Protected Reptiles and Amphibians.

California Public Resources Code, Sections 21000–21177. California Environmental Quality Act (CEQA), as amended.

California Native Plant Society (CNPS). 2014. Rare Plant Program. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website <http://www.rareplants.cnps.org>

City of Adelanto. 2000. *City of Adelanto General Plan Update*. Adopted May 1994. Accessed August 25, 2014. <http://www.ci.adelanto.ca.us/vertical/sites/%7BB5D4A1FE-8A01-4BEF-B964-5A44B9339C72%7D/uploads/%7BDEAB7F4C-C029-4FDE-A927-C895BBE67A87%7D.PDF>.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- City of Barstow. 1997. *City of Barstow General Plan*. Adopted May 21, 1997. Accessed August 25, 2014. <http://cdm16255.contentdm.oclc.org/cdm/ref/collection/p266301ccp2/id/555>.
- City of Big Bear Lake. 1999. Open Space, Parks and Recreation Element. In *City of Big Bear Lake General Plan*. Adopted August 23, 1999. Accessed August 25, 2014. http://www.citybigbearlake.com/images/stories/DOWNLOADS/BUSINESS/PLAN_CHECKS/GENERAL_PLAN_ELEMENTS/Open%20Space%20Parks%20and%20Recreation%20Element.pdf.
- City of Chino. 2010. Open Space and Conservation Element. In *City of Chino General Plan 2025*. Adopted July 2010. Accessed August 25, 2014. <http://www.cityofchino.org/home/showdocument?id=3433>.
- City of Chino Hills. 2014. *City of Chino Hills 2014 General Plan Update*. July 2014. Accessed August 25, 2014. <http://www.chinohills.org/DocumentCenter/View/9805>.
- City of Colton. 1987. Open Space and Conservation Element. In *City of Colton General Plan*. Adopted 1987. Accessed August 25, 2014. <http://ca-colton.civicplus.com/DocumentCenter/View/272>.
- City of Fontana. 2003. Open Space & Conservation Element. In *City of Fontana General Plan*. Adopted October 21, 2003. Accessed August 25, 2014. <https://www.fontana.org/DocumentCenter/Home/View/4302>.
- City of Grand Terrace. 2010. Open Space and Conservation Element. In *City of Grand Terrace General Plan*. Adopted April 27, 2010. Accessed August 25, 2014. <http://www.cityofgrandterrace.org/DocumentCenter/Home/View/696>.
- City of Hesperia. 2014. *2010 City of Hesperia General Plan Update*. Adopted April 15, 2014. Accessed August 25, 2014. <http://www.cityofhesperia.us/DocumentCenter/View/3459>.
- City of Highland. 2006. Conservation and Open Space. In *City of Highland General Plan*. Adopted March 2006. Accessed August 25, 2014. http://www.ci.highland.ca.us/GeneralPlan/PDFs/05-Conservation_&_OS.pdf.
- City of Loma Linda. 2009. Conservation and Open Space Element. In *City of Loma Linda General Plan*. Adopted May 2009. Accessed August 25, 2014. http://www.ci.highland.ca.us/GeneralPlan/PDFs/05-Conservation_&_OS.pdf.

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- City of Montclair. 1999. *City of Montclair General Plan*. Adopted 1999. Accessed August 25, 2014. http://www.cityofmontclair.org/depts/cd/planning/general_plan.asp.
- City of Ontario. 2010. Policy Plan (General Plan): Environmental Resources Element; Biological, Agricultural & Mineral Resources. In *The Ontario Plan*. Adopted January 27, 2010. Accessed August 25, 2014. <http://www.ontarioplan.org/index.cfm/28539>.
- City of Rancho Cucamonga. Resource Conservation. In *Rancho Cucamonga General Plan*. Adopted May 19, 2010. Accessed August 25, 2014. <http://www.cityofrc.us/civica/filebank/blobload.asp?BlobID=6817>.
- City of Redlands. 1995. Open Space and Conservation Element. In *City of Redlands General Plan*. Adopted October, 1995. Accessed August 25, 2014. <http://www.cityofredlands.org/sites/default/files/pdfs/DSD/Section%207.pdf>.
- City of Rialto. 2010. *Rialto General Plan*. Adopted December 2010. Accessed August 25, 2014. http://www.rialto.ca.gov/documents/downloads/General_Plan_Update_2010.pdf.
- City of San Bernardino. 2005. *City of San Bernardino General Plan*. Adopted November 1, 2005. Accessed August 25, 2014. <http://www.sbcity.org/pdf/DevSvcs/General%20Plan%20Document.pdf>.
- City of Twentynine Palms. 2012. Conservation and Open Space Element. In *Twentynine Palms General Plan Update*. Adopted April 2012. Accessed August 25, 2014. http://www.ci.twentynine-palms.ca.us/fileadmin/user_upload/pdf/GeneralPlan2012-Conservation-OpenSpace.pdf.
- City of Upland. 1982. Open Space/Conservation Element. In *City of Upland General Plan*. Adopted June 21, 1982. <http://www.ci.upland.ca.us/pdf/UplandGeneralPlan/0Title-TableofContents.pdf>.
- City of Victorville. 2008. *City of Victorville General Plan 2030*. Adopted October 21, 2008. Accessed August 25, 2014. <http://www.ci.victorville.ca.us/uploadedFiles/CityDepartments/Development/GeneralPlan.pdf>.
- City of Yucaipa. 2004. Open Space. In *City of Yucaipa General Plan*. Adopted July 2004. Accessed August 25, 2014. http://www.yucaipa.org/cityDepartments/DevelopmentServices/General_Plan/Introduction.pdf

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- County of San Bernardino. 2007. *County of San Bernardino 2007 General Plan*. Adopted March 13, 2007. Amended April 24, 2014. Accessed August 25, 2014. <http://www.sbcounty.gov/Uploads/lus/GeneralPlan/FINALGP.pdf>.
- Department of Water Resources (DWR). 2004. CA Watersheds (Calwater221). The State of California's working definition of watershed boundaries. GIS data.
- Economic and Planning Systems, Inc. 2014. Economic Effects of Regional Habitat Conservation Plans. Whitepaper. Prepared for California Habitat Conservation Planning Coalition. March 2014.
- GreenInfo Network. 2014. California Protected Areas Database (CPAD). CPAD version 2014a, March 2014. Download available at: www.CALands.org
- Leidos. 2014. Final Existing Information and Data Gaps for Natural Resources in the SCAG Region. Prepared for Southern California Association of Governments (SCAG), Los Angeles, California by Leidos, Carpinteria, California. April 2014.
- Penrod, K., C. Cabañero, P. Beier, C. Luke, W. Spencer, E. Rubin, and C. Paulman. 2008. *A Linkage Design for the Joshua Tree-Twenty-nine Palms Connection*. Fair Oaks, California: South Coast Wildlands. www.scwildlands.org.
- Penrod, K., P. Beier, E. Garding, and C. Cabanero. 2012. *A Linkage Network for the California Deserts*. Produced for the Bureau of Land Management and the Wildlands Conservancy. Fair Oaks, California and Flagstaff, Arizona: Science and Collaboration for Connected Wildlands and Northern Arizona University.
- Public Law 88-577. Wilderness Act of 1964. September 3, 1964.
- Riverside Land Conservancy. 2008. Greater Prado Basin Habitat Conservation Program 2008. Prepared for The City of Ontario Planning Department. Prepared with assistance from the Trust for Public Land. March 2008. 34 pp.
- San Bernardino County. 2011. Countywide Vision. County of San Bernardino and San Bernardino Associated Governments. Accessed August 21, 2014. http://www.sanbag.ca.gov/news/2011_news/2011_vision.pdf.
- San Bernardino County. 2014. San Bernardino Countywide Vision. Jobs/Economy Element. Business Friendly Best Practices. San Bernardino County Association of Governments. Accessed November 6, 2014. <http://cms.sbcounty.gov/cao-vision/Elements/JobEconomy.aspx>

San Bernardino Associated Governments

Countywide Habitat Preservation/Conservation Framework Development

- Southern California Association of Governments (SCAG). 2008. GIS Land Use Dataset for 2009. San Bernardino County. GIS and Data Services. SCAG Main Office, Los Angeles, California.
- Town of Apple Valley. 2009. *Terra Nova/Town of Apple Valley General Plan*. Adopted August 11, 2009. Accessed August 25, 2014. <http://www.applevalley.org/index.aspx?page=687>.
- Town of Yucca Valley. 2014. Open Space and Conservation. In *Yucca Valley General Plan*. Adopted February 4, 2014. Accessed August 25, 2014. http://www.yucca-valley.org/pdf/planning/General_Plan_web/5_FINAL_OSCweb.pdf.
- U.S. Department of Agriculture (USDA). 2005a. Land Management Plan. Part 1 Southern California National Forests Vision. Angeles National Forest, Cleveland National Forest, Los Padres National Forest, San Bernardino National Forest. Forest Service, Pacific Southwest Region, R5-MB-075, September 2005. 57 pp.
- U.S. Department of Agriculture (USDA). 2005b. Land Management Plan. Part 2 San Bernardino National Forest Strategy. Forest Service, Pacific Southwest Region, R5-MB-079, September 2005. 159 pp.
- U.S. Fish and Wildlife Service (USFWS). 2014. Environmental Conservation Online System. Conservation Plans and Agreements Database. Last updated November 7, 2014. Available at: http://ecos.fws.gov/conserv_plans/public.jsp
- U.S. Forest Service (USFS). 1997. Pacific Southwest Region R5-EM-TP-005. In *Ecological Subregions of California: Section and Subsection Descriptions*. Compiled by S.R. Miles and C.B. Goudey. Accessed August 22, 2007. <http://www.fs.fed.us/r5/projects/ecoregions/toc.htm>.
- US Geological Survey (USGS). 2012. Gap Analysis Program (GAP). November 2012. Protected Areas Database of the United States (PADUS), version 1.3 Combined Feature Class. Available at: <http://gapanalysis.usgs.gov/padus/data/download/>
- VegCAMP, CDFW, and AIS (Vegetation Classification and Mapping Program, California Department of Fish and Wildlife, and Aerial Information Systems Inc.). 2013. *2013 California Desert Vegetation Map and Accuracy Assessment in Support of the Desert Renewable Energy Conservation Plan*. Final. Prepared for the California Department of Fish and Wildlife Renewable Energy Program and the California Energy Commission. March 27, 2013.
- Zeiner, D.C., Laudenslayer, W.F., Mayer, K.E., and White, M. 1990. California's Wildlife. Sacramento, California: California Statewide Wildlife Habitat Relationships System, Department of Fish and Game.

APPENDIX 2A

Outreach Summary – Meetings and Phone Calls

APPENDIX 2A

Outreach Summary – Meetings and Phone Calls

OUTREACH SUMMARY – MEETINGS AND PHONE CALLS

Local Agency Formation Commission for San Bernardino County (LAFCO) Meeting – May 7, 2014

Location: SANBAG Office

Attendees: LAFCO, SANBAG, Dudek

This meeting was for Dudek, SANBAG and LAFCO to discuss the conservation framework study objectives and how each agencies' efforts are related to the framework study. LAFCO provided a history of their efforts related to the conservation surveys they had recently employed. There was lengthy discussion about the history and status of the County Service Area (CSA) 120, which could inform aspects of the framework study. SANBAG and LAFCO shared ideas about conservation in the County and some of the challenges and opportunities that exist throughout the county.

Desert and Mountain Cities Meeting – May 21, 2014

Location: Town of Apple Valley

Attendees: Adelanto, Barstow, Big Bear, Victorville, Yucca Valley, Apple Valley, Dudek, SANBAG

Each jurisdiction discussed their development potential and conservation potential. The relationship of where potential and proposed wildlife corridors are in the desert will be important to understand in relation to where jurisdictions have proposed open space/conservation areas. Adelanto is updating their General Plan to change the land use designation of a large area on the west edge of the City from manufacturing/industrial/residential uses to open space. This could provide an additional conservation buffer to the City and regionally. Victorville has a large specific plan on the north edge of the City that could have open space in the hills that abut other BLM open space areas. Barstow has open space areas proposed as part of their general plan update process as well as some areas owned by PG&E in Hinkley, California that could potentially be set aside as open space. Big Bear has mapped open space and conservation lands which are Flood Control lands or individual project mitigation lands. IERCD manages many of the conserved properties. Yucca Valley adopted an updated General Plan in February 2014. Yucca Valley has mapped wildlife corridor linkage areas. Apple Valley is preparing an HCP which is scheduled for completion in October 2015. The HCP includes important wildlife corridor linkages for big horn sheep and desert tortoise. Dudek requested GIS information from all jurisdictions as a follow up to the meeting discussions.

APPENDIX 2A (Continued)

East Valley Cities Meeting – May 28, 2014

Location: City of Highland

Attendees: Highland, Colton, Yucaipa, Redlands, SANBAG, Dudek

Each jurisdiction discussed development projects that may be associated with conservation or future conservation. Land use policies such as hillside ordinances that may result in open space were discussed. Current development pressures in proximity to the Santa Ana River and conservation lands associated with Delhi Sands Flower-loving Fly were discussed. Highland and Yucaipa have the most potential for additional open space/conservation areas near U.S. Forest Service Lands or other State Park lands that could potentially add to conservation in the future. Highland has potential for over 1,000 acres associated with at least three contiguous projects that could be shared with IERCD, or set aside for a more localized conservation area (i.e. shared with Yucaipa, Redlands, others). Jurisdictions voiced a desire to have the study help identify where consolidated open space could be located, and how those areas could assist multiple jurisdictions with mitigation needs in the future. Jurisdictions voiced the need to understand where the County is in this conservation process.

County Meeting – May 29, 2014

Location: County of San Bernardino Offices

Attendees: County Department of Public Works, Land Use Services, Special Districts, SANBAG, Dudek

The County Department of Public Works has a number of mitigation areas related to past projects. Understanding the geographic distribution of these mitigation areas is important. Flood Control has a lot of ownership in the County that is typically considered open space. They want to keep what is not currently used for Flood Control purposes, as they will need those lands for mitigation for their programmatic permits they are working on with the U.S. Army Corps of Engineers and California Department of Fish and Wildlife. There are some large developments that will need conservation set asides near Lytle Creek and Cajon Creek. County Transportation has no plans for any new major roads that would need significant conservation requirements, nor have there been any significant projects that set aside Conservation. However, the County noted that Route 66 is in need of bridge repairs and that project, if pursued, would require considerable conservation mitigation. Landfill expansions would be within their permitted areas, and so no significant conservation needs would be expected. Vulcan mitigation bank was discussed. County Special Districts provided an overview of their role related to the Etiwanda Preserve and LAFCO's CSA 120. The County has easement over that area, and manages it (1,200 acres). Currently, Special Districts is focused on increasing the endowment funding. There is another area near Joshua Tree that Special Districts is working towards doing the same conservation model as CSA 120.

APPENDIX 2A (Continued)

Inland Empire Resource Conservation District and County Special Districts seem to have an overlap of potential services in the County. One current method for applicants to mitigate for impacts is to set up a CSA or go to the IERCD. There was discussion of how BLM can be used for potential mitigation, or retirement of grazing allotments and mining rights.

A vacant lands inventory was completed by the County which would provide valuable information towards this Conservation Framework study effort.

West Valley Cities Meeting – May 29, 2014

Location: City of Rancho Cucamonga

Attendees: Fontana, Rancho Cucamonga, Ontario, SANBAG, Dudek

Each jurisdiction discussed development projects and where conservation efforts have been focused. The City of Fontana discussed their Delhi Sands Flower-loving Fly mitigation areas as well as an HCP in the north part of the City. The City of Ontario does not have significant open spaces areas. The New Model Colony annexation did require some mitigation which was supposed to take place near Prado Basin. Riverside Land Conservancy was supposed to take fees that the City collected and use that to purchase property in Prado Basin. These efforts have not been started due to the economic downturn. City of Rancho Cucamonga does not have conservation in its City limits, aside from what County Flood Control owns in their City, but there is potential for conservation within its Sphere along the northern boundary. They currently use IERCD for mitigation for projects and this system works well. The City of Rancho Cucamonga has concerns over the long term viability of CSA 120. The Cities of Fontana and Rancho Cucamonga have Hillside Ordinances. Other entities to follow up with related to conservation efforts near and in Rancho Cucamonga include Cucamonga Water District, San Antonio Water Company and City of Los Angeles.

City of Hesperia – June 2, 2014

Phone call – Dave Reno (Hesperia) Scott Priester (Hesperia), Dudek

Hesperia shared past bad experiences related to conservation planning– the West Mojave Plan and the Summit Valley HCP. Both, in their opinions, failed miserably and were a large waste of city resources and time. They are very against any regional HCP planning efforts. In short, the City of Hesperia would not support or be a part of any regional planning efforts, and prefers to do things status quo on a project-by-project basis. If conservation is needed for projects, the City requests avoidance as a first measure and any set asides are given to non-profit or land conservation entities. Currently there are no executed conservation easements in the City. There is only one 11-acre site set aside by a developer for 404 mitigation.

APPENDIX 2A (Continued)

City of Chino Hills – June 3, 2014

Phone call – Joann Lombardo (Chino Hills), Dudek

The City of Chino Hills is almost at build-out. There are currently about 3,000 acres of city-owned open space and 2,000 acres of HOA-owned open space lands mainly focused in the hillside areas. They do have a development code requirement which requires open space set-asides based on slope, so any development that would be proposed in the future in the hillside area would be required to set aside some part of their project for open space. Long term funding is an issue the city is now facing related to their open space areas. The City would most be interested in any county-wide conservation efforts related to funding for maintenance and management of the open space lands.

SANBAG Internal Meeting – Transportation Projects – June 4, 2014

Phone Call – Paula Beauchamp (SANBAG), Julie Vandermost (consultant to SANBAG), Steve Smith (SANBAG), Josh Lee (SANBAG), Dudek

An update was provided to the SANBAG Transportation project manager and consultant about efforts of the conservation planning study. Past SANBAG projects have used mitigation banks as preferred species mitigation methods. Past experience using Flood Control property for SANBAG mitigation worked poorly and they do not want to replicate this again. Vulcan mitigation bank in Cajon Creek is one they have used, as well as Wildlands Mitigation Bank near Cajon Creek and Lytle Creek. Land Veritas Corp. is also proposing another mitigation bank in Chino Hills. SANBAG projects typically result in impacts to San Bernardino kangaroo rat (SBKR) and Waters of the U.S. SANBAG has used Riverside-Corona Resource Conservation District and Santa Ana Watershed Agency (SAWA) for mitigation. Julie Vandermost is currently working on compiling GIS layers of where SANBAG expects to have impacts to habitat and how much mitigation they will need for those impacts. Julie can send to Dudek the GIS data she has for the mitigation study as well as for past mitigation projects. SANBAG plans to use mitigation banks in the future and is in the process of identifying what they will need for mitigation in the future. They have considered setting up their own mitigation bank for their own projects. There was acknowledgement that Caltrans would have their own list of mitigation areas for their projects.

Wildlife Agencies – June 11, 2014

Location: SCAG Riverside Offices

Attendees: USFWS, CDFW, SCAG, SANBAG, Dudek

The USFWS and CDFW (Wildlife Agencies) understand the intent of the SANBAG Conservation Framework project. USFWS noted that San Bernardino County's biggest impacts to species would likely be from water infrastructure projects, namely from groundwater management and controlling water coming off mountains and into valleys. There was

APPENDIX 2A (Continued)

acknowledgement from the group that there are no large transportation projects that are proposed in the foreseeable future that would be an impetus for large amounts of conservation mitigation. Any future transportation projects should however incorporate improvements to bridge culverts and underpasses. There was acknowledgement that flood control activities in the past and from future needs may require some attention related to species mitigation.

There was discussion of the two main HCPs in the Valley area – the Santa Ana River HCP (“River Plan”) being prepared by the water districts to cover Santa Ana Sucker and other species, as well as the “Wash Plan” prepared for the gravel mines in the Santa Ana River near Highland. The USFWS clarified aspects and history of each HCP.

Prado Basin was discussed; discussions were related to connectivity to Chino Creek and how a regional conservation scenario that includes Riverside County is appropriate to understand in this part of San Bernardino County. It was noted that the City of Ontario had plans to mitigate for the New Model Colony project in and around Prado Basin but that the conservation plan had not been started to date.

Species and habitat that commonly need mitigation through the CEQA process in San Bernardino County are burrowing owl, golden eagle and alluvial fan sage scrub. The USFWS indicated that it would be good for jurisdictions to consider proactive ways to mitigate for these species/habitats ahead of time. In order to address complaints from environmental groups against projects, jurisdictions might consider a unified CEQA approach to mitigation for these impacts, or other impacts. Funding of conservation areas is also an area identified by Wildlife Agencies that needs improvement or thought in future conservation planning. Making sure that identification of a management entity that is well funded to undertake the management responsibilities is important to the Wildlife Agencies.

There was discussion about various Mitigation Banks that the Wildlife Agencies were aware of: Vulcan’s Cajon Creek Mitigation Bank and Wildlands Mitigation Bank near the confluence of Cajon Creek and Lytle Creek were discussed. The Wildlife Agencies know of another proposed mitigation bank in Chino Hills area proposed by Land Veritas Corp. and said that they were not sure of the status of that Bank. GIS data for these known Banks would be available upon request.

There was discussion about cross-jurisdictional mitigation and whether that would be something the Wildlife Agencies would view as acceptable. The Wildlife Agencies indicated that there might be biological or ecological reasons for mitigation to occur in a separate jurisdiction as the impact, but there was acknowledgement that there would have to be political support to do this.

There was discussion about how “open space” was defined and if that was the same or different as “conservation”. The Wildlife Agencies said that there would not necessarily be an inherent

APPENDIX 2A (Continued)

conflict between the two, but that if public access was going to be included, as it should, in conservation, that appropriate consideration in the form of possibly, additional lands should be considered to allow for trails, parking areas, etc. There was discussion about the importance of the community and folks living near open space/conservation to buy-in to the principles of those lands and for people to be engaged in using it and protecting it.

When asked about “best practices” related to conservation planning the Wildlife Agencies provided this list: brief the regulatory agencies early; get all regulatory agencies in one room at one time, do not piecemeal the regulatory agency engagement; do not minimize the appearance of project impacts or try to do things that are not practical to avoid impacts; be straightforward with what the impacts are, what the mitigation is – provide a “bright line” for what these are; prepare adequate CEQA documents for projects that will need regulatory permits or approvals.

SCAG shared that they are almost done with their own conservation planning study and will have their own “best practices” list. One area they have found that is popular is having local jurisdictions fund “reimbursable employees”. The employees are funded by the local jurisdiction or project proponent at the regulatory agency and that agency would then have that employee work specifically on that jurisdiction’s projects. This led to a discussion about implementing the “Pre-Application Meetings” for San Bernardino County, similar to what is done for western Riverside County.

Related to the Forest Service areas, the USFWS mentioned that there are areas of known Bald Eagle nesting (Highland area) outside of Forest Service ownership as well as for the unarmored threespine stickleback (fish)(Big Bear Lake area). There was also discussion of the Shay Pond project which supports stickleback. Shay Pond is currently maintained by supplemental water provided through pipelines from the Big Bear City Community Services District. These areas should be considered in future conservation scenarios.

Southern California Gas Company – July 16, 2014 Phone Call with Dudek – Justin Meyer (So Cal Gas)

Southern California Gas Company does not own excess lands that they keep for conservation purposes; their land ownership is related to facilities. Most of their projects that require mitigation are in the high desert and not in the valley areas (as most of those facilities are in developed/disturbed areas). For Waters mitigation, they typically go to IERCD and Mojave RCD. They do not want to be in the business of conducting their own mitigation. For most of their projects they need to mitigate for desert tortoise and utilize existing programmatic permits with BLM/USFWS and an MOU with CDFW. Per these permits, So Cal Gas provides funds directly to BLM and CDFW for mitigation for Endangered Species Act (ESA) issues. If a

APPENDIX 2A (Continued)

regional conservation plan were to be created in San Bernardino County, So Cal Gas would be interested; it would provide one more mitigation option for them.

San Bernardino Valley Water Conservation District and San Bernardino Valley Municipal Water District – July 24, 2014

Location: SANBAG

Attendees: SBVWCD, SBVMWD, SANBAG, Dudek

SBVMWD (MWD) and SBVWCD (WCD) are both actively involved with preparing HCPs. Both Districts have extensive experience and insights with the HCP processes. MWD shared information about their working relationship with the US Fish and Wildlife Service (Service). MWD's opinion was that if the following three things are done, the HCP process will be successful: 1) invest in the science; 2) don't leave the Service to guess; and 3) don't waste the Services' time. The recommendation was to always "leave space on the table" for negotiation. There was discussion about the details of the "Wash Plan" HCP being proposed by WCD and the "Upper Santa Ana River" HCP being proposed by MWD.

The Wash Plan is comprised of public agencies and will include land swaps in order to facilitate more conservation and allow for projects to move forward. The Covered Activities analysis for the Wash Plan took an extensive period of time. Operations and maintenance is included in the Plan. The District is acting on behalf of the other public entities, but a Task Force has been established to oversee the Plan implementation.

The Upper Santa Ana River (SAR) HCP is not a land-consumptive HCP, which is different from most HCP models. The Upper SAR HCP includes specific water projects, and then identifies various restoration projects that will serve as their "mitigation" for the HCP.

The following were helpful insights: funding a full time employee at the Service to work exclusively on the HCP; including Stakeholders that have the ability to thrust and stall the process; be prepared to spend lots of time on the Covered Species list; do not underestimate the human factor; there is a need for someone to champion the HCP effort and make it their mission to have it succeed; it may be harder to complete individual Section 7 consultations in the future as the Service sees that HCPs can be successfully implemented; the staff at the Service are good right now and this is a good time to be processing these kinds of plans.

BLM – August 6, 2014

Phone Call with Dudek: Terri Raml, Russell Schofield, 951-697-5203

Dudek provided BLM with some background on SANBAG's efforts related to the Conservation Planning Study. BLM was interested in how the SANBAG effort would interface with the Desert Renewable Energy Conservation Plan (DRECP). They indicated that the public review draft of

APPENDIX 2A (Continued)

the DRECP was likely to be available in the next few months and portions of it would be helpful to the SANBAG study. Namely, the No Action Alternative would provide good explanations about BLM land uses and designations as well as all the Regional Management Plans that are within the County of San Bernardino. BLM also indicated that the General Conservation Plan within the DRECP was written by the US Fish and Wildlife Service and is intended to provide a programmatic framework of Habitat Conservation Plans so that other jurisdictions or projects could use the same framework for future HCPs. BLM provided clarification about their existing Areas of Critical Environmental Concern (ACEC) designations. The ACECs are areas that have management considerations designed to protect biological or sometimes cultural resources. It is helpful to know that the ACEC designation does indicate a level of biological conservation amongst BLM lands.

Inland Empire Resource Conservation District (IERCD) – August 19, 2014

Location: Dudek Offices

Attendees: IERCD, Dudek

The discussion focused on IERCD's involvement with conservation efforts in the County. Background information was provided by IERCD related to CSA 120, local conservancies, local jurisdictions and LAFCO. IERCD has the ability to collect and manage fees related to endowments. IERCD holds conservation easement for conservation lands. IERCD is working on preparing an In Lieu Fee Program through the Army Corps of Engineers. IERCD is interested in a multi-jurisdictional cooperative for conservation planning. IERCD would be willing to partner with any entity for conservation purposes.

Mojave Desert Resource Conservation District (MDRCD) – August 20, 2014

Phone call with Janet Lindgren, 760-843-6882

The MDRCD does not take ownership or hold land in perpetuity for land conservation. Rather, MDRCD conducts invasive species removal along the Mojave River for various projects and entities needing waters permitting.

APPENDIX 2B

*GIS Database Inventory for the SANBAG
Countywide Habitat Preservation/Conservation
Framework study, San Bernardino County*

APPENDIX 2B
GIS Database Inventory for the SANBAG Countywide Habitat
Preservation/Conservation Framework study, San Bernardino County

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
Federal	Bureau of Land Management (BLM)	National Landscape Conservation System (NLCS) - Wilderness Areas (NLCS_WLD)	2014	1	Polygon data layer of BLM NLCS wilderness areas. Created in 2000, the NLCS includes National Scenic and Historic Trails, Wild and Scenic Rivers, National Monuments, Wilderness Areas, National Conservation Areas and several other specially designated areas. These areas safeguard and unify the best cultural, natural, and recreational resources in the west.
Federal	BLM	National Landscape Conservation System (NLCS) - Wilderness Study Area (WSA) (NLCS_WSA)	2014	2	Polygon data layer of NLCS Wilderness Study Areas. The Federal Land Policy and Management Act of 1976 directed BLM to inventory and study its roadless areas for wilderness characteristics. To be designated as a WSA, an area had to have the following characteristics: <ul style="list-style-type: none"> • Size - roadless areas of at least 5,000 acres of public lands or of a manageable size; • Naturalness - generally appears to have been affected primarily by the forces of nature; • Opportunities - provides outstanding opportunities for solitude or primitive and unconfined types of recreation. WSAs often have special qualities such as ecological, geological, educational, historical, scientific and scenic values. Until Congress makes a final determination on a WSA, the BLM manages these areas to preserve their suitability for designation as wilderness.
Federal	BLM	Wildlife Habitat Management Areas (WHMA) - Multispecies	2002	2	Multispecies management areas on 5 BLM land areas (Bristol, Marble, Cadiz, Danby, Rice). Polygon coverage.
Federal	BLM	Wildlife Habitat Management Areas (WHMA) - Bighorn	2002	2	Management areas on BLM lands for Bighorn Sheep.
Federal	BLM	Wildlife Habitat Management Areas (WHMA) - low3	2002	2	Final "Low Risk" WHMA's (Wildlife Habitat Management Areas) for multiple sensitive plant and animal species and ecological features, Northern and Eastern Colorado Desert Coordinated Management Plan (NECO) Plan Area (from the Preferred, FEIS) (2002).
Federal	BLM	Area of Critical Environmental Concern (ACEC)	2014	1	ACEC designations on BLM lands highlight areas where special management attention is needed to protect, and prevent irreparable damage to important historical, cultural, and scenic values, fish, or wildlife resources or other natural systems or processes; or to protect human life and safety from natural hazards. http://www.blm.gov/ca/gis/
Federal	BLM	Area of Critical Environmental Concern (ACEC) - carb	2014	1	Area of Critical Conservation Concern (ACEC) Conservation Area for carbonate endemic plants (2004), West Mojave Plan portion.
Federal	BLM	Northern and Eastern Colorado Desert Coordinated Management Plan (NECO) - Landforms 1978	1978	2	A landscape-scale, multi-agency planning effort that protects and conserves natural resources while simultaneously balancing human uses of the California portion of the Sonoran Desert ecosystem. The planning area encompasses over five million acres and hosts 60 sensitive plant and animal species. Lands within the planning area are also popular for hiking, hunting, rock hounding, and driving for pleasure. Several commercial mining operations, livestock grazing, and utility transmission lines exist in the area as well. NECO amends the 1980 California Desert Conservation Area (CDCA) plan. Record of Decision approving plan signed 12/19/02. Landforms are habitat types such as alluvial fans, sand dunes, pediments, plains, badlands, lava flows, river washes, dry playas, mesas, tilted plateaus, mountains.
Federal	BLM	Plant, bird, other animal sightings	2001	1	This coverage contains animal, primarily bird, and plant sightings recorded by the biologist at the Ridgecrest and Barstow Field Offices (1968-1996)(n= 136). Note: Several species can exist at a single point, up to five, based on the way the attribution was designed. One must query each of the five attributes when searching for a certain species. Also, there may be duplicate points at a sight if there are more than one species.
Federal	BLM	BLM Eagle Nests	2012	1	Golden eagle (<i>Aquila chrysaetos</i>) nest occurrences. Used for creation of species distribution model for DRECP planning purposes. Golden eagle nest occurrences within 12 km of the Desert Renewable Energy Conservation Plan area. This dataset was created by merging the DRAFT_BRC_EagleNest_Data and Golden_Eagle_DFG layers, which were provided by the BLM. These data represent nest locations recorded by various California State agencies and their contractors during 2008, 2010, 2012 and potentially other unknown time periods.
Federal	BLM	Bat Roost Sites	1998	1	Describes and shows the location of bat roosts within the West Mojave Planning boundary (1978-1998) (n= 23). Data collected by Patricia Brown, Brown-Berry Consulting.
Federal	BLM	Bighorn Sheep Habitat	2006	1	This coverage contains habitat and range characteristics for bighorn sheep within the West Mojave Planning boundary. These data developed and maintained by the BLM, Barstow Field Office and California Desert District.
Federal	BLM	kcm Habitat	2006	1	Kelso Creek monkeyflower (<i>Mimulus shevockii</i>) potential habitat, West Mojave Plan.

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
Federal	BLM	mimo Populations	2006	1	Mojave monkeyflower (<i>Mimulus mohavensis</i>) population locations, West Mojave Plan.
Federal	BLM	West Mojave Plan (WEMO) - Plan Boundary	2006	2	Boundary of the West Mojave Plan. The Plan encompasses 9.3 million acres in the western portion of the Mojave desert and covers sections of San Bernardino, Los Angeles, Kern and Inyo Counties. http://www.blm.gov/ca/st/en/fo/cdd/west_mojave__wemo.html
Federal	BLM	West Mojave Plan (WEMO) - Grazing Allotments	2006	2	Final version of BLM grazing allotments within the West Mojave Plan Area after Plan adoption. Updated with post-Plan changes (i.e. relinquished allotments). Grazing allotment polygons represent BLM land in and surrounding San Bernardino County which have been permitted for rangeland grazing. http://www.blm.gov/ca/st/en/fo/cdd/west_mojave__wemo.html
Federal	BLM	West Mojave Plan (WEMO) - Vegetation	2006	1	Vegetation communities in the West Mojave Planning area. Includes missing data from WM boundary extension. May be somewhat out of date, particularly in urbanizing areas. Vegetation mapping data primarily from West Mojave, China Lake, Ft. Irwin, and Edwards Air Force Base. http://www.blm.gov/ca/st/en/fo/cdd/west_mojave__wemo.html
Federal	BLM	West Mojave Plan (WEMO) - rts Subregions	2002	2	Polygons depicting the route subregions delineated for 2001-2002 inventory, West Mojave Plan (used in DEIS and FEIS). The routes are a network of motorized vehicle access routes. Websites: http://www.blm.gov/ca/st/en/fo/cdd/west_mojave__wemo.html http://www.blm.gov/ca/pdfs/cdd_pdfs/wemo_pdfs/plan/wemo/Vol-1-Chapter1_Bookmarks.pdf
Federal	BLM	West Mojave Plan (WEMO) - rts pt1	2005	2	This is the proposed route network published in the West Mojave Plan FEIS, Nov. 2004, for those areas outside the subregions inventoried in 2002-03. The routes are a network of motorized vehicle access routes. These data are to document the designation decisions of the West Mojave Plan, to create maps for public use, and to share with cooperators and the general public. These data developed and maintained by the U.S. Bureau of Land Management, California Desert District. http://www.blm.gov/ca/st/en/fo/cdd/west_mojave__wemo.html
Federal	BLM	West Mojave Plan (WEMO) - rts pt2	2005	2	This is the proposed route network published in the West Mojave Plan FEIS, February, 2005, for the Superior, Red Mountain, Newberry-Rodman, and Juniper subregions. The routes are a network of motorized vehicle access routes. These data are to document the designation decisions of the West Mojave Plan, to create maps for public use, and to share with cooperators and the general public. These data developed and maintained by the U.S. Bureau of Land Management, California Desert District. http://www.blm.gov/ca/st/en/fo/cdd/west_mojave__wemo.html
Federal	BLM	West Mojave Plan (WEMO) - rts pt3	2005	2	This is the proposed route network published in the West Mojave Plan FEIS, February, 2005, for the Coyote, El Mirage, Kramer, and Fremont subregions. The routes are a network of motorized vehicle access routes. These data are to document the designation decisions of the West Mojave Plan, to create maps for public use, and to share with cooperators and the general public. These data developed and maintained by the U.S. Bureau of Land Management, California Desert District. http://www.blm.gov/ca/st/en/fo/cdd/west_mojave__wemo.html
Federal	BLM	Mohave Ground Squirrel	2006	1	This coverages shows the boundary of the Mohave ground squirrel range within the West Mojave Planning boundary. It was used as a basis for the West Mojave Plan, Mohave Ground Squirrel Conservation Areas. This coverage is old and may be out of date. It is also not very precise and should be used for general display purposes only. These data developed and maintained by the BLM, California Desert District.
Federal	BLM	Conservation Area - alkml	2006	2	Polygon data describing Alkali mariposa lily (<i>Calochortus striatus</i> Parish) conservation areas (Final, used in FEIS West Mojave Plan). This plant is a covered species in the West Mojave Plan.
Federal	BLM	Conservation Area - bws	2006	2	Polygon data describing Barstow woolly sunflower (<i>Eriophyllum mohavense</i>) conservation areas for the West Mojave Plan (used in DEIS and FEIS). This plant is a covered species in the West Mojave Plan.
Federal	BLM	Conservation Area - Imm	2006	2	Polygon data describing Lane Mountain milkvetch (<i>Astragalus jaegerianus</i>) conservation areas for the West Mojave Plan (used in DEIS and FEIS). This plant is a covered species in the West Mojave Plan.
Federal	BLM	Conservation Area - mimo	2006	2	Polygon data describing Mojave monkeyflower (<i>Mimulus mohavensis</i>) conservation areas for the West Mojave Plan (used in DEIS and FEIS). Also includes mining areas and survey areas. This plant is a covered species in the West Mojave Plan.
Federal	BLM	Conservation Area - paph	2006	2	Polygon data describing Parish's phacelia (<i>Phacelia parishii</i>) conservation areas for the West Mojave Plan (used in DEIS and FEIS). This plant is a covered species in the West Mojave Plan.
Federal	BLM	Conservation Area - tobe	2006	2	Polygon data describing Bendire's thrasher (<i>Toxostoma bendirei</i>) conservation areas. This bird is a covered species in the West Mojave Plan.
Federal	BLM	Cattle Exclusion Areas	2006	2	Proposed grazing exclusion areas on cattle allotments for the West Mojave Plan (used in DEIS and FEIS). Polygon data.
Federal	BLM	Grazing Allotments	2014	2	These grazing allotment areas have been discussed and used as potential mitigation/compensation action for certain renewable energy projects through retirement. Grazing allotments have been listed as potential recovery action for desert tortoise. http://www.blm.gov/ca/gis/

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
Federal	BLM	Historical Horse Herd Areas	2006	2	Polygon data depicting Historic Herd Areas which are geographic areas where wild horses and/or burros were found at the passage of the Wild Horse and Burros Act in 1971. Herd Management Areas (HMAs) are those areas within Herd Areas where the decision has been made to manage for populations of wild horses and/or burros. There are 33 Herd Areas and 22 Herd Management Areas within California. http://www.blm.gov/ca/gis/
Federal	BLM	Herd Management Areas	2006	2	The Herd Management Area coverage is a polygon layer of Wild Horse and Burro use areas. A "Herd Area" is defined by the "Wild and Free-Roaming Horse and Burro Program Guidance, January 1983" as "The geographic area identified as having been used by a herd as its yearlong habitat in 1971" and a Herd Management Area" is defined as "A herd area identified in an approved land use plan where wild horses and burros will be maintained and managed." There are nine Herd Management Areas on the Surprise Resource Area, boundaries and attributes for these areas were gathered from various maps and reports. http://www.blm.gov/ca/gis/
Federal	BLM	Minerals	2012	2	Polygon data showing areas of mineral deposits that have some level of existing or foreseeable potential to be collected or mined.
Federal	BLM	Land Surface Estate Boundaries	2014	2	Polygon data showing the administration responsible for lands within SB County (e.g., State, local, preserve management, military).
Federal	BLM	Geothermal Leasing Areas	2014	2	Geothermal lease use areas provide an indication of where impacts from these actions on biological resources are likely to occur. ftp://ftp.blm.gov/pub/CA/gis/ca_sync/geodatabasesZIP
Federal	BLM	Preliminary Renewable Energy ROW	2014	2	This dataset shows proposed and existing solar and wind project site data ; obtained from various BLM field offices or from other sources. Data is "preliminary" due to not being constructed with the official legal descriptions/maps. http://www.blm.gov/wo/st/en/prog/more/Landscape_Approach/reas.html
Federal	BLM	Verified Renewable Energy ROW	2014	2	This dataset shows proposed and existing solar and wind project site data which was constructed in GIS at the California State BLM Office, using hardcopy legal information and/or maps obtained from various California field offices. http://www.blm.gov/wo/st/en/prog/more/Landscape_Approach/reas.html
Federal	BLM	Vegetation Treatment Areas - Proposed	2014	2	The BLM vegetation treatments data contains locations where prescribed burns are planned to take place as well as possible physical vegetation thinning locations. http://www.blm.gov/ca/gis/
Federal	BLM	Vegetation Treatment Areas - Completed	2014	2	The BLM vegetation treatments data contains locations where prescribed burns took place as well as physical vegetation thinning locations. http://www.blm.gov/ca/gis/
Federal	BLM	Off Highway Vehicle (OHV) Areas	2008	2	Off-highway vehicle use areas. Polygon data. Attributes include area names, and status (open, limited use, closed). http://www.blm.gov/ca/gis/
Federal	BLM	Special Recreation Management Area (SRMA) - Existing	2014	2	Polygon coverage that includes nine Special Recreation Management Areas (SRMAs) to be managed Data on areas to be managed for recreation emphasis.
Federal	BLM	Desert Renewable Energy Conservation Plan (DRECP) - Boundary	2014	2	DRECP area boundaries which are used in biological resource planning. http://www.drecp.org/maps/
Federal	BLM	Land Use Planning Areas	2013	2	Boundaries of BLM land use planning areas (v10). http://www.blm.gov/ca/gis/
Federal	BLM	Taylor Grazing Act Districts	2011	2	Taylor Grazing Act districts. The Taylor Grazing Act of 1934 was intended to "stop injury to the public grazing lands by preventing overgrazing and soil deterioration; to provide for their orderly use, improvement, and development; [and] to stabilize the livestock industry dependent upon the public range." This Act was pre-empted by the Federal Land Policy and Management Act of 1976 (FLPMA). http://www.blm.gov/ca/gis/
Federal	BLM	Rapid Environmental Assessments (REAs) - Mojave and Sonoran Deserts	2012	1	Rapid Ecoregional Assessments are intended to provide a landscape-scale perspective of the ecological conditions and trends of an ecoregion, identifying important resource values and patterns of environmental change that may not be evident when managing smaller, local land areas. Various natural resources and biological datasets for the Mojave Basin and Range are available. Data completed 2012 and released to the public August 2013. http://www.blm.gov/wo/st/en/prog/more/Landscape_Approach/reas.html
Federal	BLM	BLM Land Status Dataset	2014	2	BLM land ownership dataset. Land ownership includes Bureau of Land Management, Bureau of reclamation, US Army Corps of Engineers, US Forest Service, National Park Service (Death Valley national Park, Joshua Tree National Park), National Preserves (Mojave National Preserve), Department of Defense (military lands), Bureau of Indian Affairs (Tribal lands), California State Lands Commission. Available at: http://www.blm.gov/ca/gis/
Federal	BLM	BLM Administrative Offices	2014	3	Point data of the BLM administrative offices in San Bernardino County. http://www.geocommunicator.gov/GeoComm/index.htm
Federal	US Department of Agriculture (USDA)	Ecoregions	2013	1	Dataset shows ecoregions that were extracted from a seamless national shapefile. Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. Contains information on division, province, and section. http://www.fs.fed.us/rm/ecoregions/products/map-ecoregions-united-states/

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
Federal	USDA	Ecoregions - Subsections	2013	1	Dataset shows ecoregions subsections that were extracted from a seamless national shapefile. Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. Contains information on division, province, and section. http://www.fs.fed.us/rm/ecoregions/products/map-ecoregions-united-states/
Federal	Natural Resources Conservation Service (NRCS)	Soils - SSURGO Database	2012	1	This SSURGO dataset was created for use in national, regional, and statewide resource planning and analysis of soil data. This is a grid dataset and cannot be used below the grid scale. Partial coverage for San Bernardino county. San Bernardino County has had some soil mapping, predominantly in the southwestern portions, but large tracts of land remain unmapped. The SSURGO database contains information about soil as collected by the National Cooperative Soil Survey over the course of a century. The information can be displayed in tables or as maps. SSURGO datasets consist of map data, tabular data, and information about how the maps and tables were created. The extent of a SSURGO dataset is a soil survey area, which may consist of a single county, multiple counties, or parts of multiple counties. SSURGO map data can be viewed in the Web Soil Survey or downloaded in ESRI® Shapefile format. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053627
Federal	US Geological Survey (USGS)	National Hydrography Dataset (NHD) - point	2012	1	This layer is point data identifying hydrological resources within San Bernardino County. The National Hydrography Dataset (NHD) and Watershed Boundary Dataset (WBD) are used to portray surface water on The National Map. The NHD represents the drainage network with features such as rivers, streams, canals, lakes, ponds, coastline, dams, and stream gages. The WBD represents drainage basins as enclosed areas in eight different size categories. Both datasets represent the real world at a nominal scale of 1:24,000-scale, which means that one inch of The National Map data equals 2,000 feet on the ground. To maintain mapping clarity not all water features are represented and those that are use a moderate level of detail. http://nhd.usgs.gov/data.html
Federal	USGS	National Hydrography Dataset (NHD) - flow line	2012	1	This layer is linear data of hydrological flow in San Bernardino County. The National Hydrography Dataset (NHD) and Watershed Boundary Dataset (WBD) are used to portray surface water on The National Map. The NHD represents the drainage network with features such as rivers, streams, canals, lakes, ponds, coastline, dams, and stream gages. The WBD represents drainage basins as enclosed areas in eight different size categories. Both datasets represent the real world at a nominal scale of 1:24,000-scale, which means that one inch of The National Map data equals 2,000 feet on the ground. To maintain mapping clarity not all water features are represented and those that are use a moderate level of detail. http://nhd.usgs.gov/data.html
Federal	USGS	National Hydrography Dataset (NHD) - waterbody	2012	1	This layer is water body resource data in San Bernardino County. The National Hydrography Dataset (NHD) and Watershed Boundary Dataset (WBD) are used to portray surface water on The National Map. The NHD represents the drainage network with features such as rivers, streams, canals, lakes, ponds, coastline, dams, and stream gages. The WBD represents drainage basins as enclosed areas in eight different size categories. Both datasets represent the real world at a nominal scale of 1:24,000-scale, which means that one inch of The National Map data equals 2,000 feet on the ground. To maintain mapping clarity not all water features are represented and those that are use a moderate level of detail. http://nhd.usgs.gov/data.html
Federal	USGS	Watershed Boundary Dataset (WBD) - HUC12	2012	1	This layer is of watershed boundary data in San Bernardino County. The National Hydrography Dataset (NHD) and Watershed Boundary Dataset (WBD) are used to portray surface water on The National Map. The NHD represents the drainage network with features such as rivers, streams, canals, lakes, ponds, coastline, dams, and stream gages. The WBD represents drainage basins as enclosed areas in eight different size categories. Both datasets represent the real world at a nominal scale of 1:24,000-scale, which means that one inch of The National Map data equals 2,000 feet on the ground. To maintain mapping clarity not all water features are represented and those that are use a moderate level of detail. http://nhd.usgs.gov/data.html
Federal	USGS	mineplant_clip	2005	2	USGS Active mines and mineral plants in the U.S., 2003, published 2005. Received by Dudek via email on June 9, 2014 from Colin Drukker, Placeworks, at the request of Terri Rahhal, Planning Director, Land Use Services Department (LUS). http://mrddata.usgs.gov/mineplant/
Federal	USGS	CA GAP Vegetation	2008	1	The USGS GAP Land Cover Data Set includes detailed vegetation and land use patterns for the continental United States. The data set incorporates the Ecological System classification system developed by NatureServe to represent natural and semi-natural land cover. The 590 land use classes in the data set can be displayed at three levels of detail, from general (8 classes) to most detailed. The Land Cover Data Set can be used to identify those places in the country with sufficient good quality habitat to support wildlife, a key step in developing sound conservation plans. The GAP Land Cover data set is mainly focused on habitat identification. The USGS National Land Cover Database (NLCD) is also available and has more detail in developed areas. http://gapanalysis.usgs.gov/gaplandcover/data/download/

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
Federal	USGS	National Elevation Dataset (NED)	2014	1	The National Elevation Dataset (NED) is the primary elevation data product of the USGS and serves as the elevation layer of The National Map. The NED provides basic elevation information for earth science studies and mapping applications in the United States. NED data is used for global change research, hydrologic modeling, resource monitoring, mapping, visualization, and many other applications. The NED is updated continually to integrate newly available, improved elevation source data. The NED is generated at various horizontal resolutions. These various resolutions, referred to as NED layers, are stored and distributed in geographic coordinates at 1/9, 1/3, 1, and 2 seconds of arc. Each of these layers is derived from the highest quality DEMs available in the NED source database for any geographic location within the conterminous United States, Alaska, Hawaii, Puerto Rico, U.S. territorial islands, Mexico and Canada. The extent of geographic coverage varies by layer. http://nationalmap.gov/elevation.html
Federal	US Forest Service (USFS)	USFS - Species - Wildlife	2014	1	Microsoft Access database sent by Chris Chandler, GIS Coordinator, San Bernardino National Forest via email on May 29, 2014. Database of wildlife observation point data for the San Bernardino National Forest. Observations include reptiles, birds, mammals, insects. Observation dates range from 1900-2014 (some dates in database are unknown). Access database imported into ArcMap 10.2.2 by Dudek GIS staff.
Federal	USFS	USFS - Species - Plants	2014	1	Microsoft Access database sent by Chris Chandler, GIS Coordinator, San Bernardino National Forest via email on May 29, 2014. Database of plant observation point data for the San Bernardino National Forest. Observations include threatened and endangered plant species. Observation dates range from 1981-2014. Access database imported into ArcMap 10.2.2 by Dudek GIS staff.
Federal	USFS	Arroyo Toad (ArroyoToad_ARTO_UPLANDHAB_RIP_OB_BA)	2007	1	Arroyo Toad (ARTO) polygon data layer that includes both known occupied habitat and upland breeding habitat for the San Bernardino National Forest. Upland breeding habitat is based on ARTO_RIP_OB_BA (riparian obligate) plus 100 feet in elevation.
Federal	USFS	Bald Eagle (BaldEagle_BAEA_LOP_060509)	2009	1	Bald Eagle Limiting Operating Period (LOP) Areas for the San Bernardino National Forest. 1/4 mile buffer of Night Roost and known nest sites plus unbuffered known day use areas. Limited Operating Period is Dec 1 - March 31. Polygon data layer. Data credits: Chris Chandler and Sean Redar (SBNF SO). 1989-2002 Update 2007 by Jason Bill.
Federal	USFS	Meadow Habitat (BDF_MEADOW_HABITAT_090408)	2008	1	Final Meadow Habitat layer, with Condition Types, used in Molly Ward's Meadow Recovery Plan, March 2004. San Bernardino National Forest. Chris Wagner of the Mountaintop District Botany staff updated meadows layer using aerial photo interpretation to whole forest as part of Fen assessment in 2007 (unpublished report - Mountaintop Ranger District, San Bernardino National Forest). Many mapped meadows were ground truthed, many were not. Attribute fields for ground truth and remap priority came from this effort. Polygon data layer. Credits: SBNF Fawnskin, Resources Team.
Federal	USFS	Pebble Plains (BDF_PEBBLEPLAINS)	2004	1	Final Pebble Plain Habitat with Condition for San Bernardino National Forest. March 2004. Polygon data layer.
Federal	USFS	Least Bell's Vireo (LeastBellsVireo_LBV_RIP_OB_BA)	2007	1	Least Bell's Vireo - mapped habitat and occurrence data - prepared for Riparian Obligate BA. San Bernardino National Forest.
Federal	USFS	Mountain Yellow-legged Frog (MtnYellowLeggedFrog_MYLF_LOP_INT_061509)	2009	1	Mountain Yellow-legged Frog - mapped habitat and occurrence data LOP (February 1 - October 31). LOP = Limited Operating Period. 500 ft. buffer of MYLF_RIP_OB_BA. Intersected with USGS 7.5' Quadrangles. San Bernardino National Forest. Polygon data layer.
Federal	USFS	Southern Rubber Boa (SouthernRubberBoa_SRB_Habitat_041508)	2008	1	Rubber boa historical habitat. Requires a "Habitat = Yes" Definition Query to show only true habitat (this will exclude the higher elevation areas). Polygon data layer.
Federal	US Fish and Wildlife Service (USFWS)	Designated Critical Habitat	2014	1	These data identify, in general, the areas where final critical habitat exist for species listed as endangered or threatened. Critical habitat are areas considered essential for the conservation of a listed species. Special protections and/or restrictions are possible in areas where federal funding, permits, licenses, authorizations, or actions occur or are required. This dataset is composite of all current final critical habitat datasets that are submitted from various USFWS regional and field offices. The features from these individual datasets are merged into 2 database layers and the shapefiles are an exported product of the polygonal and linear composite database layers. Contains the critical habitat spatial features as described in the Federal Register. http://criticalhabitat.fws.gov/docs/crithab/crithab_all/crithab_all_layers.zip
Federal	USFWS	National Wildlife Refuges (Region1_NWR_Bndy)	2014	2	This dataset depicts approved refuge boundaries for National Wildlife Refuges located in Oregon, Washington, Idaho, Nevada, California, Hawaii and the U.S. Trust Territories in the Pacific Ocean. The primary source for boundary information is the USFWS Realty and Refuge Planning programs. Havasu National Wildlife Refuge is the only refuge in San Bernardino County. Credits: USFWS, Region 1, Division. August 2014. http://www.fws.gov/gis/data/CadastralDB/index.htm
Federal	USFWS	Species Occurrence (USFWS Occurrence)	2014	1	These data identify, in general, multiple species occurrences within jurisdiction of the Carlsbad Fish and Wildlife Office. The database was initially created to map locations of threatened and endangered species which require a survey report under Section 10 of the Endangered Species Act. The database has been expanded to include a few other species of interest. Species observation date range is from 1908-2013.

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
Federal	USFWS	DRECP Species Occurrence (DRECP_SpeciesOccurrence)	2013	1	Species occurrence points within the Desert Renewable Energy Conservation Plan (DRECP) area boundaries. This database was compiled from various sources to create a comprehensive database for special-status plant and wildlife species that have been recorded within the Plan Area and may be considered for coverage under the Plan. Data sources include BLM, USFWS, CDFW, and USFS (San Bernardino National Forest).
Federal	USFWS	Desert Renewable Energy Conservation Plan (DRECP)	2012	2	DRECP area boundaries. The DRECP Plan Area is focused on the Mojave and Colorado desert regions and adjacent lands of seven California counties - Imperial, Inyo, Kern, Los Angeles, Riverside, San Bernardino, and San Diego. The Plan Area covers about 22,587,000 acres. http://www.drecp.org/maps/
Federal	USFWS	Lytle Creek Conservation Bank ("Wildlands")	2014	2	Polygon data describing the boundary location of the Lytle Creek Conservation Bank. Data layer received by Dudek via email on October 15, 2014 from Tony McKinney, USFWS Carlsbad Office. Bank was approved in September 2014: The Lytle Creek Conservation Bank ("Bank") has been approved by the U.S. Fish and Wildlife Service, Palm Springs Regional Office ("USFWS"). The Bank will permanently protect and preserve approximately 182 acres of habitat suitable for the protection of the federally endangered San Bernardino kangaroo rat and Santa Ana River woolly-star. The Bank is located in the Lytle Creek wash area north of interstate 210, southwest of Interstate 215 in San Bernardino County, California near the cities of Fontana and Rialto. The San Bernardino kangaroo rat is federally endangered and listed by the State of California as a Species of Special Concern. It is a small, nocturnal rodent usually found in alluvial washes in the Inland Empire. The Santa Ana River woolly-star is a federally endangered shrub found in similar habitat to the kangaroo rat along the Santa Ana River and its tributaries. A conservation bank is a habitat preserve developed to offset unavoidable permitted impacts to federally endangered species habitat. Public and private development projects occurring within the approved service area can purchase habitat "credits" from the Lytle Creek Conservation Bank with approval from USFWS.
Federal	USFWS	National Wetlands Inventory (NWI)	2014	1	The U.S. Fish and Wildlife Service is the principal Federal agency that provides information to the public on the extent and status of the Nation's wetlands. Through the National Wetlands Inventory, the agency has developed a series of topical maps to show wetlands and deep water habitats. The National Wetlands Inventory provides current geospatially referenced information on the status, extent, characteristics and functions of wetland, riparian, deep water and related aquatic habitats in priority areas to promote the understanding and conservation of these resources. As of May 2014, the wetland geospatial data layer provides on-line map information for all of the conterminous U.S., Hawaii, Puerto Rico, the Virgin Islands, Guam, the major Northern Mariana Islands and 35% of Alaska. This has been accomplished by working with numerous public and private cooperators to produce maps, digital data, and publications. Available at: http://www.fws.gov/wetlands/Data/State-Downloads.html
Federal	Federal Emergency Management Agency (FEMA)	National Flood Hazard Layer (NFHL) (FEMA_FloodHazard)	2014	2	The NFHL is a computer database that contains the flood hazard map information from FEMA's Flood Map Modernization program. These map data are from Digital Flood Insurance Rate Map (DFIRM) databases and Letters of Map Revision (LOMRs). Products and services include MapViewer - Web, utility files to view the NFHL in Google Earth, a Web Map Service, and NFHL GIS data. All of these are available from the Map Service Center at http://msc.fema.gov . FEMA flood risk areas provide an indication of where impacts on biological resources are likely to occur.
State	California Department of Fish and Wildlife (CDFW)	California Essential Habitat Connectivity Project	2010	2	The California Department of Fish and Wildlife and the California Department of Transportation (CalTrans) commissioned a team of consultants to produce a statewide assessment of essential habitat connectivity by February of 2010, using the best available science, data sets, spatial analyses and modeling techniques. The Project identifies large remaining blocks of intact habitat or natural landscape and models linkages between them that need to be maintained, particularly as corridors for wildlife. GIS data is available for download at: http://www.dfg.ca.gov/biogeodata/bios/
State	CDFW	Vegetation	2013	1	Vegetation datasets for the California Deserts. Includes natural communities. Cooperatively produced and maintained by CDFW. Available for download at: http://www.dfg.ca.gov/biogeodata/gis/veg.asp
State	CDFW	California Natural Diversity Database (CNDDDB) - Plants and Animals	2014	1	Inventories the status and locations of rare plants and animals in California . CNDDDB staff work with partners to maintain current lists of rare species as well as maintain an ever-growing database of GIS-mapped locations for these species. The CNDDDB is a "natural heritage program" and is part of a nationwide network of similar programs overseen by NatureServe (formerly part of The Nature Conservancy). http://www.dfg.ca.gov/biogeodata/cnddb/
State	CDFW	California Spotted Owl Nests (CASPO_NEST_052209)	2009	1	From California Natural Diversity Database (CNDDDB). Point data of mapped California spotted owl nests and sites. Includes centroid data. Data range from 1986-2008 (some dates unknown).
State	CDFW	CDFW Owned and Operated Lands	2014	2	Boundary layer of CDFW-owned and operated lands. Downloaded November 20, 2014. Available at: http://www.dfg.ca.gov/biogeodata/gis/clearinghouse.asp

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
State	CDFW	California Wildlife Habitat Relationships (CWHR)	2008	1	California Wildlife Habitat Relationships (CWHR) is an information system for California's wildlife. CWHR contains life history, geographic range, habitat relationships, and management information on 694 species of amphibians, reptiles, birds, and mammals known to occur in the state. The GIS shapefiles are at a 1:1,000,000 scale showing statewide range by season of the 694 terrestrial vertebrates in CWHR. The CWHR System was developed to support habitat conservation and management, land use planning, impact assessment, education, and research involving terrestrial vertebrates in California. Range maps represent the maximum, current geographic extent of each species within California. They were originally delineated at a scale of 1:5,000,000 by species-level experts and have gradually been revised at a scale of 1:1,000,000. Range maps were digitized as GIS layers to support the predictions of the CWHR System software, which allows users to query for wildlife species meeting a set of location and habitat conditions. Presently, they are used to help generate a tabular location database for the system software. Outside the system software, the GIS layers are used to support species richness assessments for statewide conservation planning. Available at: http://www.dfg.ca.gov/biogeodata/cwhr/
State	California Department of Water Resources	Groundwater Basins	2012	3	The shape file shows groundwater basins and subbasins as defined by the California Department of Water Resources. The file is intended for use with GIS software able to import files of suffix '.shp'. Groundwater basins are designated on the basis of geological and hydrological conditions, these usually being the occurrence of alluvial or unconsolidated deposits. When practical, large basins are also subdivided by political boundaries. Basins are named and numbered per the convention of the Department of Water Resources. Many of the subbasin boundaries were developed or modified with public input, but little physical data. Because they should not be considered precise boundaries, a detailed local study should determine whether any specific area lies within a groundwater basin boundary. Available at: http://www.water.ca.gov/groundwater/bulletin118/gwbasins.cfm
County	Southern California Association of Governments (SCAG)	Land Use Data	2008	2	Polygon data on land use within San Bernardino County from SCAG. This database is 2008 GIS land use dataset for 2009. The dataset is parcel-based and developed based on SCAG 2005 land use information, InfoUSA 2008 employment data, 2005-2008 new construction data, as well as inputs from local jurisdictions in the SCAG region.
County	SCAG	Prado Dam - baseline	2014	2	This polygon coverage represents data for baseline habitat values in the Prado Basin and Dam area along the Santa Ana River between the cities of Chino Hills and Norco, San Bernardino and western Riverside Counties. The baseline is a per acre value by habitat type and overall site value for mitigation areas. The values were calculated using a fine-scale CHAP analysis. The purpose of the values are for USACE ecosystem restoration projects. This is from a pilot study. The overall goal of the pilot study, Prado Basin Fine-Scale Assessment, is to evaluate existing habitat conditions at a fine level of resolution within an ecosystem context. Assessment areas include Chino Creek, Mill Creek, Upper Santa Ana River Main Stem, Prado Dam, and Reach 9. Per-acre values were computed for each polygon by adding the species-function matrix (MFRI) value for the habitat type of the polygon and polygon specific habitat-function matrix value. The per-acre value represents the intrinsic worth of an area to fish and wildlife, determined by accounting for species, habitats, and functions. Data layer received by Dudek via email on September 9, 2014 from Kristin Pawling, SCAG. This data is DRAFT only. A final version will be needed prior to use for final conservation planning.
County	SCAG	Land Use Data - General Plan (GP_LandUse)	2008	2	Polygon data describing land use in the County General Plan. This database is 2008 GIS general plan dataset for 2009. The dataset is parcel-based and updated based on local jurisdictions' input in the SCAG region. These data are intended to aid in forecasting land supply and demand for the SCAG region and to be used as a planning tool. To provide GIS users with countywide general plan parcel coverage.
County	Land Use Services (LUS)	Vacant Land Survey (VacantLandSurvey_HeatMap)	2013	2	Polygon coverage showing aggregate heat map of potential development constraints for the entire San Bernardino County. There are 7 categories of potential development constraints: mining, water infrastructure/developed lands, highways and major roads, residential density, lands in planning boundaries, sensitive agricultural lands, and sensitive habitats. Higher point values (red) = more constraints and lower point values (blue) = fewer constraints. Data received by Dudek via email on June 9, 2014 from Colin Drukker, Placeworks, at the request of Terri Rahhal, Planning Director, Land Use Services Department (LUS).
County	LUS	DWR_pipeline	2014	2	Major Water Pipelines, San Bernardino County. Received by Dudek via email on June 9, 2014 from Colin Drukker, Placeworks, at the request of Terri Rahhal, Planning Director, Land Use Services Department (LUS).
County	LUS	MWA_pipeline	2014	2	Major Water Pipelines, San Bernardino County. Received by Dudek via email on June 9, 2014 from Colin Drukker, Placeworks, at the request of Terri Rahhal, Planning Director, Land Use Services Department (LUS).
County	LUS	MWD_pipeline	2014	2	Metropolitan Water District Pipeline Dataset. Major Water Pipelines, San Bernardino County. Received by Dudek via email on June 9, 2014 from Colin Drukker, Placeworks, at the request of Terri Rahhal, Planning Director, Land Use Services Department (LUS).
County	LUS	SBVMWD_pipeline	2014	2	Major Water Pipelines, San Bernardino County. Received by Dudek via email on June 9, 2014 from Colin Drukker, Placeworks, at the request of Terri Rahhal, Planning Director, Land Use Services Department (LUS).

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
County	Local Agency Formation Commission (LAFCO)	CSA 120 - Conservation Area	2014	2	County Service Area (CSA) 120 is a single purpose Board-governed Special District that performs open space and habitat management services. Services include acquisition, preservation, maintenance and operation of land to protect species and historically significant properties. CSA 120 is approx. 9,265 acres. Data layer received by Dudek via email on May 14, 2014 from Samuel Martinez, LAFCO.
County	LAFCO	CSA 70 - Conservation Area (CSA79GH)	2014	2	Polygon layer depicting the boundary of County Service Area (CSA) 70 - Glen Helen (GH). This CSA represents open space/conservation areas. County Service Area 70 Zone GH is governed by the County Board of Supervisors. The zone provides park and recreation, open space and habitat mitigation, sewer, and streetlight services to the Glen Helen area. Data layer received by Dudek via email on May 14, 2014 from Samuel Martinez, LAFCO.
County	Flood Control District	Flood Control District Parcels (FloodControlDistrict_Parcels)	2014	2	Polygon data that depicts the approximate Right-of-Way of the San Bernardino County Flood Control system. Data includes information on type of parcel, responsible party, and dates (e.g., easement, fee owned parcel). Credit: County of San Bernardino Flood Control District.
County	San Bernardino County Museum	SBCM_SBCo_all_species	2009	1	This biological species distribution dataset (point data) was derived from the FWS, CNDDDB, various museum records as delineated in table and San Bernardino County field and collections records and was compiled by San Bernardino County Museum biological research staff. The data represents California and federally listed species, species of special concern, species of interest, and all species detected within the county by SBCM staff during various research projects. This data was compiled for the Museum and other County organizations - specifically SANBAG, to integrate improved biological inventory data into their planning and decision support efforts. This data is derived for planning purposes only. Data is primarily wildlife data (including insects) with a few plant species. Credits: San Bernardino County Museum 2009. Complete Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	SBCM_SBCo_listed_species	2009	1	This biological species distribution dataset (point data) was derived from the FWS, CNDDDB, various museum records as delineated in table and San Bernardino County field and collections records and was compiled by San Bernardino County Museum biological research staff. The data represents California state and federally listed species, species of special concern, and species of interest within San Bernardino County. This data was compiled for the Museum and other County organizations - specifically SANBAG, to integrate improved biological inventory data into their planning and decision support efforts. This data is derived for planning purposes only. Credits: San Bernardino County Museum 2009. Complete Museum dataset received by Dudek via email with download link on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	Kernals - SBCMall_50	2009	1	This data was compiled for the Museum and other County organizations - specifically SANBAG, to integrate improved biological inventory data into their planning and decision support efforts. This analysis footprint is representative of a combined dataset incorporating a Hawth's tools Kernal Density 50% Volume Contour Analysis. This data represents areas within the defined Study Area for the SANBAG biological resources mapping project. These areas would merit further analysis for conservation/mitigation opportunities (polygon data). This data was compiled over 2008 and 2009 and the datasets incorporated into this analysis included species siting data from: San Bernardino County Museum, Los Angeles County Museum, UC Berkeley, US Fish & Wildlife data, California Fish & Game -California Natural Diversity Database (CNDDDB). Each dataset has been compiled from various starting points. The end date for this analysis was Fall of 2008. The study area extent was defined by the San Bernardino County Museum for analyzing data compiled by County biological research staff. The project analysis was limited to a Study Area consisting of county boundaries on the West and South sides extending East near Cabazon and the North including Wrightwood and Big Bear Lake. The Study Area represents SANBAG's greatest concentration of transportation infrastructure for the project analysis. Credits: San Bernardino County Museum 2009. Complete Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	Kernals - SBCMbioAreasLU06Final	2009	2	Polygon data layer showing land use in San Bernardino County. This SANBAG 2006 Land use dataset has been extracted to define land uses that extent was defined by the San Bernardino County Museum for analyzing data compiled by County biological research staff. The project analysis was limited to Study Area consisting of county boundaries on the West and South sides extending East near Cabazon and the North including Wrightwood and Big Bear Lake. The assumption was made by the team that some existing specific land uses have a higher likelihood to be appropriate for mitigation opportunities than others. The team suggested separating SANBAG's 2006 Land use designations into "Eliminated" and "Retained" land uses for possible mitigation. This data was compiled for the Museum and other County organizations - specifically SANBAG, to integrate improved biological inventory data into their planning and decision support efforts. Credits: San Bernardino County Museum 2009. Complete Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
County	San Bernardino County Museum	Kernals - SBCMBioAreasOppsFinal	2008	2	This analysis footprint is representative of a combined dataset incorporating a Hawth's tools Kernal Density 50% Volume Contour Analysis. This data represents areas within the defined Study Area for the SANBAG biological resources mapping project (polygon data). This data was compiled over 2008 and 2009. These areas would merit further analysis for conservation/mitigation opportunities. The datasets incorporated into this analysis included species siting data from: San Bernardino County Museum, Los Angeles County Museum, UC Berkeley, US Fish & Wildlife data, California Fish & Game -California Natural Diversity Database (CNDDDB). The end date for this analysis was Fall of 2008. The study area extent was defined by the San Bernardino County Museum for analyzing data compiled by County biological research staff. The project analysis was limited to Study Area consisting of county boundaries on the West and South sides extending East near Cabazon and the North including Wrightwood and Big Bear Lake. Study Area represents SANBAG's greatest concentration of transportation infrastructure for the project analysis. Credits: San Bernardino County Museum 2008. Complete Museum dataset received by Dudek via email with download link on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	Kernals - SBCMlist50	2008	2	This analysis footprint is representative of a combined dataset incorporating a Hawth's tools Kernal Density 50% Volume Contour Analysis. This data represents areas within the defined Study Area for the SANBAG biological resources mapping project (polygon data). This data was compiled over 2008 and 2009. These areas would merit further analysis for conservation/mitigation opportunities. The datasets incorporated into this analysis included species siting data from: San Bernardino County Museum, Los Angeles County Museum, UC Berkeley, US Fish & Wildlife data, California Fish & Game -California Natural Diversity Database (CNDDDB). The end date for this analysis was Fall of 2008. The study area extent was defined by the San Bernardino County Museum for analyzing data compiled by County biological research staff. The project analysis was limited to Study Area consisting of county boundaries on the West and South sides extending East near Cabazon and the North including Wrightwood and Big Bear Lake. Study Area represents SANBAG's greatest concentration of transportation infrastructure for the project analysis. Credits: San Bernardino County Museum 2008. Complete Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	Kernals - Study Area	2008	2	Polygon boundary layer depicting the San Bernardino County Museum study area. This study area extent was defined by the San Bernardino County Museum for analyzing data compiled by County biological research staff. The project analysis was limited to Study Area consisting of county boundaries on the West and South sides extending East near Cabazon and the North including Wrightwood and Big Bear Lake. Study Area represents SANBAG's greatest concentration of transportation infrastructure for the project analysis. Credits: San Bernardino County Museum 2008. Complete Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	Amphibian Distribution Maps	2009	1	Polygon dataset depicting the distribution of 20 amphibian species in San Bernardino County. This biological species distribution dataset was compiled by San Bernardino County Museum biological research staff. The data represents generalized herptile distributions within San Bernardino County. The data was derived by digitizing each species distribution using a variety of published distribution maps. These maps were modified to reflect current species distribution through firsthand knowledge. The footprints represented by this distribution area is for general purposes only and is not meant to be considered accurate beyond a 1:24000 scale use. Credits: San Bernardino County Museum 2009. Complete Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	Bird Distribution Maps	2009	1	Polygon dataset depicting the distribution of 68 bird species in San Bernardino County. General distribution maps for each species. Original distribution maps provided by NatureServe.Org. Clipped to San Bernardino County boundary. Complete Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	Historic Distribution Maps	2008	1	Historical point data distribution dataset for 21 species of select birds and mammals only. This historical point data distribution was compiled from sources that estimate the historical sightings and actual collection of certain species of interest. This data has been converted to digital form for the Museum and other County organizations - specifically SANBAG, to integrate improved biological inventory of actual and historical data into their planning and decision support efforts. This biological species dataset for includes select bird and mammal species and were derived from two Key resources defining Historical biological point distribution of species in California. This data was compiled for San Bernardino County Museum biological research staff. For the purpose of comparing their compiled data with known historical distribution ranges. The points represent the location of where the specific species was sighted and/or collected. However, it should be noted that the accuracy of these points cannot be relied upon for ground truthing for these points are rough sketches of the approximate location. The sighting and/or collection could be within a 20 mile radius of the specified point. Credits: San Bernardino County Museum 2008. Complete Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
County	San Bernardino County Museum	Mammal Distribution Maps	2009	1	Polygon dataset depicting the distribution of 39 mammal species in San Bernardino County. General distribution maps for each species. Original distribution maps provided by NatureServe.Org. Clipped to San Bernardino County boundary. Complete Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	Reptile Distribution Maps	2009	1	Polygon dataset depicting the distribution of 58 reptile species in San Bernardino County. This biological species distribution dataset was compiled by San Bernardino County Museum biological research staff. The data represents generalized herptile distributions within San Bernardino County. The data was derived by digitizing each species distribution using a variety of published distribution maps. These maps were modified to reflect current species distribution through firsthand knowledge. The footprints represented by this distribution area is for general purposes only and is not meant to be considered accurate beyond a 1:24000 scale use. Credits: San Bernardino County Museum 2009. Complete Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	Critical Habitat	2009	1	Polygon data depicting federally designated Critical Habitat for listed bird, mammal, fish, amphibian, reptile, and plant species that occur in San Bernardino County. Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	Vegetation (Vegetation_SanBernMuseum)	2009	1	Polygon data depicting habitat communities within the mountain and valley planning regions of San Bernardino County. Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	Southern California Critical Biological Areas (SoCal_CriticalBiologicalAreas)	2009	1	Polygon data depicting critical biological land use zones on southern California National Forest lands in San Bernardino County. Data layers includes 8 critical biological areas. Critical Biological Land Use Zones include the most important areas on the Southern California National Forests to manage for the protection of species-at-risk. Facilities are minimal to discourage human use. The level of human use and infrastructure is low to moderate. Wildland/Urban Interface Threat Zones (see Appendix K in Part 3 of the below referenced forest plan) may occur in this zone. Community protection vegetation treatments within the Critical Biological land use zone may occur by exception. In these cases, managers will consider species and habitat needs. The management intent is to retain the natural character and habitat characteristics in this zone and limit the level of human development to manage for protection of species-at-risk. Activities and modification to existing infrastructure are allowed if they are beneficial or neutral to the species for which the zone was primarily designated. Human uses are more restricted in this zone than in Back Country Non-Motorized zones in order to protect species needs, but are not excluded. Low impact uses, such as hiking, mountain biking and hunting are generally allowed. Motorized use of existing National Forest System roads is allowed. Approximately .2 percent of the National Forest System and non-system roads are found in this zone, including three miles of unclassified road. Road density will not be increased and may be decreased as a result of species protection requirements. Used for National Forest planning and assessment and other natural resource applications. Not recommended for use at scales greater than 1:24000. Museum dataset received by Dudek via email on October 15, 2014 from Cameron Brown, GIS Administrator, San Bernardino Associated Governments.
County	San Bernardino County Museum	CSA 120 Conservation Area Species (CSA120_Species_SanBernMuseum)	2012	1	Polygon data depicting the location of listed/sensitive species (bird, plants, mammal, amphibian, reptiles) documented within and adjacent to CSA 120 (County Service Area 120) conservation and open space area in the City of Rancho Cucamonga. Data on biological resources distributions is for General Plan Biotic Resources Overlay data approved by the County of San Bernardino Board of Supervisors on May 22, 2012 under BOS item 92. Data received by Dudek in April 2014 from SANBAG.
County	San Bernardino County Museum	Species Occurrences - Arizona Bell's Vireo, Bald Eagle, Bendire's Thrasher, Burrowing Owl, California Gnatcatcher, Crissal Thrasher, Gila Woodpecker, Least bell's Vireo, Lucy's Warbler, Santa Ana River Woolly-Star, Southwestern Willow Flycatcher, Vermillion Flycatcher, Yuma Clapper Rail	2012	1	Polygon data depicting distribution maps for these select listed/sensitive species in San Bernardino County. Data on biological resources distributions is for General Plan Biotic Resources Overlay data approved by the County of San Bernardino Board of Supervisors on May 22, 2012 under BOS item 92. Data received by Dudek in April 2014 from SANBAG.
County	San Bernardino Valley Water Conservation District	Upper Santa Ana River Habitat Conservation Plan (Santa Ana_HCP)+	2014	2	This polygon layer represents the boundaries of the draft Upper Santa Ana River Habitat Conservation Plan (Upper SAR HCP) area, located mostly in the City of Highland. This draft plan includes 10 water resource, county, and/or city agencies. This coverage was digitized from hard copy maps by Dudek GIS Department staff. It represents the draft Plan area. A final boundary will be needed for any future conservation analyses.

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
City/Town	Highland	Community Development Projects (CityofHighland_CommunityDevProjects)	2014	2	Polygon shapefile data depicting project boundaries for 13 planned/proposed development projects in the City of Highland: Harmony Specific Plan, East Valley Water District Corp Campus, Mediterra Residential Community, Wright Grove, Wood Bridge Planned Development, Glenrose Ranch Planned Development, Greenspot Village & Market Place Specific Plan, Paseo Del Oro Mixed Use Project, East Highlands Ranch PA 39, Hispano Investors, EHR PA 40/42 Blossom Trails, Christianson Property, Development 1 Group. Data coverage received by Dudek via email on May 29, 2014 from Sergio Madera, Associate Planner, City of Highland.
City/Town	Adelanto	North Open Space (AdelantoNorthOpenSpace)+	2014	2	Polygon data depicting the open space area on the west edge of the City of Adelanto as shown on the Adelanto North Composite Plan General Land Use and Zoning map (dated August 29, 2013). This data was received by Dudek on May 21, 2014 as a hard copy land use and zoning map by Mark de Manicor, City of Adelanto. The map was then digitized by Dudek GIS Department staff to create a GIS shapefile.
City/Town	Apple Valley	HCP Proposed Connectivity (AppleValleyHCP_ProposedConnectivity)+	2014	2	Polygon data depicting conservation areas and proposed habitat connectivity areas for the Town of Apple Valley Natural Community Conservation Plan and Habitat Conservation Plan (NCCP/HCP). Data coverage shows the conservation areas under federal or state control that surround Apple Valley and the connectivity proposed through the MSHCP/NCCP that would provide habitat corridors connecting the San Bernardino Mountains and the east and west areas on each side of the 15 freeway through the Wild Wash. With this proposed connectivity there would be approximately 2.4 million square miles of conservation land completely connected in the area. The connection from the San Bernardino Mountains is the only corridor that connects the coastal areas to the desert areas that exists in southern California. This information is a proposed draft. This map and all other maps will be available electronically once the draft HCP/NCCP goes out for public comment in the fall 2014. This data was received by Dudek as a hard copy map (Alternative A Conservation Areas, West Mojave Plan Final EIS/R, Map 2-1, dated July 9, 2004) which was then digitized by Dudek GIS Department staff to create a GIS shapefile. Hard copy map information was received by Dudek May 29, 2014 from Lori Lamson, Assistant Town Manager, Town of Apple Valley.
City/Town	Barstow	Open Space (BarstowOpenSpace)+	2014	2	Polygon data depicting open space/conservation lands and interim open space lands in and surrounding the City of Barstow. This data was received by Dudek as a hard copy land use and zoning map (dated 2014) with land use designations which were then digitized by Dudek GIS Department staff to create a GIS shapefile. The digitized shapefile shows only open space and interim open space areas. The data includes a category description of each location. Land Use and Zoning hard copy map received by Dudek via email on June 12, 2014 by Jennifer Riley, City of Barstow.
City/Town	Big Bear Lake	Habitat Conservation - Possible Sites (BigBearLake_HabitatConservationPossibleSites)+	2014	2	Polygon data depicting boundaries of areas in and surrounding Big Bear Lake for possible conservation set aside. This data was received by Dudek as a list of Assessor Parcel Numbers (APNs) which were then digitized by Dudek GIS Department staff to create a GIS shapefile. The data includes a category description of each location. Additional properties are possible. Data list received by Dudek via email on May 29, 2014 from Jim Miller, City of Big Bear Lake.
City/Town	Fontana	Conservation Areas (CityofFontana_Conservation)+	2014	2	Polygon data depicting the boundaries of two conservation areas within the City of Fontana: Jurupa Hills Conservation Site and Mary Vagle Conservation Site (combined acres = 41). These sites are managed as a Delhi Sands Flower-loving fly preserve. This data was not available from the City as a shapefile. It was received by Dudek as a hard copy report with maps which were then digitized by Dudek GIS Department staff to create a GIS shapefile. Information on preserve boundaries received by Dudek via email on June 3, 2014 from Shannon Casey, Senior Planner, City of Fontana.
Resource Conservation District	Inland Empire Resource Conservation District (IERCD)	IERCD Jurisdiction Boundary (InlandEmpire_RCD)	2014	2	Polygon boundary data showing the area of the IERCD jurisdiction. Data supplied to Mike Sweesy (Dudek) by Mandy Parkes (IERCD) with permission for use.
Resource Conservation District	IERCD	IERCD Mitigation Areas for LAFCO	2014	2	Polygon boundary data of mitigation areas managed by IERCD for LAFCO. Data shows 8 areas that are either mitigation projects or fee title properties/conservation easements. Internal data supplied to Mike Sweesy (Dudek) by Mandy Parkes (IERCD) with permission for use.
Environmental Group	South Coast Wildlands	South Coast Missing Linkages Project – Wildlife Corridors (SCML_WildlifeCorridors)	2010	1	Polygon data showing four wildlife corridor areas in the San Bernardino Mountains, Little San Bernardino Mountains, San Jacinto Mountains, and San Gabriel Mountains. This data is suitable for general map display only and is not appropriate for use for analyses. The South Coast Wildlands is working to maintain and restore connections between wildlands in the South Coast Ecoregion through an effort called the South Coast Missing Linkages Project. This project addresses fragmentation at a landscape scale. The approach is to identify and prioritize linkages that conserve essential biological and ecological processes. This project gathers the most current biological data for each linkage design to ensure the viability of the full complement of species native to the region. Methods involve partnering, gathering existing data, identifying impediments to and opportunities for connectivity, and stimulating a collaborative effort for each important linkage. http://www.scwildlands.org/projects/scml.aspx

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
Environmental Group	South Coast Wildlands	California Desert Connectivity Project – Desert Linkage Network (DesertLinkageNetwork)	2010	1	Polygon data showing wildlife corridor linkages in the mountain and desert regions of San Bernardino County. These linkages connect the South Coast Wildlands Landscape Blocks. Data is for the South Coast Wildlands California Deserts Connectivity Project. This project informs land management and conservation decisions by identifying areas where maintaining or restoring ecological connectivity is essential to conserving the California Desert's biological diversity. This comprehensive connectivity assessment developed 23 Linkage Designs based on several science-based models (e.g., landscape permeability, habitat suitability, patch size and configuration analyses) and field work that evaluates the habitat suitability and movement needs of over 40 selected focal species. http://www.scwildlands.org/projects/desert.aspx
Environmental Group	South Coast Wildlands	Joshua Tree-Twenty-nine Palms Connection – Wildlife Corridors (JT_TP_WildlifeCorridors)	2010	1	Polygon data showing wildlife corridor linkages connecting Joshua Tree National Park and the Marine Corps Air Ground Combat Center (MCAGCC) at Twenty-nine Palms. The Linkage Design for the Joshua Tree – Twenty-nine Palms Connection encompasses basin and range topography with an impressive array of geological formations and broad alluvial fans or bajadas. It includes several major swaths of habitat to accommodate diverse species and ecosystem functions. The two areas targeted to be served by the linkage support a great diversity of species. Joshua Tree provides habitat for more than 250 resident and migratory birds, 52 mammals, 44 reptiles, 3 amphibians, and more than 700 vascular plant species while MCAGCC supports nearly 400 plant species and more than 250 vertebrate wildlife species. http://www.scwildlands.org/projects/jtree.aspx
Environmental Group	South Coast Wildlands	Landscape Blocks (Wildland_Blocks)	2010	1	South Coast Wildlands Landscape Blocks (i.e., areas protected from energy development and roads) used in developing California desert linkage designs. Landscape Blocks include BLM Wilderness Areas and Areas of Critical Environmental Concern (ACEC), national and state parks, federal and state wildlife refuges, private conservation reserves, and military reservations. Data coverage includes 16 different habitat blocks. http://www.scwildlands.org/index.aspx
Environmental Group	Audubon	Christmas Bird Count Data	2013	1	Bird species observations. The longest running Citizen Science survey in the world, the Christmas Bird Count provides critical data on bird population trends. Data from the over 2,300 survey circles are entered after the count and become available to query under the Data & Research link. Data range for observations throughout California is 1900-2013. Data search available at: http://netapp.audubon.org/cbcobservation/
Environmental Group	Audubon	Important Bird Areas	2014	2	A global initiative of BirdLife International, implemented by Audubon and local partners in the United States, the Important Bird Areas Program (IBA) is an effort to identify and conserve areas that are vital to birds and other biodiversity. Main website: http://web4.audubon.org/bird/iba/ Data for San Bernardino County includes polygon boundaries for 9 IBAs: Big Morongo Canyon, Cima Dome, Colorado Desert Microphyll Woodland, East Mojave Peaks, East Mojave Springs, Edwards Air Force Base, Lower Colorado River Valley, Mojave River, North Mojave Dry Lakes. The IBAs are all located in the Desert Region of the County. Data request available at: http://web4.audubon.org/bird/iba/IBADataRequest.html
Environmental Group	Audubon (eBird)	Golden Eagle Occurrence Data	2011	1	Launched in 2002 by the Cornell Lab of Ornithology and National Audubon Society, eBird provides rich data sources for basic information on bird abundance and distribution at a variety of spatial and temporal scales. eBird documents the presence or absence of species, as well as bird abundance through checklist data. A simple and intuitive web-interface engages tens of thousands of participants to submit their observations or view results via interactive queries into the eBird database. eBird collects observations from birders through portals managed and maintained by local partner conservation organizations. California eBird: http://ebird.org/content/ca/ . California eBird data: http://ebird.org/ebird/ca/eBirdReports?cmd=Start . Point data for occurrence locations for Golden Eagle. Data records are from 1969 – 2011.
Environmental Group	Audubon (eBird)	Listed and Sensitive Bird Species Occurrences	2014	1	Point data for occurrence locations for sensitive bird species in San Bernardino County. California eBird data: http://ebird.org/ebird/ca/eBirdReports?cmd=Start .
Environmental Group	HerpNet	HerpNet (Herpetological Occurrences – Museum Records)	2014	1	HerpNet is a collaborative effort by natural history museums to establish a global network of herpetological collections data, funded by the National Science Foundation (NSF No. 0132303) and a GBIF DIGIT grant. Sixty-four institutions participated in the HerpNet community. Data were obtained from records held in museums and institutions and accessed through the HerpNet data portal: http://www.herpNet.org . Note: On 5 January 2015, the HerpNet2 portal will be replaced by the VertNet data portal.
Environmental Group	Hills for Everyone	State Park lands	2015	2	Polygon boundary data showing California State Park lands in San Bernardino County. GIS data sent by Hills for Everyone via email on December 30, 2014 from Melanie Schlotterbeck (Hills for Everyone) to Josh Lee (SANBAG). GIS data was forwarded to Dudek on January 5, 2015 via email.

Table 2-2
GIS Database Inventory for the SANBAG Countywide Habitat Preservation/Conservation Framework study, San Bernardino County

Source Category	Source	Name of Database (Bold Indicates used in Dudek mapping)+	Year	Relevancy*	Description
Environmental Group	GreenInfo Network	California Protected Areas Database (CPAD)	2014	2	The California Protected Areas Database (CPAD) contains GIS data about lands that are owned in fee and protected for open space purposes by almost 1,000 public agencies or non-profit organizations. CPAD includes national/state/regional parks, forests, preserves, and wildlife areas; large and small urban parks that are mainly open space (as opposed to recreational facility structures); land trust preserves owned outright; special district open space lands (watershed, recreation, etc.) and other types of open space. Some lands in CPAD are subject to extensive human use (park development, logging, off-highway vehicle use, etc.) - the term "protected" in CPAD is used broadly and allows that in the entire system of these lands some are owned and managed for other than natural resource purposes. CPAD version 2014a, March 2014. Download available at: www.CALands.org
Environmental Group	U.S. Endowment for Forestry and Communities, Inc.	National Conservation Easement Database (NCED)	2014	2	The National Conservation Easement Database (NCED) is a collaborative venture to compile easement records (both spatial and tabular) from land trusts and public agencies throughout the United States in a single, up-to-date, sustainable, GIS compatible, online source. The goal of the NCED is to provide a comprehensive picture of the privately owned conservation easement lands, recognizing their contribution to America's natural heritage, a vibrant economy, and healthy communities. Conservation easements are legal agreements voluntarily entered into between landowners and conservation entities (agencies or land trusts) for the express purpose of protecting certain societal values such as open space or vital wildlife habitats. In some cases landowners transfer "development rights" for direct payment or for federal and state tax benefits. NCED shows a comprehensive picture of privately owned conservation easement lands in the U.S. The NCED will allow better strategic planning for conservation and development by merging data on land protection with biodiversity and resources, improving ecological and economic plans and investments. State and regional planners and managers will appreciate this dataset as it provides critical contextual information for their work. Institutions responsible for national and international reporting will find this database full of reliable, accurate information for their purposes. The scientific and conservation community will similarly benefit from having this standardized base map to carry out their research and planning objectives. Downloaded October 15, 2014 from: http://nced.conservationregistry.org/projects
Private	Dudek	Bark Beetle Monitoring Data	2011	1	This dataset is a collection of species and resource information by Dudek biologists on lands monitored during the removal of trees infected with bark beetle. Southern California Edison (SCE) project.
Private	Vulcan Materials Company	Vulcan Materials Conservation Parcels - Colton (VMC_Colton)	2014	2	Single polygon representing Vulcan Materials Company conservation parcels for mitigation within the City of Colton. The conservation parcel is 160 acres. Data received by Dudek via email on July 22, 2014 from Michael Linton, Vulcan Materials Company.
Private	Vulcan Materials Company	Cajon Creek Conservation Bank	2014	2	Single polygon representing Vulcan Materials Company conservation bank, north of Rialto. Boundary layer for lands set aside for conservation. Data received by Dudek via email on July 22, 2014 from Michael Linton, Vulcan Materials Company. Data layer also received by Dudek via email from USFWS, Carlsbad office on September 24, 2014. Conservation Bank lands per Doc. 19980046436 recorded 02-09-98 as amended.
Private	Vulcan Materials Company	Cajon Creek Conservation Lands	2014	2	Single polygon representing Vulcan Materials Company conservation lands north of Rialto. Boundary layer for lands set aside for conservation. The conservation lands are adjacent to the Cajon Creek Conservation Bank. Data received by Dudek via email on July 22, 2014 from Michael Linton, Vulcan Materials Company. Conservation lands per Conservation Easement Grant per Doc. 19980046436 recorded 02-09-98.

+ Data coverages received or downloaded as GIS shapefiles or geodatabases unless otherwise noted. Databases denoted with a "+" were received as hard copy maps or location data lists (e.g., locations listed in Microsoft Word document format) which were then digitized by Dudek GIS Department staff to create a GIS shapefile. These data should be considered draft versions requiring follow up verification.

* Relevancy Rank taken from Leidos 2014 for purposes of consistency. Rank 1 = Directly Useful. Can be used to assess habitat or ecosystem conditions or functions in a spatial context. Examples include vegetation maps, wildlife habitat maps, soil surveys, and fire risk maps. Rank 2 = Indirectly Useful. Can be used for land use planning or impact predictions related to habitats and ecosystems. Examples include planning boundaries related to natural resources, land use designations, and management designations. Rank 3 = Little or No Use. Not related to or only tangentially related to identification or assessment of impacts on natural resources. Examples include political boundaries, U.S. Census data, employment data, and earthquake faults.

INTENTIONALLY LEFT BLANK

APPENDIX 2C

SCAG GIS Database Inventory (Abbreviated)
Compared with Dudek GIS Database Inventory,
San Bernardino County*

APPENDIX 2C
SCAG GIS Database Inventory (Abbreviated*) Compared with Dudek GIS Database Inventory, San Bernardino County

Table 2-3
SCAG GIS Database Inventory (Abbreviated*) Compared with Dudek GIS Database Inventory, San Bernardino County.

Dudek Inventory Comparison **	Name of Database	Version	File Type	Data Source	Type	Description	Coverage of San Bernardino County	Relevancy Rank
No	Agricultural Lands	2010	shapefile	Farmland Mapping and Monitoring Program - California Department of Conservation	State	The Farmland Mapping and Monitoring Program (FMMP) produces maps and statistical data used for analyzing impacts on California's agricultural resources. Agricultural land is rated according to soil quality and irrigation status; the best quality land is called Prime Farmland.	Yes	2
No - online	CDFW - Areas of Conservation Emphasis (ACE 2)	On-line database	On-line database	California Department of Fish and Wildlife	State	Areas of Conservation Emphasis (ACE-II) is a Department of Fish and Wildlife (CDFW) project that was begun in 2009 to provide data to help guide and inform conservation priorities in California. The purpose of ACE-II was to compile and analyze the best available statewide, spatial information on California's biological richness, including species diversity, rarity, and sensitive habitats, collect information on recreational needs and opportunities throughout the state, including fishing, hunting and wildlife-viewing, develop a set of tools and produce maps that summarize and display this information for use in conservation decision-making, and integrate these data into a spatial model that can be used to identify areas of biological or conservation interest throughout the state. ACE-II provides an easily-accessible and standardized way to view the best available statewide data on California's biological richness and biodiversity. These datasets have many uses ranging from ecological research and modeling to local land-use planning and conservation decision making. The ACE-II data are dynamic and will be updated periodically as new data warrant. SCAG Staff Note: The data you will have to request from the BIOS Coordinator. I have cc'd Sandra Summers here. Sandra – This is an appropriate use of the data = regional transportation planning.	Yes	1
No+	BLM - Administrative Unit Boundaries	07/01/2011	geodatabase	BLM Geospatial Downloads	Federal	BLM - Administrative Unit Boundaries	Yes	3
Yes	BLM - Areas of Critical Environmental Concern	11/14/2012	geodatabase	BLM Geospatial Downloads	Federal	BLM - Areas of Critical Environmental Concern (ACEC). Where BLM determines that certain public land areas require special management to prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems, it may designate such lands as ACECs.	Yes	1
Yes	BLM - Federal Off Highway Vehicle Areas, CA	12/02/2008	Arc/Info	BLM Geospatial Downloads	Federal	BLM - Federal Off Highway Vehicle Areas, CA	Yes	2
Yes	BLM - Geothermal Leases	01/15/2013	geodatabase	BLM Geospatial Downloads	Federal	BLM - Geothermal Leases	Yes	2
Yes	BLM - grzpca California Range Allotment	12/06/2012	geodatabase	BLM Geospatial Downloads	Federal	BLM - grzpca California Range Allotment	Yes	2
Yes	BLM - Herd Management Area	09/08/2006	Arc/Info	BLM Geospatial Downloads	Federal	BLM - Herd Management Area (HMA). Herd Areas (HAs) are those geographic areas where wild horses and/or burros were found at the passage of the Wild Horse and Burros Act in 1971. Herd Management Areas (HMAs) are those areas within Herd Areas where the decision has been made to manage for populations of wild horses and/or burros. There are 33 Herd Areas and 22 Herd Management Areas within California.	Yes	2
Yes	BLM - Historical Herd Area for Wild Horse and Burro	09/08/2006	Arc/Info	BLM Geospatial Downloads	Federal	BLM - Historical Herd Area for Wild Horse and Burro	Yes	2
Yes	BLM - Land Use Planning Area Boundaries	05/30/2012	geodatabase	BLM Geospatial Downloads	Federal	BLM - Land Use Planning Area Boundaries	Yes	2
Yes	BLM - NLCS Wilderness	11/08/2011	geodatabase	BLM Geospatial Downloads	Federal	BLM - NLCS Wilderness	Yes	2
Yes	BLM - Renewable Energy ROW	01/15/2013	geodatabase	BLM Geospatial Downloads	Federal	BLM - Renewable Energy ROW	Yes	2

Table 2-3
SCAG GIS Database Inventory (Abbreviated*) Compared with Dudek GIS Database Inventory, San Bernardino County.

Dudek Inventory Comparison **	Name of Database	Version	File Type	Data Source	Type	Description	Coverage of San Bernardino County	Relevancy Rank
Yes	BLM - Taylor Grazing Act Districts	10/03/2011	geodatabase	BLM Geospatial Downloads	Federal	BLM - Taylor Grazing Act Districts. The Taylor Grazing Act of 1934 was intended to "stop injury to the public grazing lands by preventing overgrazing and soil deterioration; to provide for their orderly use, improvement, and development; [and] to stabilize the livestock industry dependent upon the public range." This Act was pre-empted by the Federal Land Policy and Management Act of 1976 (FLPMA).	Yes	2
Yes	BLM - Veg Treatments	11/19/2013	geodatabase	BLM Geospatial Downloads	Federal	The BLM vegetation treatments data contained locations where prescribed burns took place as well as physical vegetation thinning locations.	Yes	2
Yes	BLM West Mojave Plan	February 2011	geodatabase	BLM Geospatial Downloads	Federal	West Mojave Plan datasets including air quality, study boundary, grazing, plant, bird, mammal sitings, conservation areas, etc	Yes	3
Yes	California Natural Diversity Database (CNDDB)	Updated every month	shapefile	California Department of Fish and Wildlife	State	Inventories the status and locations of rare plants and animals in California . CNDDB staff work with partners to maintain current lists of rare species as well as maintain an ever-growing database of GIS-mapped locations for these species	Yes	1
Yes	California Protected Areas Database (CPAD)	V2013b	geodatabase	GreenInfo Network	State	Protected open space lands through fee ownerships (does not include all public lands, easements, or most private owners). This dataset is updated regularly - at least once a year. Please check the CPAD website for latest version.	Yes	2
Yes	Desert Renewable Energy Conservation Plan	January 28, 2011	shapefile	Desert Renewable Energy Conservation Plan - implemented by multi agency (federal and state) team called Renewable Energy Action Team (REAT)	Regional	NCCP/HCP/ Land Use Plan Amendment. - California Executive Order S-14-08 requires the development of the Desert Renewable Energy Conservation Plan (DRECP) for the Mojave and Colorado deserts in order to provide binding, long-term endangered species permit assurances and to facilitate the review and approval of compatible renewable energy projects.	Yes	2
N/A	Earthquake / Fault	N/A	.lyr	USGS	Federal	includes ArcGIS files for the Hayward fault map and 1:24,000 USGS base maps		3
Yes	Habitat Essential Connectivity Project	February 2013	geodatabase	California Department of Fish and Wildlife	State	The California Department of Fish and Wildlife and the California Department of Transportation (CalTrans) commissioned a team of consultants to produce a statewide assessment of essential habitat connectivity by February of 2010, using the best available science, data sets, spatial analyses and modeling techniques. The goal was to identify large remaining blocks of intact habitat or natural landscape and model linkages between them that need to be maintained, particularly as corridors for wildlife.	Yes	1
No+	HCP/NCCP Boundaries	February 2013	shapefile	California Department of Fish and Wildlife	State	List of HCP and NCCP boundaries ONLY. Does not include details on conservation areas located within the boundaries	Yes	2
No+	Land Ownership	2009	Access database file	Cal-Atlas Geospatial Clearinghouse	State	A 1:100,000 polygon features class representing public, conservation and trust land ownership in the state of California. Developed for the California Resources Agency's Legacy Project, this dataset depicts ownership features as submitted by major public, trust, and non-profit groups in the state.	Yes	2
No	Landfill locations	updated on weekly basis	text (converted into shapefile)	CalRecycle	State	Data shows location of landfill ONLY, does NOT show location. Includes basic information on each facility in the database including site, enforcement agency, operator, activity type, regulatory status, operational status and latitude/longitude coordinates.	Yes	3

Table 2-3
SCAG GIS Database Inventory (Abbreviated*) Compared with Dudek GIS Database Inventory, San Bernardino County.

Dudek Inventory Comparison **	Name of Database	Version	File Type	Data Source	Type	Description	Coverage of San Bernardino County	Relevancy Rank
N/A	Landslide and Liquefaction - USGS 2003	2003	Arc/Info Grid	US Geological Survey	Federal	This group of maps shows relative susceptibility of hill slopes to the initiation sites of rainfall-triggered soil slip-debris flows in southwestern California. As such, the maps offer a partial answer to one part of the three parts necessary to predict the soil-slip/debris-flow process. A complete prediction of the process would include assessments of "where", "when", and "how big". These maps empirically show part of the "where" of prediction (i.e., relative susceptibility to sites of initiation of the soil slips) but do not attempt to show the extent of run out of the resultant debris flows. Some information pertinent to "when" the process might begin is developed. "When" is determined mostly by dynamic factors such as rainfall rate and duration, for which local variations are not amenable to long-term prediction. "When" information is not provided on the maps but is described later in this narrative. The prediction of "how big" is addressed indirectly by restricting the maps to a single type of landslide process—soil slip-debris flows.	Partial	2
N/A	Landslide and Liquefaction - USGS 1997	1997	.e00	US Geological Survey	Federal	Digital Compilation of Landslide Overview Map of the Conterminous United States. This dataset consists of polygons enclosing areas of landslide incidence and susceptibility for the conterminous United States.	Yes	2
N/A	Landslide and Liquefaction - USGS 2007	2007	shapefile and dbf	US Geological Survey	Federal	This data compilation for open-ocean cliff edges for the California coast is a separate, yet related study to Hapke and others, 2006 documenting shoreline change along sandy shorelines of the California coast, which is itself one in a series that includes the Gulf of Mexico and the Southeast Atlantic coast (Morton and others, 2004; Morton and Miller, 2005). Future reports and data compilations will include coverage of the Northeast U.S., the Great Lakes, Hawaii and Alaska. Cliff edge change is determined by comparing the positions of one historical cliff edge digitized from maps with a modern cliff edge derived from topographic LIDAR (light detection and ranging) surveys. Historical cliff edges for the California coast represent the 1920s-1930s time-period; the most recent cliff edge was delineated using data collected between 1998 and 2002. End-point rate calculations were used to evaluate rates of erosion between the two cliff edges. Please refer to our full report on cliff edge erosion along the California coastline at http://pubs.usgs.gov/of/2007/1133/ for additional information regarding methods and results (Hapke and others, 2007). Data in this report are organized into downloadable layers by region (Northern, Central and Southern California) and are provided as vector datasets with accompanying metadata. Vector cliff edges may represent a compilation of data from one or more sources and the sources used are included in the dataset metadata. This project employs the Environmental Systems Research Institute's (ESRI) ArcGIS as it's Geographic Information System (GIS) mapping tool and contains several data layers (shapefiles) that are used to create a geographic view of the California coast. The vector data form a basemap comprising polygon and line themes that include a U.S. coastline (1:80,000), U.S. cities, and state boundaries.	No	2
N/A	Landslide and Liquefaction - CDC 2002	2002	shapfile and dbf	California Department of Conservation	State	City by city data only. This is a digital Seismic Hazard Zone Map presenting areas where liquefaction and landslides may occur during a strong earthquake. Three types of geological hazards, referred to as seismic hazard zones, may be featured on the map: 1) liquefaction, 2) earthquake-induced landslides, and 3) overlapping liquefaction and earthquake-induced landslides. Developers of properties falling within any of the three zones may be required to investigate the potential hazard and mitigate its threat during the local permitting process	No	2
N/A	Los Angeles County - Significant Ecological Areas (SEAs) - Existing and proposed SEAs	December 2012	shapefile	Los Angeles County	County	The SEA Program is a component of the Los Angeles County General Plan Conservation/Open Space Element. SEAs are areas identified as ecologically important habitat integral to the preservation of rare, threatened or endangered species and the conservation of biological diversity in the County. SEAs are not preserves. Development activities in the SEAs are reviewed by a scientific advisory committee and require a conditional use permit.	No	1

Table 2-3
SCAG GIS Database Inventory (Abbreviated*) Compared with Dudek GIS Database Inventory, San Bernardino County.

Dudek Inventory Comparison **	Name of Database	Version	File Type	Data Source	Type	Description	Coverage of San Bernardino County	Relevancy Rank
Yes	National Conservation Easement (NCED)	September 2013	geodatabase	The Conservation Registry	Federal	The National Conservation Easement Database (NCED) is the first national database of conservation easement information, compiling records from land trusts and public agencies throughout the United States. Voluntary and secure, the NCED respects landowner privacy and will not collect landowner names or sensitive information. This public-private partnership brings together national conservation groups, local and regional land trusts, and state and federal agencies around a common objective. The NCED provides a comprehensive picture of the estimated 40 million acres of conservation easement lands, recognizing their contribution to America's natural heritage, a vibrant economy, and healthy communities.	Yes	2
No	Pacific Crest National Scenic Trail	07-17-2012	shapefile	USDA Forest Service	Federal	2,650 mile scenic trail from California to Canadian border.	Yes	3
No	Protected Areas Database - US by land conservation coop	v1.2	shapefile	USGS Gap Analysis Program	Federal	same as Protected Areas Database - USv10	Yes	2
No	Protected Areas Database - US v10	v1.2	geodatabase	USGS Gap Analysis Program	Federal	geodatabase that illustrates and describes public land ownership, management and conservation lands nationally, including voluntarily provided privately protected areas. The lands included in PAD-US are assigned conservation measures that qualify their intent to manage lands for the preservation of biological diversity and to other natural, recreational and cultural uses; managed for these purposes through legal or other effective means.	Yes	2
No	Protected Areas Database - US v9.3	v.12	geodatabase	USGS Gap Analysis Program	Federal	same as Protected Areas Database - USv10	Yes	2
N/A	Riverside County - Conserved Lands	March 2013	shapefile	Riverside County	County	List of conserved areas in Western Riverside County	No	2
N/A	Santa Monica Mountains Conservancy	March 7, 2013	shapefile	Santa Monica Mountains Conservancy	Regional	List of lands in Conservancy.	No	2
N/A	Coastal Spill Risk Sites (OSPR)	2010, version 2	shapefile	US Fish & Wildlife Service and CDFW Office of Spill Prevention (OSPR)	Federal	Office of Spill Prevention (OSPR) of CDFW identified sites at risk of spills along the coast and links other datasets for sensitive biological resources including species occurrences, natural communities, and ESA Designated Critical Habitat for Threatened & Endangered Species at potential spill sites along the coast. The mission of OSPR is to provide best achievable protection of California's natural resources by preventing, preparing for, and responding to spills of oil and other deleterious materials, and through restoring and enhancing affected resources.	No	2
N/A	Sensitive Species Habitat - Spill Sensitive	2010	shapefile	NOAA	Federal	This data set contains data for Area Contingency Plan (ACP) sensitive sites in Southern California. Vector points in this data set represent sites identified as sensitive for biological and/or human-use resources that should be prioritized for protection during spill response activities. This data set comprises a portion of the ESI data for Southern California. ESI data characterize the marine and coastal environments and wildlife by their sensitivity to spilled oil. The ESI data include information for three main components: shoreline habitats, sensitive biological resources, and human-use resources.	No	1
Yes	Sensitive Species Habitat - ESA Critical Habitat	Dates for each species vary. All critical habitat layers are merged into one dataset so the latest merged dataset was downloaded.	Shapefile	US Fish & Wildlife Service	Federal	View a list of species with final, published critical habitat from the Critical Habitat Data folder. From the species lists you may access: <ul style="list-style-type: none"> • critical habitat spatial data • critical habitat metadata • Federal Register Documents • FWS species profile information 	Yes	1

Table 2-3
SCAG GIS Database Inventory (Abbreviated*) Compared with Dudek GIS Database Inventory, San Bernardino County.

Dudek Inventory Comparison **	Name of Database	Version	File Type	Data Source	Type	Description	Coverage of San Bernardino County	Relevancy Rank
No+	Soil Types	2009	shapefile	Natural Resources Conservation Service	Federal	This data set is a digital soil survey and generally is the most detailed level of soil geographic data developed by the National Cooperative Soil Survey. The information was prepared by digitizing maps, by compiling information onto a planimetric correct base and digitizing, or by revising digitized maps using remotely sensed and other information. This data set consists of georeferenced digital map data and computerized attribute data. The map data are in a 7.5 minute quadrangle format and include a detailed, field verified inventory of soils and nonsoil areas that normally occur in a repeatable pattern on the landscape and that can be cartographically shown at the scale mapped. A special soil features layer (point and line features) is optional. This layer displays the location of features too small to delineate at the mapping scale, but they are large enough and contrasting enough to significantly influence use and management. The soil map units are linked to attributes in the National Soil Information System relational database, which gives the proportionate extent of the component soils and their properties.	Partial	1
No+	Vegetation - USFS	2011	geodatabase	USDA Forest Service	Federal	Northwest California, Sierra Nevada, and Southern California Land and Resource Management Plans and the Quincy Library Group GIS data sets	Yes	1
Yes	Vegetation - CDFW		geodatabase	California Department of Fish and Wildlife	State		No	1
No	Vegetation - CalFire (FRAP mapping)	2003	ArctInfo Grid	California Department of Forestry and Fire Protection	State	Land cover data provide the basis for FRAP analyses of wildlife habitat, water, grazing, and development impacts. No single mapping effort provides GIS data adequate to address this broad range of issues. Efforts to map land cover statewide typically provide insufficient resolution to capture types that occur as "inclusions", such as wet meadows, riparian areas, or certain types of development. Other efforts tend to focus on mapping land cover for a specific geographic area (e.g. bioregion, national park), or theme (e.g. wetlands, farmland). Since resources were targeted to a narrow focus, many of these efforts can make a reasonable claim to be the "best" for their respective area or theme. In order to provide the most solid basis for our analyses, FRAP staff made the decision to take advantage of these sources and merge them into a single GIS data layer.	Yes	1
N/A	Water: Boundary of the 48 Integrated Regional Water Management (IRWM) areas	11/08/2012	shapefile	California Department of Water Resources	State	Boundary of the 48 Integrated Regional Water Management (IRWM) areas	Yes	3
Yes	Water: California Groundwater Basins	v4_1	shapefile	California Department of Water Resources	State	The shape file shows groundwater basins and subbasins as defined by the California Department of Water Resources. The file is intended for use with GIS software able to import files of suffix '.shp'. Groundwater basins are designated on the basis of geological and hydrological conditions, these usually being the occurrence of alluvial or unconsolidated deposits. When practical, large basins are also subdivided by political boundaries, as in the Central Valley. Basins are named and numbered per the convention of the Department of Water Resources. Many of the subbasin boundaries were developed or modified with public input, but little physical data. Because they should not be considered precise boundaries, a detailed local study should determine whether any specific area lies within a groundwater basin boundary. Contact specific agencies listed near end of basin description.	Yes	3
No	Water: Ecosystems	N/A	txt file	NASA Goddard Institute for Space Studies	Federal	Global Distribution of Wetland Ecosystems at 1degree by 1 degree resolution - 5 class distinctions	Yes	1
N/A	Water: Fractional Inundation	N/A	txt file	NASA Goddard Institute for Space Studies	Federal	Global Distribution of Inundated Areal Fraction of 1°x° Cells". In combination with the Wetland Ecosystem dataset, it may be used to calculate wetland areas.	Yes	2

Table 2-3
SCAG GIS Database Inventory (Abbreviated*) Compared with Dudek GIS Database Inventory, San Bernardino County.

Dudek Inventory Comparison **	Name of Database	Version	File Type	Data Source	Type	Description	Coverage of San Bernardino County	Relevancy Rank
No	Water: Impaired Water Bodies	shapefiles revised 2013	shapefile, excel database	State Water Resources Control Board	State	The State Water Board Staff Proposed California 2010 Integrated Report is a compilation of the Regional Water Quality Control Boards' 2008 Integrated Reports with State Board staff recommendations for additions, deletions, or changes. The 2010 Integrated Report provides the recommendations of the staff of the State Water Board for changes to the 2006 Clean Water Act Section 303(d) list of impaired water bodies and Clean Water Act Section 305(b) report on the quality of waters in California. Although the reporting process for 303(d) and 305(b) has been combined, only the 303(d) list requires approval by the State Water Board and USEPA. On August 4, 2010, the State Water Board approved the 303(d) List portion of the 2010 Integrated Report. The 2010 Integrated Report and supporting documents were submitted to the USEPA for final approval on October 11, 2010.	Yes	1
N/A	Water: Inundation Maps	completed 03-12-2010 (Santa Monica), 03-07-2012 (San Diego), 12-15-2008 (Santa Barbara)	ESRI Arc ASCII	NOAA	Federal	The Santa Monica NAVD 88 DEM covers the coastal area surrounding Santa Monica, California including the communities of Los Angeles, Malibu, Marina del Rey, Redondo Beach, Long Beach, and Huntington Beach. The coordinate boundaries are 117.80° to 119.14°W and 33.20°N to 34.20°N. The San Diego DEMs provide coverage of the southern coast of California. The DEMs border Mexico to the south and extends north to Laguna Beach, California. The Santa Barbara DEM covers the coastal region surrounding the town of Santa Barbara, California from Port Hueneme in the southeast to Point Conception in the north west and includes the communities of Port Hueneme, Oxnard, Ventura, Carpinteria, Santa Barbara, Isla Vista, and Goleta. The coordinate boundaries are 119.14°W to 120.51°W and 33.77°N to 34.62°N. ----- Santa Monica, CA 1/3 arc-second NAVD 88 DEM. - downloaded - Santa Monica, CA 1/3 arc-second MHW DEM. ----- San Diego, CA 1/3 arc-second NAVD 88 DEM. - downloaded - San Diego, CA 1/3 arc-second MHW DEM. ----- Santa Barbara, CA 1/3 arc-second MHW DEM - downloaded - no NAVD 88 available	No	3
Yes	Water: National Hydrography Dataset	September 2012	geodatabase	USGS National Hydrography Dataset	Federal	The Watershed Boundary Dataset (WBD) defines the areal extent of surface water drainage to a point, accounting for all land and surface areas. Watershed Boundaries are determined solely upon science-based hydrologic principles, not favoring any administrative boundaries or special projects, nor particular program or agency. The intent of defining Hydrologic Units (HU) for the Watershed Boundary Dataset is to establish a baseline drainage boundary framework, accounting for all land and surface areas. At a minimum, the WBD is being delineated and georeferenced to the USGS 1:24,000 scale topographic base map meeting National Map Accuracy Standards (NMAS). Hydrologic units are given a Hydrologic Unit Code (HUC). For example, a hydrologic region has a 2-digit HUC. A HUC describes where the unit is in the country and the level of the unit. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs143_021581.pdf	Yes	1
No	Water: Regional Water Quality Control Board jurisdictional boundaries	2012	shapefile	State Water Resources Control Board	State	Jurisdictional boundaries for the 9 regional water quality control boards.	Yes	3
No	Watershed Boundary Datasets	September 2012	geodatabase	USDA Natural Resources Conservation Service (NRCS)	Federal	Watershed Boundary Datasets (WBD) provides a uniquely identified and uniform method of subdividing large drainage areas. The data is intended to be used as a tool for water-resource management and planning activities, particularly for site-specific and localized studies requiring a level of detail provided by large-scale map information.	Yes	1

Table 2-3
SCAG GIS Database Inventory (Abbreviated*) Compared with Dudek GIS Database Inventory, San Bernardino County.

Dudek Inventory Comparison **	Name of Database	Version	File Type	Data Source	Type	Description	Coverage of San Bernardino County	Relevancy Rank
Yes	Wetlands - USFWS Wetlands Data Layer (National Wetlands Inventory [NWI])	October 1, 2012	shapefile and geodatabase	US Fish & Wildlife Service	Federal	As of October of 2009, the wetland geospatial data layer provides on-line map information for 82 percent of the conterminous U.S., 31 percent of Alaska and 100 percent of Hawaii. This has been accomplished by working with numerous public and private cooperators to produce maps, digital data, and publications. Currently, efforts are underway to complete and maintain a seamless digital wetlands data set for the Nation. This effort constitutes the Wetlands Data Layer of the National Spatial Data Infrastructure	Yes	1
No	Wetlands - Thematic Mapping of Coastal Wetlands	2006	shapefile	NOAA Coastal Services Center	Federal	Land cover/land use data were developed for the Southern California counties of San Diego, Orange, Los Angeles, Ventura, Santa Barbara, and parts of Riverside and San Bernardino, using 30-meter Landsat satellite imagery. The data separates the area into 39 land types based on the standard Coastal Change Analysis Program (C-CAP) land cover categories. The standard C-CAP categories were expanded to identify certain land use types such as commercial and industrial, golf courses, and suburban residential.	Partial	1
No	Wildfire and hazard areas	11/2007	shapefile	California Department of Forestry and Fire Protection	State	Data shows Fire Hazard Severity Zones in State Responsibility Areas ONLY. Shows "Moderate", "High" and "Very High". Does not show Federal or Local Responsibility Area. Data for local areas is not available from the State website. These zones, referred to as Fire Hazard Severity Zones (FHSZ), provide the basis for application of various mitigation strategies to reduce risks to buildings associated with wildland fires. The zones also relate to the requirements for building codes designed to reduce the ignition potential to buildings in the wildland-urban interface zones. This map has been created by CAL FIRE's Fire and Resource Assessment Program (FRAP) using data and models describing development patterns, estimated fire behavior characteristics based on potential fuels over a 30-50 year time horizon, and expected burn probabilities to quantify the likelihood and nature of vegetation fire exposure to new construction. Details on the project and specific modeling methodology can be found at http://frap.cdf.ca.gov/projects/hazard/methods.htm .	Yes	1
Yes	FEMA: National Flood Hazard Layer (NFHL)	2012	shapefiles	FEMA	Federal	National Flood Hazard Layer (NFHL) dataset is a compilation of effective Digital Flood Insurance Rate Map (DFIRM) databases (a collection of the digital data that are used in GIS systems for creating new Flood Insurance Rate Maps) and Letters of Map Change (Letters of Map Amendment and Letters of Map Revision only) that create a seamless GIS data layer for a State or Territory. It is updated on a monthly basis. Note: Currently, not all areas of a State or Territory have effective DFIRM data. As a result, users may need to refer to the effective Flood Insurance Rate Map for effective flood hazard information. Order from FEMA Map Service Center.	Yes	2
No	USFS Aerial Disease Detection Surveys	2012	geodatabase	USFS	Federal	USFS Aerial Disease Mapping for Region 5 (Southern California) for 2012. More recent data (2013) wasn't currently available in geospatial format.	Partial	1
No+	USFS Forest Inventory	2005	geodatabase	USFS	Federal	USFS Forest Inventory from 2005, most recent data for Cleveland, San Bernardino, Angeles and Los Padres National Forests.	Partial	1
No	Landfire Existing Vegetation Type	2008	raster	USGS	Federal	Landfire Existing Vegetation Type at a 30m pixel resolution	Yes	1
No	Landfire Vegetation Condition Class	2008	raster	USGS	Federal	Landfire Vegetation Condition Class at a 30m pixel resolution	Yes	1
No	FSIM Burn Probability	2012	raster	USFS	Federal	Fire Simulation Burn Probabilities modeled by the US Forest Service Missoula Fire Sciences Laboratory and NIFC	Yes	1
No	Human Footprint	2008	raster	USGS	Federal	Model the influence of anthropogenic disturbance in the western United States	Yes	1
No	Cropland Data Layer	2012	raster	USDA	Federal	The purpose of the Cropland Data Layer Program is to use satellite imagery to (1) provide acreage estimates to the Agricultural Statistics Board for the state's major commodities and (2) produce digital, crop-specific, categorized geo-referenced output products.	Yes	1

Table 2-3
SCAG GIS Database Inventory (Abbreviated*) Compared with Dudek GIS Database Inventory, San Bernardino County.

Dudek Inventory Comparison **	Name of Database	Version	File Type	Data Source	Type	Description	Coverage of San Bernardino County	Relevancy Rank
Yes	gSSurgo Soils Data	2013	vector	NRCS	Federal	The gridded SSURGO (gSSURGO) dataset was created for use in national, regional, and statewide resource planning and analysis of soils data	Partial	1
No	GeoMAC Fire Perimeter	2013	vector	Multi Agency	Federal	Wildland fire perimeters are submitted to GeoMAC by the incidents and then posted to the HTTP site for downloading. While every effort is made to provide accurate and complete information, there may be gaps in daily coverage. Please note: Files only contain perimeter data as they are submitted by the incidents. Files do not contain all fires. This data are not the authoritative fire perimeter data and should not be used as such	Yes	1
No	FAA Wind Turbine Locations	2013	vector	USFWS/FAA	Federal	Locations of Wind turbines assessed for Flight Hazard risk including planned and existing turbines	Yes	2
N/A	Coastal DEM from LIDAR	2010	Raster	NOAA	Federal	Light Detection and Ranging (LiDAR) data is remotely sensed high-resolution elevation data collected by an airborne collection platform. This LiDAR dataset is a survey of Coastal California. The project area consists of approximately 2616 square miles. The project design of the LiDAR data acquisition was developed to support a nominal post spacing of 1 meter. Fugro EarthData, Inc. acquired 1546 flight lines in 108 lifts between October 2009 and August 2011. LiDAR data collection was performed with two Piper Navajo twin engine aircrafts, utilizing a Leica ALS60 MPIA sensor; collecting multiple return x, y, and z as well as intensity data. The bare-earth lidar data was used to create hydro-flattened DEMs (Digital Elevation Models) available for download from the NOAA CSC Digital Coast	No	1
Yes	CA GAP Vegetation	2008	raster	USGS	Federal	The USGS GAP Land Cover Data Set includes detailed vegetation and land use patterns for the continental United States. The data set incorporates the Ecological System classification system developed by NatureServe to represent natural and semi-natural land cover. The 590 land use classes in the data set can be displayed at three levels of detail, from general (8 classes) to most detailed. The Land Cover Data Set can be used to identify those places in the country with sufficient good quality habitat to support wildlife, a key step in developing sound conservation plans.	Yes	1
Yes	National Elevation Dataset (NED) - 30m	2014	raster	USGS	Federal	National Elevation Dataset (NED) at a 30m resolution for the SCAG counties. NED is a new raster product assembled by the U.S. Geological Survey. NED is designed to provide National elevation data in a seamless form with a consistent datum, elevation unit, and projection. Data corrections were made in the NED assembly process to minimize artifacts, perform edge matching, and fill sliver areas of missing data. NED has a resolution of one arc-second (approximately 30 meters) for the conterminous United States, Hawaii, Puerto Rico and the island territories and a resolution of two arc-seconds for Alaska. NED data sources have a variety of elevation units, horizontal datums, and map projections. In the NED assembly process the elevation values are converted to decimal meters as a consistent unit of measure, NAD83 is consistently used as horizontal datum, and all the data are recast in a geographic projection. Older DEM's produced by methods that are now obsolete have been filtered during the NED assembly process to minimize artifacts that are commonly found in data produced by these methods. Artifact removal greatly improves the quality of the slope, shaded-relief, and synthetic drainage information that can be derived from the elevation data.	Yes	1

Table 2-3
SCAG GIS Database Inventory (Abbreviated*) Compared with Dudek GIS Database Inventory, San Bernardino County.

Dudek Inventory Comparison **	Name of Database	Version	File Type	Data Source	Type	Description	Coverage of San Bernardino County	Relevancy Rank
No - online	Calflora	On-line database	On-line database	Calflora	Non-profit	Calflora is a website you can use to learn about plants that grow wild in California (both native plants and weeds). Calflora is a nonprofit organization responsible for the website run by two paid staff members and a few volunteers. Information in Calflora comes from many sources: public agencies, non-profits, scientists, private donors, and you! To find out about a plant species, you can enter the common or scientific name and search the database on-line. The result is an illustrated table of plants that match the name you entered. Click one of the plants in the table to learn a lot of detail about that plant, including where it has been observed in California. You can also enter a place and get an illustrated list of the plants that grow there. We call that What Grows Here? You define "here" by zip code, place name, or any of a number of other ways. You refine "here" by zooming in and out of a map. Then click "Search for Plants" to get an illustrated list of plants known to grow "here."	Yes	1
No - online	Jepson Herbarium	On-line database	On-line database	University of California - University and Jepson Herbaria	State	The University and Jepson Herbaria of the University of California at Berkeley are two collections of pressed plants housed together along with research labs, libraries, and archives. Together the Herbaria hold about 2,200,000 specimens, one of the largest collections in North America	Yes	1
Yes	California Wildlife Habitat Relationships (CWHR)	2008a	Shapefile	California Wildlife Habitat Relationships (WHR) database is a branch of the California Department of Fish and Wildlife (CDFW)	State	The California Wildlife Habitat Relationships (CWHR) database is maintained by the California Department of Fish and Wildlife. The CWHR software is a database application compiled as a stand-alone program in Visual dBase. It can be used to predict the presence of and habitat suitability for 694 terrestrial vertebrates based on geographic distribution, relationships to habitats and stages, seasonal use patterns and presence of habitat elements. Species life history descriptions, habitat descriptions, and custom reports of database queries can be printed. The software also includes BIOVIEW, an application that translates habitat suitability values for wildlife species into data that can be used in a GIS, with an option to apply fuzzy logic to the calculation of these values. A user's manual is included on CD and may be downloaded separately.	Yes	1
N/A	NMFS - DPS and Critical Habitat Datasets	2014	geodatabase	National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA)	Federal	National Marine Fisheries Service (NMFS) data for ESA listed endangered Southern California Steelhead Distinct Population Segment (DPS) boundary (streams and watersheds) and for ESA listed endangered Black Abalone critical habitat. Data also includes historical distribution (streams and watersheds) of Southern California Steelhead DPS.	No	1

* Source of the complete SCAG Natural Resources GIS database Inventory table can be found in Leidos 2014 as Appendix A.

** Yes = Dudek has data layer in GIS inventory database and catalog; No = Dudek does not have data layer in inventory database; No - online = Dudek has not downloaded data layer to inventory database however this data is readily available as an online, searchable database; No+ = Dudek does not have the specific database however Dudek has similar data layers or partial data; N/A = Dudek does not have data layer however it is of little or no use for conservation planning or it is not available for San Bernardino County.

INTENTIONALLY LEFT BLANK

APPENDIX 4A-4B

*Wildlife and Plant Species Known to Occur in
San Bernardino County*

APPENDIX 4A-4B
Wildlife and Plant Species Known to Occur in
San Bernardino County

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
<i>Amphibians</i>					
arroyo toad	<i>Anaxyrus californicus</i>	FE	SSC	Semi-arid areas near washes, sandy riverbanks, riparian areas, palm oasis, Joshua tree, mixed chaparral and sagebrush; stream channels for breeding (typically 3rd order); adjacent stream terraces and uplands for foraging and wintering	Y
California red-legged frog	<i>Rana draytonii</i>	FT	SSC	Lowland streams, wetlands, riparian woodlands, livestock ponds; dense, shrubby or emergent vegetation associated with deep, still or slow-moving water; uses adjacent uplands	Y
Couch's spadefoot	<i>Scaphiopus couchii</i>	BLM	SSC	Desert and arid areas including desert washes, desert riparian, palm oasis, desert succulent scrub and desert scrub habitats; also cultivated cropland	Y
large-blotched salamander	<i>Ensatina klauberi</i>	USFS	SSC	Moist and shaded evergreen and deciduous woodlands	Y
lowland (=Yavapai, San Sebastian & San Felipe) leopard frog	<i>Lithobates yavapaiensis</i>	BLM	SSC	Streams, river side channels, springs, artificial and natural ponds in desert scrub, grassland, woodland and pinyon-juniper woodland	Likely extirpated from CA.
San Gabriel slender salamander	<i>Batrachoseps gabrieli</i>	USFS	None	Talus slopes in forested areas, often near streams	Y
Sonoran desert toad	<i>Incilius alvarius</i>	None	SSC	Aquatic and wetland habitats, artificial flowing waters, and desert washes	Y
Sierra Madre yellow-legged frog	<i>Rana muscosa</i>	FE; USFS	Candidate SE; SSC	Lakes, ponds, meadow streams, isolated pools and open riverbanks; rocky canyons in narrow canyons and in chaparral	Y
yellow-blotched salamander	<i>Ensatina eschscholtzii croceator</i>	BLM; USFS	SSC	Evergreen and deciduous forests, shaded canyons, oak woodlands and chaparral	Y (HYBRID)
<i>Reptiles</i>					
banded gila monster	<i>Heloderma suspectum cinctum</i>	BLM	SSC	Rocky areas in desert scrub and semi-desert grassland	Y
California mountain kingsnake (San Bernardino population)	<i>Lampropeltis zonata (parvirubra)</i>	USFS	SSC	Wide range of habitats including conifer forest, oak-pine woodlands, riparian woodland, chaparral, manzanita and coastal scrub	Y

APPENDIX 4A-4B (Continued)

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
coast horned lizard	<i>Phrynosoma blainvillii</i>	BLM; USFS	SSC	Open areas of sandy soil in valleys, foothills and semi-arid mountains including coastal scrub, chaparral, valley-foothill hardwood, conifer, riparian, pine-cypress, juniper and annual grassland	Y
coastal whiptail	<i>Aspidoscelis tigris stejnegeri</i>	None	None	Open areas in semiarid grasslands, scrublands, and woodlands	Y
desert tortoise	<i>Gopherus agassizii</i>	FT	ST	Arid and semi-arid habitats including sandy or gravelly locations along riverbanks, washes sandy dunes, canyon bottoms, desert oases, rocky hillsides, creosote flats and hillsides.	Y
Mojave fringe-toed lizard	<i>Uma scoparia</i>	BLM	SSC	Loose wind-blown sand dunes, flats with sandy hummocks, washes and banks of rivers	Y
orangethroat whiptail	<i>Aspidoscelis hyperythra</i>	None	SSC	Low-elevation coastal scrub, chaparral, and valley-foothill hardwood	Y
red-diamond rattlesnake	<i>Crotalus ruber</i>	None	SSC	Coastal scrub, chaparral, oak and pine woodlands, rocky grasslands, cultivated areas, and desert flats	Y
rosy boa	<i>Charina trivirgata</i>	USFS	None	Desert and chaparral habitats with rocky soils in coastal canyons and hillsides, desert canyons, washes and mountains	Y
San Bernardino ringneck snake	<i>Diadophis punctatus modestus</i>	USFS	None	Moist habitats, wet meadows, rocky hillsides, gardens, farmland, grassland, chaparral, mixed coniferous forests, and woodlands	Y
San Diego ringneck snake	<i>Diadophis punctatus similis</i>	USFS	None	Moist habitats including wet meadows, rocky hillsides, gardens, farmland grassland, chaparral, mixed conifer forest, and woodland habitats	Y
silvery legless lizard	<i>Anniella pulchra pulchra</i>	USFS	SSC	Stabilized dunes, beaches, dry washes, chaparral, scrubs, pine, oak, and riparian woodlands; associated with sparse vegetation and sandy or loose, loamy soils	Y
Sonoran mud turtle	<i>Kinosternon sonoriense</i>	None	SSC	Desert ponds, slow-moving shaded streams and rivers and cattle tanks; usually in woodlands and occasionally grasslands	Thought to be extinct in CA.
southern rubber boa	<i>Charina umbratica</i>	USFS	ST	Montane oak-conifer and mixed conifer forests, montane chaparral, wet meadows; usually in vicinity of streams or wet meadows	Y
two-striped garter snake	<i>Thamnophis hammondi</i>	BLM; USFS	SSC	Streams, creeks, pools, streams with rocky beds, ponds, lakes, vernal pools	Y
western pond turtle	<i>Emys marmorata</i>	BLM; USFS	SSC	Slow-moving permanent or intermittent streams, ponds, small lakes, reservoirs with emergent basking sites; adjacent uplands used during winter	Y

APPENDIX 4A-4B (Continued)

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
<i>Birds</i>					
American bittern	<i>Botaurus lentiginosus</i>	None	None	Nests in marshes with fairly tall freshwater vegetation (3-4 feet) and shallow water (less than 1 foot) near rivers, ponds, and lakes	W
American white pelican	<i>Pelecanus erythrorhynchos</i> (nesting colony)	None	SSC	Nests colonial on isolated islands in freshwater lakes with sandy, earthen, or rocky substrates; minimal disturbance from humans or mammalian predators required, as is close access to productive foraging areas; forages on inland marshes, lakes or rivers; winters on shallow coastal bays, inlets and estuaries	NB
Arizona bell's vireo	<i>Vireo bellii arizonae</i> (nesting)	BCC	SE	Nests and forages in lowland riparian areas with low, shrubby vegetation	Y
bald eagle	<i>Haliaeetus leucocephalus</i> (nesting & wintering)	Delisted; USFS; BCC	SE; CDF; FP	Nests in forested areas adjacent to large bodies of water, including seacoasts, rivers, swamps, large lakes; winters at large bodies of water in lowlands and mountains	B/W
Bell's sage sparrow	<i>Amphispiza belli belli</i>	None	WL	Nests and forages in coastal scrub and dry chaparral; typically in large, unfragmented patches dominated by chamise; nests in more dense patches but uses more open habitat in winter	Y
Bendire's thrasher	<i>Toxostoma bendirei</i>	BLM; BCC	SSC	Nests and forages in desert succulent shrub and Joshua tree habitat in Mojave Desert; nests in yucca, cholla and other thorny scrubs or small trees	Y
black swift	<i>Cypseloides niger</i> (nesting)	BCC	SSC	Nests in moist crevices, caves, and cliffs behind or adjacent to waterfalls in deep canyons; forages over a wide range of habitats	B
black-chinned sparrow	<i>Spizella atrogularis</i> (nesting)	BCC	None	Nests and forages in mixed chaparral, chamise-redshank chaparral, sagebrush and other brushy habitats	B
Brewer's sparrow	<i>Spizella breweri</i> (nesting)	BCC	None	Nests in treeless shrub habitat with moderate canopy, especially sagebrush; winters in open desert scrub and croplands in southern Mojave and Colorado deserts	B/W
brown-crested flycatcher	<i>Myiarchus tyrannulus</i> (nesting)	None	WL	Desert riparian habitat along Colorado River and other desert oases; riparian thickets, trees, snags, and shrubs uses a perches; nests in woodpecker-excavated cavities	B

APPENDIX 4A-4B (Continued)

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
burrowing owl	<i>Athene cunicularia</i> (burrow sites & some wintering sites)	BLM; BCC	SSC	Nests and forages in grassland, open scrub, and agriculture, particularly with ground squirrel burrows.	Y
California black rail	<i>Laterallus jamaicensis coturniculus</i>	BCC	ST; FP	Tidal marshes, shallow freshwater margins, wet meadows and flooded grassy vegetation; suitable habitats are often supplied by canal leakage in Sierra foothill populations	Y (SE CORNER ONLY)
California brown pelican	<i>Pelecanus occidentalis californicus</i> (nesting colonies and important communal roosting sites)	Delisted	Delisted; FP	Forage in warm coastal marine and estuarine environments; in California, breeds on dry, rocky offshore islands	Dispersal only
California horned lark	<i>Eremophila alpestris actia</i>	None	WL	Nests and forages in grasslands disturbed lands, agriculture, and beaches; nests in alpine fell fields of the high Sierra	Y
California spotted owl	<i>Strix occidentalis occidentalis</i>	BLM; BCC; USFS	SSC	Nests and forages in dense, old-growth, multi-layered mixed conifer, redwood and Douglas-fir habitats	Y
coastal California gnatcatcher	<i>Poliophtila californica californica</i>	FT	None	Nests and forages in various sage scrub communities, often dominated by California sagebrush and buckwheat; generally avoids nesting in areas with a slope of greater than 40%, and typically less than 1,000 feet in elevation	Y
Cooper's hawk	<i>Accipiter cooperii</i> (nesting)	None	WL	Nests and forages in dense stands of live oak, riparian woodlands, or other woodland habitats often near water	Y/NB
Crissal thrasher	<i>Toxostoma crissale</i>	None	SSC	Nests and forages in desert riparian and desert wash; dense thickets of sagebrush and other shrubs such as mesquite, iron catclaw acacia, and arrowweed willow within juniper and pinyon-juniper woodlands	Y
double-crested cormorant	<i>Phalacrocorax auritus</i> (nesting colony)	None	WL	Nests in riparian trees near ponds, lakes, artificial impoundments, slow-moving rivers, lagoons, estuaries and open coastlines; winter habitat includes lakes, rivers, and coastal areas	B/W
Eagle Mountain scrub-jay	<i>Aphelocoma californica cana</i>	None	WL	Nests and forages in pinyon-juniper woodlands	Y (EAGLE MOUNTAIN ONLY)

APPENDIX 4A-4B (Continued)

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
elf owl	<i>Micrathene whitneyi</i> (nesting)	BCC	SE	Nests in desert riparian with cottonwood, sycamore, willow, and mesquite.	B
ferruginous hawk	<i>Buteo regalis</i> (wintering)	BCC	WL	Winters and forages in open, dry country, grasslands, open fields, agriculture	W
flammulated owl	<i>Otus flammeolus</i> (nesting)	BCC	None	Coniferous forest with low to intermediate canopy cover at 6,000-10,000 ft in elevation.	B
Gila woodpecker	<i>Melanerpes uropygialis</i>	BCC	SE	Nests and forages in Saguaro desert, riparian woodland and residential areas	Y
gilded flicker	<i>Colaptes chrysoides</i>	BCC	SE	Nests and forages in desert riparian, desert wash and Joshua tree woodland	Y
golden eagle	<i>Aquila chrysaetos</i> (nesting & wintering)	BCC	CDF; WL; FP	Nests and winters in hilly, open/semi-open areas, including shrublands, grasslands, pastures, riparian areas, mountainous canyon land, open desert rimrock terrain; nests in large trees and on cliffs in open areas	B/W
gray vireo	<i>Vireo vicinior</i> (nesting)	BLM; BCC	SSC	Nests and forages in pinyon-juniper woodland, oak, and chamise and redshank chaparral	B
gray-headed junco	<i>Junco hyemalis caniceps</i> (nesting)	None	WL	Nests and forages in pine and juniper-pine forests	B
great blue heron	<i>Ardea herodias</i> (nesting colony)	None	CDF	Nests in large trees or snags; forages in wetlands, water bodies, water courses, and opportunistically in uplands, including pasture and croplands	Y
great egret	<i>Ardea alba</i> (nesting colony)	None	CDF	Nests and roosts in large trees over water or on islands, both in freshwater and marine estuarine habitats; forages in wetlands, including marshes, streams, ditches and fish-rearing ponds, but also in irrigated pastures and croplands	W
hepatic tanager	<i>Piranga flava</i> (nesting)	None	WL	Nests and forages in white-fir-pinyon forest, open woods, woodland edges and scattered trees in open areas	B
Lawrence's goldfinch	<i>Spinus lawrencei</i> (nesting)	BCC	None	Nests and forages in open oak, arid woodlands and chaparral near water	W
Le Conte's thrasher	<i>Toxostoma lecontei</i>	BCC	SSC	Nests and forages in desert wash, desert scrub, alkali desert scrub, desert succulent, and Joshua tree; nests in spiny shrubs or cactus	Y

APPENDIX 4A-4B (Continued)

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
least Bell's vireo	<i>Vireo bellii pusillus</i> (nesting)	FE	SE	Nests and forages in low, dense riparian thickets along water or along dry parts of intermittent streams; forages in riparian and adjacent shrubland late in nesting season	B
least bittern	<i>Ixobrychus exilis</i> (nesting)	BCC	SSC	Nests in freshwater and brackish marshes with dense, tall growths of aquatic and semi-aquatic vegetation	Y
Lewis' woodpecker	<i>Melanerpes lewis</i> (nesting)	BCC	None	Winters in open oak woodland and savanna; breeds in open ponderosa pine forest, and logged or burned pine forest	NB
loggerhead shrike	<i>Lanius ludovicianus</i> (nesting)	BBC	SSC	Nests and forages in open habitats with scattered shrubs, trees, or other perches	Y
long-billed curlew	<i>Numenius americanus</i> (nesting)	BCC	WL	Nests in grazed, mixed grass, and short-grass prairies. Localized nesting along the California coast; winters and forages in coastal estuaries, mudflats, open grassland and cropland	W (SW CORNER)
long-eared owl	<i>Asio otus</i> (nesting)	None	SSC	Nests in riparian habitat, live oak thickets, other dense stands of trees, edges of coniferous forest; forages in nearby open habitats	Y/W
Lucy's warbler	<i>Oreothlypis luciae</i> (nesting)	BCC	SSC	Nests and forages in desert wash and desert riparian habitats, especially dominated by mesquite, but also in other shrubs and tamarisk	B
merlin	<i>Falco columbarius</i> (wintering)	None	WL	Forages in semi-open areas used for foraging, including coastline, grassland, agriculture, savanna, woodland, lakes, and wetlands	W
mountain plover	<i>Charadrius montanus</i> (wintering)	Proposed FT; BLM; BBC	SSC	Winters in shortgrass prairies, plowed fields, open sagebrush and sandy deserts	W
northern cardinal	<i>Cardinalis cardinalis</i>	None	WL	Nests and forages in dense riparian and desert scrub along lower Colorado River	Y (probably extirpated)
northern goshawk	<i>Accipiter gentilis</i> (nesting)	BLM	CDF; SSC	Nests primarily in middle and higher elevation dense conifer forests; winters at lower elevations along coast, foothills and northern deserts in riparian and pinyon-juniper woodland	B/W
northern harrier	<i>Circus cyaneus</i> (nesting)	None	SSC	Nests in open wetlands including marshy meadows, wet lightly-grazed pastures, old fields, freshwater and brackish marshes, but also in drier habitats such as grassland and grain fields; forages in variety of habitats, including grassland, scrubs, rangelands, emergent wetlands, and other open habitats	W

APPENDIX 4A-4B (Continued)

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
Nuttall's woodpecker	<i>Picoides nuttallii</i> (nesting)	BCC	None	Nests and forages in low-elevation riparian forests and oak woodlands	Y
olive-sided flycatcher	<i>Contopus cooperi</i> (nesting)	BCC	SSC	Nests in mixed conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir, lodgepole pine; usually close to water	B
osprey	<i>Pandion haliaetus</i> (nesting)	None	WL; CDF	Large waters (lakes, reservoirs, rivers) supporting fish; usually near forest habitats, but widely observed along the coast	W (SW CORNER)
prairie falcon	<i>Falco mexicanus</i> (nesting)	BCC	WL	Forages in grassland, savanna, rangeland, agriculture, desert scrub, alpine meadows; nest on cliffs or bluffs	Y
purple martin	<i>Progne subis</i> (nesting)	None	SSC	Nest and forages in woodland habitats including riparian, coniferous, and valley foothill and montane woodlands; in the Sacramento region often nests in weep holes under elevated freeways	B
rufous hummingbird	<i>Selasphorus rufus</i> (nesting)	BCC	None	Does not nest in California; migrates through a wide variety of habitats including coastal scrub, valley foothill hardwood, and valley foothill riparian habitats, and residential areas with feeders	M
sharp-shinned hawk	<i>Accipiter striatus</i> (nesting)	None	WL	Nests in coniferous forests, ponderosa pine, black oak, riparian deciduous, mixed conifer, Jeffrey pine; winters in lowland woodlands and other habitats	W (LOCAL)
Sonoran yellow warbler	<i>Setophaga petechia sonorana</i> (nesting)	BCC	SSC	Nests and forages in willow and riparian habitats along Colorado River	B
southern California rufous-crowned sparrow	<i>Aimophila ruficeps canescens</i>	None	WL	Nests and forages open scrub and chaparral with low cover of scattered scrub interspersed with rocky and grassy patches	Y
southwestern willow flycatcher	<i>Empidonax traillii extimus</i> (nesting)	FE	SE	Nests in dense riparian habitats along streams, reservoirs, or wetlands; uses variety of riparian and shrubland habitats during migration	B
summer tanager	<i>Piranga rubra</i> (nesting)	None	SSC	Nests and forages in mature desert riparian habitats dominated by cottonwoods and willows	B
Swainson's hawk	<i>Buteo swainsoni</i> (nesting)	BCC; USFS	ST	Nests in open woodland and savanna, riparian and in isolated large trees; forages in nearby grasslands and agricultural areas such as wheat and alfalfa fields and pasture	B
tricolored blackbird	<i>Agelaius tricolor</i> (nesting colony)	BLM; BCC	SSC	Nests near fresh water, emergent wetland with cattails or tules, but also in Himalayan blackberry; forages in grasslands, woodland, and agriculture	Y

APPENDIX 4A-4B (Continued)

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
vermillion flycatcher	<i>Pyrocephalus rubinus</i> (nesting)	None	SSC	Nests in riparian woodlands, riparian scrub, and freshwater marshes; typical desert riparian with cottonwood, willow, mesquite adjacent to irrigated fields, ditches or pastures	Y
Virginia's warbler	<i>Oreothlypis virginiae</i> (nesting)	BBC	WL	Nests and forages in arid, shrubby mixed conifer, pinyon-juniper, montane chaparral, and montane riparian habitats	B
western snowy plover	<i>Charadrius alexandrinus nivosus</i> (nesting)	FT (Coastal population only); BCC	SSC (Interior population only)	Sandy marine and estuarine shores; in the interior breed on sandy, barren or sparsely vegetated flats near saline or alkaline lakes, reservoirs, and ponds	S (LOCAL)
western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i> (nesting)	FC; USFS; BCC	SE	Nests dense, wide riparian woodlands and forest with well-developed understories	B
white-faced ibis	<i>Plegadis chihi</i> (nesting colony)	None	WL	Nests in shallow marshes with areas of emergent vegetation; winter foraging in shallow lacustrine waters, flooded agricultural fields, muddy ground of wet meadows, marshes, ponds, lakes, rivers, flooded fields and estuaries	B/W
White-headed woodpecker	<i>Picoides albolarvatus</i> (nesting)	BCC	None	Nests and forages in coniferous forests with lodgepole pine and red fir; semi-open areas with large trees and 40-70% cover	Y
white-tailed kite	<i>Elanus leucurus</i> (nesting)	None	FP	Nests in woodland, riparian, and individual trees near open lands; forages opportunistically in grassland, meadows, scrubs, agriculture, emergent wetland, savanna, and disturbed lands	Y
yellow warbler	<i>Setophaga</i> [= <i>Dendroica</i>] <i>petechia brewsteri</i> (nesting)	BBC	SSC	Nests and forages in riparian and oak woodlands, montane chaparral, open ponderosa pine and mixed conifer habitats	B/W
yellow-breasted chat	<i>Icteria virens</i> (nesting)	None	SSC	Nests and forages in dense, relatively wide riparian woodlands and thickets of willows, vine tangles and dense brush	B
yellow-headed blackbird	<i>Xanthocephalus</i> <i>xanthocephalus</i> (nesting)	None	SSC	Nests in marshes with tall emergent vegetation, often along borders of lakes and ponds; forages in emergent wetlands, open areas, croplands, and muddy shores of lacustrine habitat	B

APPENDIX 4A-4B (Continued)

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
Yuma clapper rail	<i>Rallus longirostris yumanensis</i>	FE	ST; FP	Freshwater marsh dominated by cattail, bulrush and with a mix of riparian tree and shrub species along the marsh edge; many occupied areas are now manmade such as managed ponds or effluent-supported marshes	Y (COLORADO RIVER)
<i>Mammals</i>					
American badger	<i>Taxidea taxus</i>	None	SSC	Dry, open, treeless areas; grasslands, coastal scrub, agriculture, pastures, especially with friable soils	Y
Arizona Myotis	<i>Myotis occultus</i>	None	SSC	Conifer forests 6,000-9,000 ft elevation, but nursery sites at lower elevation along lower Colorado River, roosts in buildings, tree snags; forages in riparian, orchards, permanent water at lower elevations and ponds in forest clearings at higher elevations	X (southeastern portion)
California leaf-nosed bat	<i>Macrotus californicus</i>	BLM, USFS	SSC	Riparian woodlands, desert wash, desert scrub; roosts in mines and caves, occasionally buildings	Y (Eastern Mojave)
cave myotis	<i>Myotis velifer</i>	BLM	SSC	Creosote bush scrub, palo verde, brittlebush, and cactus; roosts in crevices in caves, mines, occasionally buildings and bridges; forages in riparian and desert wash	Y
Colorado River cotton rat	<i>Sigmodon arizonae plenus</i>	None	SSC	Moist riverine habitats along the Colorado River floodplain	Y
fringed myotis	<i>Myotis thysanodes</i>	BLM	None	Primarily drier woodlands, including oak, pinyon-juniper, ponderosa pine, and also desert scrub, mesic coniferous forest, grassland, and sage-grass steppe from sea level to 9,350 ft; roosts in crevices in buildings, mines, rocks, cliff faces, and bridges, and large, decadent trees and snags	Y
hoary bat	<i>Lasiurus cinereus</i>	None	None	Forest, woodland riparian, and wetland habitats, also juniper scrub, riparian forest, and desert scrub in arid areas; roosts in tree foliage and sometimes cavities, such as woodpecker holes	Y
long-eared myotis	<i>Myotis evotis</i>	BLM	None	Nearly all brush, woodland, and forest habitats from sea level to 9,000 ft, but prefers coniferous habitats; forages along habitat edges, in open habitats, and over water; roosts in buildings, crevices, under bark, and snags; caves are used as night roosts	Y
Los Angeles pocket mouse	<i>Perognathus longimembris brevinasus</i>	USFS	SSC	Lower elevation grassland, alluvial sage scrub, and coastal scrub	Y

APPENDIX 4A-4B (Continued)

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
Mohave ground squirrel	<i>Xerospermophilus mohavensis</i>	None	ST	Desert scrub habitats including those dominated by creosote bush and burrobush, desert sink scrub, and desert saltbush scrub	Y
Mohave river vole	<i>Microtus californicus mohavensis</i>	None	SSC	Wet, weedy, herbaceous areas along the Mojave River	Y
mountain lion	<i>Puma concolor</i>	None	None	Scrubs, chaparral, riparian, woodland, forest; rests in rocky area, and on cliffs and ledges that provide cover; most abundant in riparian area and brushy stages of most habitats throughout California, except deserts	Y
Nelson's bighorn sheep	<i>Ovis canadensis nelsoni</i>	BLM; USFS	None	Steep slopes and cliffs, rough and rocky topography, sparse vegetation; also canyons, washes and alluvial fans	Y
northwestern San Diego pocket mouse	<i>Chaetodipus fallax fallax</i>	None	SSC	Coastal scrub, mixed chaparral, sagebrush, desert wash, desert scrub, desert succulent shrub, pinyon-juniper, and annual grassland	Y
pallid bat	<i>Antrozous pallidus</i>	BLM, USFS	SSC	Grasslands, shrublands, woodlands, forests; most common in open dry habitats with rocky outcrops for roosting, but also roosts in manmade structures and trees	Y
pallid San Diego pocket mouse	<i>Chaetodipus fallax pallidus</i>	None	SSC	Desert wash, desert scrub, desert succulent scrub and pinyon-juniper woodland	Y
Pocketed free-tailed bat	<i>Nyctinomops femorosaccus</i>	None	SSC	Pinyon-juniper woodlands, desert scrub, desert succulent shrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, palm oases; roosts in high cliffs or rock outcrops with dropoffs, caverns, buildings	Y
ringtail	<i>Bassariscus astutus</i>	None	FP	Mixed forests and shrublands near rocky area or riparian habitats; forages near water and is seldom found more than 0.62 mile from a water source	Y
San Bernardino flying squirrel	<i>Glaucomys sabrinus californicus</i>	USFS	SSC	Coniferous and deciduous forests including riparian forests	Y
San Bernardino kangaroo rat	<i>Dipodomys merriami parvus</i>	FE	SSC	Sparse scrub habitat, alluvial scrub/coastal scrub habitats on gravelly and sandy soils near river and stream terraces	Y
Stephens' kangaroo rat	<i>Dipodomys stephensi</i>	FE	ST	Annual and perennial grassland habitats, coastal scrub or sagebrush with sparse canopy cover or in disturbed areas	
San Diego black-tailed jackrabbit	<i>Lepus californicus bennettii</i>	None	SSC	Arid habitats with open ground; grasslands, coastal scrub, agriculture, disturbed area, and rangelands	Y

APPENDIX 4A-4B (Continued)

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
San Diego desert woodrat	<i>Neotoma lepida intermedia</i>	None	SSC	Coastal scrub, desert scrub, chaparral, cacti, rocky areas	Y
southern grasshopper mouse	<i>Onychomys torridus ramona</i>	None	SSC	Grassland and sparse coastal scrub	Y
southwestern river otter	<i>Lontra canadensis sonora</i>	None	SSC	Riparian habitat along streams and rivers with sufficient prey	Y
spotted bat	<i>Euderma maculatum</i>	BLM	SSC	Foothills, mountains, desert regions of Southern California, including arid deserts, grasslands, and mixed conifer forests; roosts in rock crevices and cliffs; feeds over water and along washes	Y
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM, USFS	SSC	Mesic habitats characterized by coniferous and deciduous forests and riparian habitat, but also xeric areas; roosts in limestone caves and lava tubes, also man-made structures and tunnels	Y
western mastiff bat	<i>Eumops perotis californicus</i>	BLM	SSC	Chaparral, coastal and desert scrub, coniferous and deciduous forest and woodland; roosts in crevices in rocky canyons and cliffs where the canyon or cliff is vertical or nearly vertical, trees and tunnels	Y
western red bat	<i>Lasiurus blossevillii</i>	USFS	SSC	Forest, woodland, riparian, mesquite bosque and orchards, including fig, apricot, peach, pear, almond, walnut, and orange; roosts in tree canopy	Y (Colorado River)
western small-footed myotis	<i>Myotis ciliolabrum</i>	BLM	None	Arid woodlands and shrublands, but near water; roosts in caves, crevices, mines, abandoned buildings	Y
western yellow bat	<i>Lasiurus xanthinus</i>	None	SSC	Valley foothill riparian, desert riparian, desert wash, and palm oasis habitats; below 2,000 ft; roost in riparian and palms	Y (southern edge)
white-eared pocket mouse	<i>Perognathus alticolus alticolus</i>	BLM; USFS	SSC	Arid ponderosa pine communities	Y
Yuma myotis	<i>Myotis yumanensis</i>	BLM	None	Riparian, arid scrublands and deserts, and forests associated with water (streams, rivers, tinajas); roosts in bridges, buildings, cliff crevices, caves, mines, and trees;	Y
<i>Fish</i>					
Amargosa Canyon speckled dace	<i>Rhinichthys osculus ssp. 1</i>	BLM	SSC	Great Basin flowing waters	Y
Amargosa pupfish	<i>Cyprinodon nevadensis amargosae</i>	BLM	SSC	Great Basin flowing waters	Y

APPENDIX 4A-4B (Continued)

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
arroyo chub	<i>Gila orcuttii</i>	USFS	SSC	Slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates. Native to streams from Malibu Cr to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mohave, and San Diego river basins.	Y
bonytail	<i>Gila elegans</i>	FE	SE	Adapted for swimming in swift water, but both adults & young need backwaters & eddies. Needs gravel riffles for spawning. Found in the Colorado River bordering California.	Y
Colorado pikeminnow	<i>Ptychocheilus lucius</i>	FE	SE	Colorado River basin flowing waters	Y
Mohave tui chub	<i>Siphateles bicolor mohavensis</i>	FE	SE	Needs deep pools, ponds, or slough-like areas. Needs vegetation for spawning. Endemic to the Mojave River basin, adapted to alkaline, mineralized waters.	Y
razorback sucker	<i>Xyrauchen texanus</i>	FE	SE	Adapted for swimming in swift currents but also need quiet waters. Spawn in areas of sand/gravel/rocks in shallow water. Found in the Colorado River bordering California.	Y
Santa Ana speckled dace	<i>Rhinichthys osculus ssp. 3</i>	USFS	SSC	South coast flowing waters	Y
Santa Ana sucker	<i>Catostomus santaanae</i>	FT	SSC	Habitat generalists, but prefer sand-rubble-boulder bottoms, cool, clear water, & algae. Endemic to Los Angeles Basin south coastal streams.	Y
Saratoga Springs pupfish	<i>Cyprinodon nevadensis nevadensis</i>	None	SSC	Flowing and standing waters of the Great Basin	Y
unarmored threespine stickleback	<i>Gasterosteus aculeatus williamsoni</i>	FE	SE, FP	South coast flowing waters	Y (probably extirpated)
<i>Invertebrates</i>					
alkali skipper	<i>Pseudocopae odes eunus eunus</i>	None	None	Grassy spots on alkali flats; playa/salt flats	Y
Delhi Sands flower-loving fly	<i>Rhaphiomidas terminatus abdominalis</i>	FE	None	Delhi fine sandy soils and dunes, scrub and ruderal vegetation in the sand verbena series with <50% cover	Y
quino checkerspot butterfly	<i>Euphydryas editha quino</i>	FE	None	Patchy shrub or small tree landscapes; scrublands	Y
San Emigdio blue butterfly	<i>Plebulina emigdionis</i>	USFS	None	Near streambeds, washes, or alkaline areas; associated with <i>Atriplex canescens</i> and <i>A. lentiformis</i>	Y

APPENDIX 4A-4B (Continued)

Wildlife Species Known to Occur in San Bernardino County

Common Name	Scientific Name	Federal Status	State Status	Habitat	Status in San Bernardino County
San Gabriel Mountains blue butterfly	<i>Plebejus saepiolus aureolus</i>	USFS	None	Wet meadow seep in yellow pine forest	Y
San Gabriel Mountains elfin butterfly	<i>Callophrys mossii hidakupa</i>	USFS	None	Endemic to San Gabriel and San Bernardino Mountains at elevations of 3,000 to 5,000 ft; southern mixed evergreen forest; foodplant is <i>Sedum spathulifolium</i>	Y

Status Abbreviations

FE	Federally Endangered
FT	Federally Threatened
FC	Federal Candidate
BCC	U.S. Fish and Wildlife Service Bird of Conservation Concern
BLM	Bureau of Land Management Sensitive Species
USFS	U.S. Forest Service Sensitive Species
SSC	California Species of Special Concern
FP	California Fully Protected Species
WL	California Watch List Species
SE	State Endangered
ST	State Threatened

Occurrence Abbreviations

Y	Known or expected to occur as resident
W	Known or expected to occur during winter
B	Known or expected occur as breeder
Y/NB	Known or expected to occur both as breeding resident as non-breeder
NB	Known or expected to occur as non-breeder
B/W	Known or expected to occur both as breeder and winterer
Y/W	Known or expected to occur as resident and winterer
M	Occurs in migration only

APPENDIX 4A-4B (Continued)

APPENDIX 4-B

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Abronia nana</i> var. <i>covillei</i>	Coville's dwarf abronia	None/ None/ 4.2	Great Basin scrub, Joshua tree "woodland", Pinyon and juniper woodland, Subalpine coniferous forest, Upper montane coniferous forest/carbonate, sandy/ perennial herb/ May-Aug/ 5000-10171
<i>Abronia villosa</i> var. <i>aurita</i>	chaparral sand- verbena	None/ None/ 1B.1	Chaparral, Coastal scrub, Desert dunes/sandy/ annual herb/ Jan-Sep/ 246-5249
<i>Abutilon parvulum</i>	dwarf abutilon	None/ None/ 2.3	Chenopod scrub(rocky)/ perennial herb/ Apr-May/ 2953-4265
<i>Acanthoscyphus parishii</i> var. <i>cienegeensis</i>	Cienega Seca oxytheca	None/ None/ 1B.3	Joshua tree "woodland", Pinyon and juniper woodland, Upper montane coniferous forest(sandy, granitic)/ annual herb/ Jun-Sep/ 6906-8038
<i>Acanthoscyphus parishii</i> var. <i>goodmaniana</i>	Cushenbury oxytheca	FE/ None/ 1B.1	Pinyon and juniper woodland(carbonate, talus)/sandy, carbonate/ annual herb/ May-Oct/ 3999-7799
<i>Acanthoscyphus parishii</i> var. <i>parishii</i>	Parish's oxytheca	None/ None/ 4.2	Chaparral, Lower montane coniferous forest/sandy or gravelly/ annual herb/ Jun-Sep/ 4003-8530
<i>Acleisanthes nevadensis</i>	desert wing-fruit	None/ None/ 2.3	Joshua tree "woodland", Mojavean desert scrub/rocky, gravelly/ perennial herb/ Apr-Sep/ 2608-4101
<i>Acmispon argyraeus</i> var. <i>multicaulis</i>	scrub lotus	None/ None/ 1B.3	Pinyon and juniper woodland(granitic)/ perennial herb/ Apr-Jun/ 3937-4921
<i>Acmispon argyraeus</i> var. <i>notitius</i>	Providence Mountains lotus	None/ None/ 1B.3	Pinyon and juniper woodland/ perennial herb/ May-Aug/ 3937-6562
<i>Agave utahensis</i> var. <i>nevadensis</i>	Clark Mountain agave	None/ None/ 4.2	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/carbonate or volcanic/ perennial leaf succulent/ May-Jul/ 2953-5200
<i>Ageratina herbacea</i>	desert ageratina	None/ None/ 2.3	Pinyon and juniper woodland(rocky)/ perennial herb/ Jul-Oct/ 5003-7218
<i>Aliciella ripleyi</i>	Ripley's aliciella	None/ None/ 2.3	Mojavean desert scrub(carbonate)/ perennial herb/ May-Jul/ 1001-6398
<i>Aliciella triodon</i>	coyote gilia	None/ None/ 2.3	Great Basin scrub, Pinyon and juniper woodland/sometimes sandy/ annual herb/ Apr-Jun/ 2001-5577
<i>Allium atrorubens</i> var. <i>atorubens</i>	Great Basin onion	None/ None/ 2.3	Great Basin scrub, Pinyon and juniper woodland/rocky or sandy/ perennial bulbiferous herb/ May-Jun/ 3937-7595
<i>Allium atrorubens</i> var. <i>cristatum</i>	Inyo onion	None/ None/ 4.3	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/sandy or rocky/ perennial bulbiferous herb/ Apr-Jun/ 3937-8399
<i>Allium marvinii</i>	Yucaipa onion	None/ None/ 1B.1	Chaparral(clay, openings)/ perennial bulbiferous herb/ Apr-May/ 2493-3494

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Allium nevadense</i>	Nevada onion	None/ None/ 2.3	Pinyon and juniper woodland(sandy or gravelly)/ perennial bulbiferous herb/ Apr-May/ 2657-5577
<i>Allium parishii</i>	Parish's onion	None/ None/ 4.3	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/rocky/ perennial bulbiferous herb/ Apr-May/ 2953-4806
<i>Aloysia wrightii</i>	Wright's beebrush	None/ None/ 4.3	Joshua tree "woodland", Pinyon and juniper woodland/rocky, often carbonate/ perennial evergreen shrub/ Apr-Oct/ 2953-5249
<i>Amaranthus watsonii</i>	Watson's amaranth	None/ None/ 4.3	Mojavean desert scrub, Sonoran desert scrub/ annual herb/ Apr-Sep/ 66-5577
<i>Ambrosia monogyra</i>	singlewhorl burrobrush	None/ None/ 2.3	Chaparral, Sonoran desert scrub/sandy/ perennial shrub/ Aug-Nov/ 33-1640
<i>Androsace elongata</i> ssp. <i>acuta</i>	California androsace	None/ None/ 4.2	Chaparral, Cismontane woodland, Coastal scrub, Meadows and seeps, Pinyon and juniper woodland, Valley and foothill grassland/ annual herb/ Mar-Jun/ 492-3937
<i>Androstephium breviflorum</i>	small-flowered androstephium	None/ None/ 2.3	Desert dunes, Mojavean desert scrub (bajadas)/ perennial bulbiferous herb/ Mar-Apr/ 722-2625
<i>Antennaria marginata</i>	white-margined everlasting	None/ None/ 2.3	Lower montane coniferous forest, Upper montane coniferous forest/ perennial stoloniferous herb/ May-Aug/ 6955-11001
<i>Arctomecon merriamii</i>	white bear poppy	None/ None/ 2.3	Chenopod scrub, Mojavean desert scrub/rocky/ perennial herb/ Apr-May/ 1608-5906
<i>Arctostaphylos glandulosa</i> ssp. <i>gabrielensis</i>	San Gabriel manzanita	None/ None/ 1B.2	Chaparral(rocky)/ perennial evergreen shrub/ Mar/ 1952-4921
<i>Arctostaphylos parryana</i> ssp. <i>tumescens</i>	interior manzanita	None/ None/ 4.3	Chaparral(montane), Cismontane woodland/ perennial evergreen shrub/ Feb-Apr/ 6890-7579
<i>Arctostaphylos refugioensis</i>	Refugio manzanita	None/ None/ 1B.2	Chaparral(sandstone)/ perennial evergreen shrub/ Dec-Mar(May),/ 899-2690
<i>Arenaria lanuginosa</i> var. <i>saxosa</i>	rock sandwort	None/ None/ 2.3	Subalpine coniferous forest, Upper montane coniferous forest/mesic, sandy/ perennial herb/ Jul-Aug/ 5906-8530
<i>Arenaria paludicola</i>	marsh sandwort	FE/ SE/ 1B.1	Marshes and swamps (freshwater or brackish)/sandy, openings/ perennial stoloniferous herb/ May-Aug/ 10-558
<i>Argyrochosma limitanea</i> ssp. <i>limitanea</i>	southwestern false cloak-fern	None/ None/ 2.3	Pinyon and juniper woodland (carbonate, rocky)/ perennial rhizomatous herb/ Apr-Oct/ 5906-5906
<i>Asclepias asperula</i> ssp. <i>asperula</i>	antelope-horns	None/ None/ 4.3	Mojavean desert scrub, Pinyon and juniper woodland/rocky/ perennial herb/ May-Sep/ 3002-7201
<i>Asclepias nyctaginifolia</i>	Mojave milkweed	None/ None/ 2.3	Mojavean desert scrub, Pinyon and juniper woodland/ perennial herb/ May-Jun/ 2871-5577
<i>Asplenium vespertinum</i>	western spleenwort	None/ None/ 4.2	Chaparral, Cismontane woodland, Coastal scrub/rocky/ perennial rhizomatous herb/ Feb-Jun/ 591-3281

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Astragalus albens</i>	Cushenbury milk-vetch	FE/ None/ 1B.1	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/usually carbonate, rarely granitic/ perennial herb/ Mar-Jun/ 3593-6562
<i>Astragalus allochrous</i> var. <i>playanus</i>	playa milk-vetch	None/ None/ 2.3	Mojavean desert scrub(sandy)/ perennial herb/ Apr/ 2625-2625
<i>Astragalus bernardinus</i>	San Bernardino milk-vetch	None/ None/ 1B.2	Joshua tree "woodland", Pinyon and juniper woodland/Often granitic or carbonate/ perennial herb/ Apr-Jun/ 2953-6562
<i>Astragalus bicristatus</i>	crested milk-vetch	None/ None/ 4.3	Lower montane coniferous forest, Upper montane coniferous forest/sandy or rocky, mostly carbonate/ perennial herb/ May-Aug/ 5577-9006
<i>Astragalus cimae</i> var. <i>cimae</i>	Cima milk-vetch	None/ None/ 1B.2	Great Basin scrub, Joshua tree "woodland", Pinyon and juniper woodland/clay/ perennial herb/ Apr-May/ 2920-6070
<i>Astragalus hornii</i> var. <i>hornii</i>	Horn's milk-vetch	None/ None/ 1B.1	Meadows and seeps, Playas/lake margins, alkaline/ annual herb/ May-Oct/ 197-2789
<i>Astragalus insularis</i> var. <i>harwoodii</i>	Harwood's milk-vetch	None/ None/ 2.3	Desert dunes, Mojavean desert scrub/sandy or gravelly/ annual herb/ Jan-May/ 0-2329
<i>Astragalus jaegerianus</i>	Lane Mountain milk-vetch	FE/ None/ 1B.1	Joshua tree "woodland", Mojavean desert scrub/granitic, sandy or gravelly/ perennial herb/ Apr-Jun/ 2953-3937
<i>Astragalus lentiginosus</i> var. <i>antoniuis</i>	San Antonio milk-vetch	None/ None/ 1B.3	Lower montane coniferous forest, Upper montane coniferous forest/ perennial herb/ Apr-Jul/ 4921-8530
<i>Astragalus lentiginosus</i> var. <i>borreganus</i>	Borrego milk-vetch	None/ None/ 4.3	Mojavean desert scrub, Sonoran desert scrub/sandy/ annual herb/ Feb-May/ 98-1050
<i>Astragalus lentiginosus</i> var. <i>sierrae</i>	Big Bear Valley milk-vetch	None/ None/ 1B.2	Mojavean desert scrub, Meadows and seeps, Pinyon and juniper woodland, Upper montane coniferous forest/gravelly or rocky/ perennial herb/ Apr-Aug/ 5906-8530
<i>Astragalus leucolobus</i>	Big Bear Valley woollypod	None/ None/ 1B.2	Lower montane coniferous forest, Pebble plain, Pinyon and juniper woodland, Upper montane coniferous forest/rocky/ perennial herb/ May-Jul/ 5741-9465
<i>Astragalus nutans</i>	Providence Mountains milk-vetch	None/ None/ 4.3	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland, Sonoran desert scrub/sandy or gravelly/ annual herb/ Mar-Jun(Oct),/ 1476-6398
<i>Astragalus preussii</i> var. <i>laxiflorus</i>	Lancaster milk-vetch	None/ None/ 1B.1	Chenopod scrub/ perennial herb/ Mar-May/ 2297-2297
<i>Astragalus preussii</i> var. <i>preussii</i>	Preuss' milk-vetch	None/ None/ 2.3	Chenopod scrub, Mojavean desert scrub/clay/ perennial herb/ Apr-Jun/ 2461-2641
<i>Astragalus tidentromii</i>	Tidestrom's milk-vetch	None/ None/ 2.3	Mojavean desert scrub/carbonate, sandy or gravelly/ perennial herb/ (Jan),Apr-Jul/ 1969-5200

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Astragalus tricarinatus</i>	triple-ribbed milk-vetch	FE/ None/ 1B.2	Joshua tree "woodland", Sonoran desert scrub/sandy or gravelly/ perennial herb/ Feb-May/ 1476-3904
<i>Astrolepis cochisensis</i> ssp. <i>cochisensis</i>	scaly cloak fern	None/ None/ 2.3	Joshua tree "woodland", Pinyon and juniper woodland/carbonate/ perennial rhizomatous herb/ Apr-Oct/ 2953-5906
<i>Atriplex coulteri</i>	Coulter's saltbush	None/ None/ 1B.2	Coastal bluff scrub, Coastal dunes, Coastal scrub, Valley and foothill grassland/alkaline or clay/ perennial herb/ Mar-Oct/ 10-1509
<i>Atriplex parishii</i>	Parish's brittlescale	None/ None/ 1B.1	Chenopod scrub, Playas, Vernal pools/alkaline/ annual herb/ Jun-Oct/ 82-6234
<i>Ayenia compacta</i>	California ayenia	None/ None/ 2.3	Mojavean desert scrub, Sonoran desert scrub/rocky/ perennial herb/ Mar-Apr/ 492-3593
<i>Azolla microphylla</i>	Mexican mosquito fern	None/ None/ 4.2	Marshes and swamps(ponds, slow water)/ annual/perennial herb/ Aug/ 98-328
<i>Bahia neomexicana</i>	many-flowered bahia	None/ None/ 2.3	Pinyon and juniper woodland(sandy)/ annual herb/ Sep-Oct/ 4921-5577
<i>Berberis fremontii</i>	Fremont barberry	None/ None/ 3	Chaparral, Joshua tree "woodland", Pinyon and juniper woodland/rocky/ perennial evergreen shrub/ Apr-Jun/ 2756-6070
<i>Berberis harrisoniana</i>	Kofa Mountain barberry	None/ None/ 1B.2	Chaparral, Mojavean desert scrub/usually north-facing talus slopes, sometimes volcanic/ perennial evergreen shrub/ Jan-Mar/ 2559-2756
<i>Berberis nevini</i>	Nevin's barberry	FE/ SE/ 1B.1	Chaparral, Cismontane woodland, Coastal scrub, Riparian scrub/sandy or gravelly/ perennial evergreen shrub/ Mar-Jun/ 899-2707
<i>Blepharidachne kingii</i>	King's eyelash grass	None/ None/ 2.3	Great Basin scrub(usually carbonate)/ perennial herb/ May/ 3494-7005
<i>Boechera dispar</i>	pinyon rockcress	None/ None/ 2.3	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/granitic, gravelly/ perennial herb/ Mar-Jun/ 3937-8333
<i>Boechera lincolnensis</i>	Lincoln rockcress	None/ None/ 2.3	Chenopod scrub, Mojavean desert scrub/carbonate/ perennial herb/ Mar-May/ 3609-8875
<i>Boechera parishii</i>	Parish's rockcress	None/ None/ 1B.2	Pebble plain, Pinyon and juniper woodland, Upper montane coniferous forest/rocky, quartzite on clay, or sometimes carbonate/ perennial herb/ Apr-May/ 5807-9810
<i>Boechera peirsonii</i>	San Bernardino rockcress	None/ None/ 1B.2	Subalpine coniferous forest(rocky)/ perennial herb/ Mar-Aug/ 8858- 10499
<i>Boechera shockleyi</i>	Shockley's rockcress	None/ None/ 2.3	Pinyon and juniper woodland(carbonate or quartzite, rocky or gravelly)/ perennial herb/ May-Jun/ 2871-7579
<i>Botrychium crenulatum</i>	scalloped moonwort	None/ None/ 2.3	Bogs and fens, Lower montane coniferous forest, Meadows and seeps, Marshes and swamps(freshwater), Upper montane coniferous forest/ perennial rhizomatous herb/ Jun-Sep/ 4160-10761
<i>Botrychium minganense</i>	Mingan moonwort	None/ None/ 2.3	Bogs and fens, Lower montane coniferous forest, Upper montane coniferous forest/Mesic/ perennial rhizomatous herb/ Jul-Sep/ 4774- 6906
<i>Bouteloua eriopoda</i>	black grama	None/ None/ 4.2	Joshua tree "woodland", Pinyon and juniper woodland/ perennial stoloniferous herb/ May-Aug/ 2953-6234

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Bouteloua trifida</i>	three-awned grama	None/ None/ 2.3	Mojavean desert scrub(carbonate, rocky)/ perennial herb/ May-Sep/ 2297-6562
<i>Brodiaea filifolia</i>	thread-leaved brodiaea	FT/ SE/ 1B.1	Chaparral(openings), Cismontane woodland, Coastal scrub, Playas, Valley and foothill grassland, Vernal pools/often clay/ perennial bulbiferous herb/ Mar-Jun/ 82-3675
<i>Calandrinia breweri</i>	Brewer's calandrinia	None/ None/ 4.2	Chaparral, Coastal scrub/sandy or loamy, disturbed sites and burns/ annual herb/ Mar-Jun/ 33-4003
<i>Calochortus catalinae</i>	Catalina mariposa lily	None/ None/ 4.2	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland/ perennial bulbiferous herb/ (Feb),Mar-Jun/ 49-2297
<i>Calochortus palmeri</i> var. <i>palmeri</i>	Palmer's mariposa lily	None/ None/ 1B.2	Chaparral, Lower montane coniferous forest, Meadows and seeps/mesic/ perennial bulbiferous herb/ Apr-Jul/ 3281-7841
<i>Calochortus plummerae</i>	Plummer's mariposa lily	None/ None/ 4.2	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland/granitic, rocky/ perennial bulbiferous herb/ May-Jul/ 328-5577
<i>Calochortus striatus</i>	alkali mariposa lily	None/ None/ 1B.2	Chaparral, Chenopod scrub, Mojavean desert scrub, Meadows and seeps/alkaline, mesic/ perennial bulbiferous herb/ Apr-Jun/ 230-5233
<i>Calochortus weedii</i> var. <i>intermedius</i>	intermediate mariposa lily	None/ None/ 1B.2	Chaparral, Coastal scrub, Valley and foothill grassland/rocky, calcareous/ perennial bulbiferous herb/ May-Jul/ 344-2805
<i>Calyptridium pygmaeum</i>	pygmy pussypaws	None/ None/ 1B.2	Subalpine coniferous forest, Upper montane coniferous forest/sandy or gravelly/ annual herb/ Jun-Aug/ 6496-10203
<i>Calystegia felix</i>	lucky morning-glory	None/ None/ 3.1	Historically associated with wetland and marshy places, but possibly in drier situations as well. Possibly silty loam and alkaline, Meadows and seeps (sometimes alkaline), Riparian scrub (alluvial)/ annual rhizomatous herb/ Mar-Sept/ 98-705
<i>Calystegia sepium</i> ssp. <i>binghamiae</i>	Santa Barbara morning-glory	None/ None/ 1B.1	Marshes and swamps(coastal), Riparian scrub(alluvial)/Historically associated with wetland and marshy places, but possibly in drier situations as well. P/ perennial rhizomatous herb/ Apr-May/ 0-722
<i>Canbya candida</i>	white pygmy-poppy	None/ None/ 4.2	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/gravelly, sandy, granitic/ annual herb/ Mar-Jun/ 1969-4790
<i>Carex comosa</i>	bristly sedge	None/ None/ 2.3	Coastal prairie, Marshes and swamps(lake margins), Valley and foothill grassland/ perennial rhizomatous herb/ May-Sep/ 0-2051
<i>Carex occidentalis</i>	western sedge	None/ None/ 2.3	Lower montane coniferous forest, Meadows and seeps/ perennial rhizomatous herb/ Jun-Aug/ 5397-10285
<i>Carnegiea gigantea</i>	saguaro	None/ None/ 2.3	Sonoran desert scrub(rocky)/ perennial stem succulent/ May-Jun/ 164-4921
<i>Castela emoryi</i>	Emory's crucifixion-thorn	None/ None/ 2.3	Mojavean desert scrub, Playas, Sonoran desert scrub/gravelly/ perennial deciduous shrub/ (Apr),Jun-Jul(Sep),(Oct),/ 295-2198
<i>Castilleja cinerea</i>	ash-gray paintbrush	FT/ None/ 1B.2	Mojavean desert scrub, Meadows and seeps, Pebble plain, Pinyon and juniper woodland, Upper montane coniferous forest(clay openings)/ perennial herb hemiparasitic/ Jun-Aug/ 5906-9711

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Castilleja lasiorhyncha</i>	San Bernardino Mountains owl's-clover	None/ None/ 1B.2	Chaparral, Meadows and seeps, Pebble plain, Riparian woodland, Upper montane coniferous forest/mesic/ annual herb hemiparasitic/ May-Aug/ 4265-7841
<i>Castilleja montigena</i>	Heckard's paintbrush	None/ None/ 4.3	Lower montane coniferous forest, Pinyon and juniper woodland, Upper montane coniferous forest/ perennial herb hemiparasitic/ May-Aug/ 6398-9186
<i>Castilleja plagiotoma</i>	Mojave paintbrush	None/ None/ 4.3	Great Basin scrub(alluvial), Joshua tree "woodland", Lower montane coniferous forest, Pinyon and juniper woodland/ perennial herb hemiparasitic/ Apr-Jun/ 984-8202
<i>Centromadia pungens</i> ssp. <i>laevis</i>	smooth tarplant	None/ None/ 1B.1	Chenopod scrub, Meadows and seeps, Playas, Riparian woodland, Valley and foothill grassland/alkaline/ annual herb/ Apr-Sep/ 0-2100
<i>Chamaesyce abramsiana</i>	Abrams' spurge	None/ None/ 2.3	Mojavean desert scrub, Sonoran desert scrub/sandy/ annual herb/ (Aug),Sep-Nov/ -16-3002
<i>Chamaesyce parryi</i>	Parry's spurge	None/ None/ 2.3	Desert dunes, Mojavean desert scrub(sandy)/ annual herb/ May-Nov/ 1296-2395
<i>Chamaesyce platysperma</i>	flat-seeded spurge	None/ None/ 1B.2	Desert dunes, Sonoran desert scrub(sandy)/ annual herb/ Feb-Sep/ 213-328
<i>Chamaesyce revoluta</i>	revolute spurge	None/ None/ 4.3	Mojavean desert scrub(rocky)/ annual herb/ Aug-Sep/ 3593-10171
<i>Chamaesyce vallis-mortae</i>	Death Valley sandmat	None/ None/ 4.2	Mojavean desert scrub(sandy or gravelly)/ perennial herb/ May-Oct/ 755-4790
<i>Cheilanthes wootonii</i>	Wooton's lace fern	None/ None/ 2.3	Joshua tree "woodland", Pinyon and juniper woodland/rocky/ perennial rhizomatous herb/ May-Oct/ 5249-6234
<i>Chloropyron maritimum</i> ssp. <i>maritimum</i>	salt marsh bird's-beak	FE/ SE/ 1B.2	Coastal dunes, Marshes and swamps(coastal salt)/ annual herb hemiparasitic/ May-Oct/ 0-98
<i>Chloropyron tecopense</i>	Tecopa bird's-beak	None/ None/ 1B.2	Mojavean desert scrub, Meadows and seeps/Mesic, alkaline/ annual herb hemiparasitic/ Jul-Oct/ 197-2953
<i>Chorizanthe leptotheca</i>	Peninsular spineflower	None/ None/ 4.2	Chaparral, Coastal scrub, Lower montane coniferous forest/alluvial fan, granitic/ annual herb/ May-Aug/ 984-6234
<i>Chorizanthe parryi</i> var. <i>parryi</i>	Parry's spineflower	None/ None/ 1B.1	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland/sandy or rocky, openings/ annual herb/ Apr-Jun/ 902-4003
<i>Chorizanthe spinosa</i>	Mojave spineflower	None/ None/ 4.2	Chenopod scrub, Joshua tree "woodland", Mojavean desert scrub, Playas/Sometimes alkaline/ annual herb/ Mar-Jul/ 20-4265
<i>Chorizanthe xanti</i> var. <i>leucotheca</i>	white-bracted spineflower	None/ None/ 1B.2	Coastal scrub(alluvial fans), Mojavean desert scrub, Pinyon and juniper woodland/sandy or gravelly/ annual herb/ Apr-Jun/ 984-3937
<i>Chylismia arenaria</i>	sand evening-primrose	None/ None/ 2.3	Sonoran desert scrub(sandy or rocky)/ annual/perennial herb/ Nov-May/ -230-3002
<i>Cirsium arizonicum</i> var. <i>tenuisectum</i>	desert mountain thistle	None/ None/ 1B.2	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/rocky, disturbed areas, often roadsides/ perennial herb/ Jun-Nov/ 4921-9186

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Cladium californicum</i>	California sawgrass	None/ None/ 2.3	Meadows and seeps, Marshes and swamps/Alkaline or Freshwater/ perennial rhizomatous herb/ Jun-Sep/ 197-2838
<i>Claytonia lanceolata</i> var. <i>peirsonii</i>	Peirson's spring beauty	None/ None/ 3.1	Subalpine coniferous forest, Upper montane coniferous forest/screel/ perennial herb/ May-Jun/ 7005-9006
<i>Cleomella brevipes</i>	short-pedicelled cleomella	None/ None/ 4.2	Meadows and seeps, Marshes and swamps, Playas/alkaline/ annual herb/ May-Oct/ 1296-7201
<i>Cordylanthus eremicus</i> ssp. <i>eremicus</i>	desert bird's-beak	None/ None/ 4.3	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/ annual herb hemiparasitic/ Jul-Oct/ 3281-9843
<i>Cordylanthus parviflorus</i>	small-flowered bird's-beak	None/ None/ 2.3	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/ annual herb hemiparasitic/ Aug-Oct/ 2297-7218
<i>Coryphantha alversonii</i>	foxtail cactus	None/ None/ 4.3	Mojavean desert scrub, Sonoran desert scrub/sandy or rocky, usually granitic/ perennial stem succulent/ Apr-Jun/ 246-5003
<i>Coryphantha chlorantha</i>	desert pincushion	None/ None/ 2.3	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/carbonate, gravelly, rocky/ perennial stem succulent/ Apr- Sep/ 148-5594
<i>Coryphantha vivipara</i> var. <i>rosea</i>	viviparous foxtail cactus	None/ None/ 2.3	Mojavean desert scrub, Pinyon and juniper woodland/carbonate/ perennial stem succulent/ May-Jun/ 4101-8858
<i>Cryptantha clokeyi</i>	Clokey's cryptantha	None/ None/ 1B.2	Mojavean desert scrub/ annual herb/ Apr/ 2379-4478
<i>Cryptantha costata</i>	ribbed cryptantha	None/ None/ 4.3	Desert dunes, Mojavean desert scrub, Sonoran desert scrub/sandy/ annual herb/ Feb-May/ -197-1640
<i>Cryptantha holoptera</i>	winged cryptantha	None/ None/ 4.3	Mojavean desert scrub, Sonoran desert scrub/ annual herb/ Mar-Apr/ 328-5545
<i>Cryptantha tumulosa</i>	New York Mountains cryptantha	None/ None/ 4.3	Mojavean desert scrub, Pinyon and juniper woodland/gravelly or clay, granitic or carbonate/ perennial herb/ Apr-Jun/ 3002-6988
<i>Cuscuta californica</i> var. <i>apiculata</i>	pointed dodder	None/ None/ 3	Mojavean desert scrub, Sonoran desert scrub/sandy/ annual vine parasitic/ Feb-Aug/ 0-1640
<i>Cuscuta obtusiflora</i> var. <i>glandulosa</i>	Peruvian dodder	None/ None/ 2.3	Marshes and swamps(freshwater)/ annual vine parasitic/ Jul-Oct/ 49- 919
<i>Cymopterus deserticola</i>	desert cymopterus	None/ None/ 1B.2	Joshua tree "woodland", Mojavean desert scrub/sandy/ perennial herb/ Mar-May/ 2067-4921
<i>Cymopterus gilmanii</i>	Gilman's cymopterus	None/ None/ 2.3	Mojavean desert scrub(often carbonate)/ perennial herb/ Apr-May/ 3002-6562
<i>Cymopterus multinervatus</i>	purple-nerve cymopterus	None/ None/ 2.3	Mojavean desert scrub, Pinyon and juniper woodland/sandy or gravelly/ perennial herb/ Mar-Apr/ 2592-5906
<i>Deinandra mohavensis</i>	Mojave tarplant	None/ SE/ 1B.3	Chaparral, Coastal scrub, Riparian scrub/mesic/ annual herb/ (May),Jun-Oct(Jan),/ 2100-5249

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Deinandra paniculata</i>	paniculate tarplant	None/ None/ 4.2	Coastal scrub, Valley and foothill grassland, Vernal pools/usually vernal mesic, sometimes sandy/ annual herb/ Apr-Nov/ 82-3084
<i>Delphinium scaposum</i>	bare-stem larkspur	None/ None/ 2.3	Sonoran desert scrub/rocky, sometimes washes/ perennial herb/ Mar-Apr/ 886-3461
<i>Digitaria californica</i> var. <i>californica</i>	Arizona cottontop	None/ None/ 2.3	Mojavean desert scrub, Sonoran desert scrub/rocky/ perennial herb/ Jul-Nov/ 951-4888
<i>Ditaxis claryana</i>	glandular ditaxis	None/ None/ 2.3	Mojavean desert scrub, Sonoran desert scrub/sandy/ perennial herb/ Oct-Mar/ 0-1526
<i>Ditaxis serrata</i> var. <i>californica</i>	California ditaxis	None/ None/ 3.2	Sonoran desert scrub/ perennial herb/ Mar-Dec/ 98-3281
<i>Dodecahema leptoceras</i>	slender-horned spineflower	FE/ SE/ 1B.1	Chaparral, Cismontane woodland, Coastal scrub(alluvial fan)/sandy/ annual herb/ Apr-Jun/ 656-2493
<i>Draba saxosa</i>	Southern California rock draba	None/ None/ 1B.3	Alpine boulder and rock field, Subalpine coniferous forest, Upper montane coniferous forest/rocky/ perennial herb/ Jun-Sep/ 8005-11811
<i>Drymocalis cuneifolia</i> var. <i>cuneifolia</i>	wedgeleaf woodbeauty	None/ None/ 1B.1	Riparian scrub, Upper montane coniferous forest/Sometimes carbonate/ perennial herb/ Jun-Aug/ 5906-7267
<i>Dryopteris filix-mas</i>	male fern	None/ None/ 2.3	Upper montane coniferous forest(granitic, rocky)/ perennial rhizomatous herb/ Jul-Sep/ 7874-10171
<i>Dudleya abramsii</i> ssp. <i>affinis</i>	San Bernardino Mountains dudleya	None/ None/ 1B.2	Pebble plain, Pinyon and juniper woodland, Upper montane coniferous forest/granitic, quartzite, or carbonate/ perennial herb/ Apr-Jul/ 4101-8530
<i>Dudleya multicaulis</i>	many-stemmed dudleya	None/ None/ 1B.2	Chaparral, Coastal scrub, Valley and foothill grassland/often clay/ perennial herb/ Apr-Jul/ 49-2592
<i>Echinocereus engelmannii</i> var. <i>howei</i>	Howe's hedgehog cactus	None/ None/ 1B.1	Mojavean desert scrub/ perennial stem succulent/ Apr-May/ 1411-2543
<i>Elymus salina</i>	Salina Pass wild-rye	None/ None/ 2.3	Pinyon and juniper woodland(rocky)/ perennial rhizomatous herb/ May-Jun/ 4429-7005
<i>Enceliopsis nudicaulis</i> var. <i>nudicaulis</i>	naked-stemmed daisy	None/ None/ 4.3	Great Basin scrub, Mojavean desert scrub/volcanic or carbonate/ perennial herb/ Apr-May/ 3117-6562
<i>Enneapogon desvauxii</i>	nine-awned pappus grass	None/ None/ 2.3	Pinyon and juniper woodland(rocky, carbonate)/ perennial herb/ Aug-Sep/ 4183-5988
<i>Eremogone congesta</i> var. <i>charlestonensis</i>	Charleston sandwort	None/ None/ 1B.3	Pinyon and juniper woodland(sandy)/ perennial herb/ Jun/ 7218-7300
<i>Eremogone ursina</i>	Big Bear Valley sandwort	FT/ None/ 1B.2	Meadows and seeps, Pebble plain, Pinyon and juniper woodland/mesic, rocky/ perennial herb/ May-Aug/ 5906-9514

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Eremothera boothii</i> ssp. <i>boothii</i>	Booth's evening-primrose	None/ None/ 2.3	Joshua tree "woodland", Pinyon and juniper woodland/ annual herb/ Apr-Sep/ 2674-7874
<i>Eremothera boothii</i> ssp. <i>intermedia</i>	Booth's hairy evening-primrose	None/ None/ 2.3	Great Basin scrub(sandy), Pinyon and juniper woodland/ annual herb/ (May),Jun/ 4921-7054
<i>Eriastrum densifolium</i> ssp. <i>sanctorum</i>	Santa Ana River woollystar	FE/ SE/ 1B.1	Chaparral, Coastal scrub(alluvial fan)/sandy or gravelly/ perennial herb/ Apr-Sep/ 299-2001
<i>Eriastrum harwoodii</i>	Harwood's eriastrum	None/ None/ 1B.2	Desert dunes/ annual herb/ Mar-Jun/ 410-3002
<i>Ericameria nana</i>	dwarf goldenbush	None/ None/ 4.3	Pinyon and juniper woodland(rocky, carbonate or granitic)/ perennial shrub/ Jul-Nov/ 4806-9186
<i>Erigeron breweri</i> var. <i>jacinteus</i>	San Jacinto Mountains daisy	None/ None/ 4.3	Subalpine coniferous forest, Upper montane coniferous forest/rocky/ perennial rhizomatous herb/ Jun-Sep/ 8858-9514
<i>Erigeron oxyphyllus</i>	wand-like fleabane daisy	None/ None/ 2.3	Sonoran desert scrub/dry, rocky slopes and washes/ perennial herb/ May/ 2116-2592
<i>Erigeron parishii</i>	Parish's daisy	FT/ None/ 1B.1	Mojavean desert scrub, Pinyon and juniper woodland/usually carbonate, sometimes granitic/ perennial herb/ May-Aug/ 2625-6562
<i>Erigeron uncialis</i> var. <i>uncialis</i>	limestone daisy	None/ None/ 1B.2	Great Basin scrub, Pinyon and juniper woodland, Subalpine coniferous forest/carbonate/ perennial herb/ May-Jul/ 6234-9514
<i>Erigeron utahensis</i>	Utah daisy	None/ None/ 2.3	Pinyon and juniper woodland(carbonate)/ perennial herb/ May-Jun/ 4921-7612
<i>Eriodictyon angustifolium</i>	narrow-leaved yerba santa	None/ None/ 2.3	Pinyon and juniper woodland/ perennial evergreen shrub/ May-Aug/ 4921-6234
<i>Eriogonum bifurcatum</i>	forked buckwheat	None/ None/ 1B.2	Chenopod scrub(sandy)/ annual herb/ Apr-Jun/ 2116-2657
<i>Eriogonum contiguum</i>	Reveal's buckwheat	None/ None/ 2.3	Mojavean desert scrub(sandy)/ annual herb/ (Feb),Mar-May(Jun),/ 98-4331
<i>Eriogonum evanidum</i>	vanishing wild buckwheat	None/ None/ 1B.1	Chaparral, Cismontane woodland, Lower montane coniferous forest, Pinyon and juniper woodland/sandy or gravelly/ annual herb/ Jul-Oct/ 3609-7300
<i>Eriogonum heermannii</i> var. <i>floccosum</i>	Clark Mountain buckwheat	None/ None/ 4.3	Pinyon and juniper woodland(carbonate)/ perennial deciduous shrub/ Aug-Oct/ 2953-7874
<i>Eriogonum kennedyi</i> var. <i>alpigenum</i>	southern alpine buckwheat	None/ None/ 1B.3	Alpine boulder and rock field, Subalpine coniferous forest/granitic, gravelly/ perennial herb/ Jul-Sep/ 8530-11483
<i>Eriogonum kennedyi</i> var. <i>austromontanum</i>	southern mountain buckwheat	FT/ None/ 1B.2	Lower montane coniferous forest(gravelly), Pebble plain/ perennial herb/ Jun-Sep/ 5807-9482

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Eriogonum microthecum</i> var. <i>alpinum</i>	northern limestone buckwheat	None/ None/ 4.3	Alpine dwarf scrub, Great Basin scrub/sometimes rocky or gravelly/ perennial herb/ Jul-Sep/ 8202-10827
<i>Eriogonum microthecum</i> var. <i>johnstonii</i>	Johnston's buckwheat	None/ None/ 1B.3	Subalpine coniferous forest, Upper montane coniferous forest/rocky/ perennial deciduous shrub/ Jul-Sep/ 6001-9600
<i>Eriogonum microthecum</i> var. <i>lacus-ursi</i>	Bear Lake buckwheat	None/ None/ 1B.1	Great Basin scrub, Lower montane coniferous forest/clay outcrops/ perennial shrub/ Jul-Aug/ 6562-6890
<i>Eriogonum ovalifolium</i> var. <i>vineum</i>	Cushenbury buckwheat	FE/ None/ 1B.1	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/carbonate/ perennial herb/ May-Aug/ 4593-8005
<i>Eriogonum thornei</i>	Thorne's buckwheat	None/ SE/ 1B.2	Pinyon and juniper woodland(gravelly)/ perennial shrub/ Jul-Aug/ 5906- 6004
<i>Eriogonum umbellatum</i> var. <i>juniporinum</i>	juniper sulphur-flowered buckwheat	None/ None/ 2.3	Mojavean desert scrub, Pinyon and juniper woodland/ perennial herb/ Jul-Oct/ 4265-8202
<i>Eriogonum umbellatum</i> var. <i>minus</i>	alpine sulfur-flowered buckwheat	None/ None/ 4.3	Subalpine coniferous forest, Upper montane coniferous forest/gravelly/ perennial herb/ Jun-Sep/ 5906-10066
<i>Erioneuron pilosum</i>	hairy erioneuron	None/ None/ 2.3	Pinyon and juniper woodland(rocky, sometimes carbonate)/ perennial herb/ May-Jun/ 4659-6594
<i>Eriophyllum lanatum</i> var. <i>obovatum</i>	southern Sierra woolly sunflower	None/ None/ 4.3	Lower montane coniferous forest, Upper montane coniferous forest/sandy loam/ perennial herb/ Jun-Jul/ 3655-8202
<i>Eriophyllum mohavense</i>	Barstow woolly sunflower	None/ None/ 1B.2	Chenopod scrub, Mojavean desert scrub, Playas/ annual herb/ (Mar),Apr-May/ 1640-3150
<i>Eschscholzia minutiflora</i> ssp. <i>twisselmannii</i>	Red Rock poppy	None/ None/ 1B.2	Mojavean desert scrub(volcanic tuff)/ annual herb/ Mar-May/ 2231-4035
<i>Euphorbia exstipulata</i> var. <i>exstipulata</i>	Clark Mountain spurge	None/ None/ 2.3	Mojavean desert scrub(rocky)/ annual herb/ Sep/ 4199-6562
<i>Euphorbia jaegeri</i>	Orocopia Mountains spurge	None/ None/ 1B.1	Mojavean desert scrub/Rocky hillsides and arroyos, gravelly or rocky crevices; granitic, carbonate, or metamorphic/ perennial shrub/ Oct- May/ 1969-2789
<i>Fendlerella utahensis</i>	yerba desierto	None/ None/ 4.3	Lower montane coniferous forest, Mojavean desert scrub, Pinyon and juniper woodland/carbonate/ perennial deciduous shrub/ Jun-Aug/ 4265-9186
<i>Fimbristylis thermalis</i>	hot springs fimbristylis	None/ None/ 2.3	Meadows and seeps(alkaline, near hot springs)/ perennial rhizomatous herb/ Jul-Sep/ 361-4396

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Frasera albomarginata</i> var. <i>albomarginata</i>	desert green-gentian	None/ None/ 2.3	Pinyon and juniper woodland(rocky or gravelly)/ perennial herb/ Apr-Jun(Jul),(Aug),(Sep),/ 4495-7595
<i>Frasera albomarginata</i> var. <i>induta</i>	Clark Mountain green-gentian	None/ None/ 1B.2	Pinyon and juniper woodland/Rocky or gravelly, usually carbonate./ perennial herb/ May-Jun(Sep),/ 5594-5807
<i>Frasera neglecta</i>	pine green-gentian	None/ None/ 4.3	Lower montane coniferous forest, Pinyon and juniper woodland, Upper montane coniferous forest/ perennial herb/ May-Jul/ 4593-8202
<i>Fritillaria pinetorum</i>	pine fritillary	None/ None/ 4.3	Chaparral, Lower montane coniferous forest, Pinyon and juniper woodland, Subalpine coniferous forest, Upper montane coniferous forest/granitic or metamorphic/ perennial bulbiferous herb/ May-Jul(Sep),/ 5692-10827
<i>Funastrum utahense</i>	Utah vine milkweed	None/ None/ 4.2	Mojavean desert scrub, Sonoran desert scrub/sandy or gravelly/ perennial herb/ (Mar),Apr-Jun(Sep),(Oct),/ 328-4708
<i>Galium angustifolium</i> ssp. <i>gabrielense</i>	San Antonio Canyon bedstraw	None/ None/ 4.3	Chaparral, Lower montane coniferous forest/granitic, sandy or rocky/ perennial herb/ Apr-Aug/ 3937-8694
<i>Galium angustifolium</i> ssp. <i>gracillimum</i>	slender bedstraw	None/ None/ 4.2	Joshua tree "woodland", Sonoran desert scrub/granitic, rocky/ perennial herb/ Apr-Jun/ 427-5085
<i>Galium californicum</i> ssp. <i>primum</i>	Alvin Meadow bedstraw	None/ None/ 1B.2	Chaparral, Lower montane coniferous forest/granitic, sandy/ perennial herb/ May-Jul/ 4429-5577
<i>Galium hilendiae</i> ssp. <i>kingstonense</i>	Kingston Mountains bedstraw	None/ None/ 1B.3	Lower montane coniferous forest, Pinyon and juniper woodland/rocky/ perennial herb/ (May),Jun/ 3937-6890
<i>Galium jepsonii</i>	Jepson's bedstraw	None/ None/ 4.3	Lower montane coniferous forest, Upper montane coniferous forest/granitic, rocky or gravelly/ perennial rhizomatous herb/ Jul-Aug/ 5052-8202
<i>Galium johnstonii</i>	Johnston's bedstraw	None/ None/ 4.3	Chaparral, Lower montane coniferous forest, Pinyon and juniper woodland, Riparian woodland/ perennial herb/ Jun-Jul/ 4003-7546
<i>Galium munzii</i>	Munz's bedstraw	None/ None/ 4.3	Great Basin scrub, Lower montane coniferous forest, Pinyon and juniper woodland, Upper montane coniferous forest/ perennial herb/ May-Jul/ 3609-10925
<i>Galium proliferum</i>	desert bedstraw	None/ None/ 2.3	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/rocky, carbonate/ annual herb/ Mar-Jun/ 3904-5348
<i>Galium wrightii</i>	Wright's bedstraw	None/ None/ 2.3	Lower montane coniferous forest, Pinyon and juniper woodland/carbonate, rocky/ perennial herb/ Jun-Oct/ 5249-6562
<i>Gentiana fremontii</i>	Fremont's gentian	None/ None/ 2.3	Meadows and seeps(mesic), Upper montane coniferous forest/ annual herb/ Jun-Aug/ 7874-8858
<i>Gilia leptantha</i> ssp. <i>leptantha</i>	San Bernardino gilia	None/ None/ 1B.3	Lower montane coniferous forest(sandy or gravelly)/ annual herb/ Jun-Aug/ 4921-8399

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Glossopetalon pungens</i>	pungent glossopetalon	None/ None/ 1B.2	Chaparral, Pinyon and juniper woodland/carbonate/ perennial deciduous shrub/ May-Jun/ 5495-6562
<i>Grimmia vaginulata</i>	vaginulate grimmia	None/ None/ 1B.1	Chaparral (openings)/ Rocky, boulder and rock walks, carbonate/ moss/ NA/
<i>Grusonia parishii</i>	Parish's club-cholla	None/ None/ 2.3	Joshua tree "woodland", Mojavean desert scrub, Sonoran desert scrub/sandy, rocky/ perennial stem succulent/ May-Jun(Jul)/ 984-5000
<i>Hecastocleis shockleyi</i>	prickle-leaf	None/ None/ 3	Chenopod scrub, Mojavean desert scrub/rocky slopes, washes; often carbonate or slate/ perennial evergreen shrub/ May-Jul/ 3937-7218
<i>Hedeoma drummondii</i>	Drummond's false pennyroyal	None/ None/ 2.3	Great Basin scrub, Pinyon and juniper woodland/rocky or gravelly, usually carbonate/ perennial herb/ May-Jul/ 4593-5577
<i>Hedeoma nana</i> ssp. <i>californica</i>	California mock pennyroyal	None/ None/ 4.3	Joshua tree "woodland", Pinyon and juniper woodland/rocky, often carbonate/ perennial herb/ Apr-Jun/ 2805-6890
<i>Helianthus nuttallii</i> ssp. <i>parishii</i>	Los Angeles sunflower	None/ None/ 1A	Marshes and swamps(coastal salt and freshwater)/ perennial rhizomatous herb/ Aug-Oct/ 33-5495
<i>Heuchera abramsii</i>	Abrams' alumroot	None/ None/ 4.3	Upper montane coniferous forest(rocky)/ perennial rhizomatous herb/ Jul-Aug/ 9186-11483
<i>Heuchera caespitosa</i>	urn-flowered alumroot	None/ None/ 4.3	Cismontane woodland, Lower montane coniferous forest, Riparian forest(montane), Upper montane coniferous forest/rocky/ perennial rhizomatous herb/ May-Aug/ 3789-8694
<i>Heuchera hirsutissima</i>	shaggy-haired alumroot	None/ None/ 1B.3	Subalpine coniferous forest, Upper montane coniferous forest/rocky, granitic/ perennial rhizomatous herb/ (May),Jun-Jul/ 4987-11483
<i>Heuchera parishii</i>	Parish's alumroot	None/ None/ 1B.3	Alpine boulder and rock field, Lower montane coniferous forest, Subalpine coniferous forest, Upper montane coniferous forest/rocky, sometimes carbonate/ perennial rhizomatous herb/ Jun-Aug/ 4921-12467
<i>Horkelia cuneata</i> var. <i>puberula</i>	mesa horkelia	None/ None/ 1B.1	Chaparral(maritime), Cismontane woodland, Coastal scrub/sandy or gravelly/ perennial herb/ Feb-Jul(Sep)/ 230-2657
<i>Horkelia wilderae</i>	Barton Flats horkelia	None/ None/ 1B.1	Chaparral(edges), Lower montane coniferous forest, Upper montane coniferous forest/ perennial herb/ May-Sep/ 5495-9596
<i>Hulsea vestita</i> ssp. <i>gabrielensis</i>	San Gabriel Mountains sunflower	None/ None/ 4.3	Lower montane coniferous forest, Upper montane coniferous forest/rocky/ perennial herb/ May-Jul/ 4921-8202
<i>Hulsea vestita</i> ssp. <i>parryi</i>	Parry's sunflower	None/ None/ 4.3	Lower montane coniferous forest, Pinyon and juniper woodland, Upper montane coniferous forest/granitic or carbonate, rocky, openings/ perennial herb/ Apr-Aug/ 4495-9498
<i>Hulsea vestita</i> ssp. <i>pygmaea</i>	pygmy hulsea	None/ None/ 1B.3	Alpine boulder and rock field, Subalpine coniferous forest/granitic, gravelly/ perennial herb/ Jun-Oct/ 9301-12795
<i>Hymenopappus filifolius</i> var. <i>eriopodus</i>	hairy-podded fine-leaf hymenopappus	None/ None/ 2.3	Pinyon and juniper woodland/carbonate/ perennial herb/ May-Jul/ 5249-5577
<i>Hymenoxys odorata</i>	bitter hymenoxys	None/ None/ 2.3	Riparian scrub, Sonoran desert scrub/sandy/ annual herb/ Feb-Nov/ 148-492

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Imperata brevifolia</i>	California satintail	None/ None/ 2.3	Chaparral, Coastal scrub, Mojavean desert scrub, Meadows and seeps(often alkali), Riparian scrub/mesic/ perennial rhizomatous herb/ Sep-May/ 0-3986
<i>Ivesia argyrocoma</i> var. <i>argyrocoma</i>	silver-haired ivesia	None/ None/ 1B.2	Meadows and seeps(alkaline), Pebble plain, Upper montane coniferous forest/ perennial herb/ Jun-Aug/ 4800-9711
<i>Ivesia jaegeri</i>	Jaeger's ivesia	None/ None/ 1B.3	Pinyon and juniper woodland, Upper montane coniferous forest/carbonate, rocky/ perennial herb/ Jun-Jul/ 6004-11811
<i>Ivesia patellifera</i>	Kingston Mountains ivesia	None/ None/ 1B.3	Pinyon and juniper woodland(granitic, rocky)/ perennial herb/ Jun-Oct/ 4593-6890
<i>Jaffueliobryum raui</i>	Rau's jaffueliobryum moss	None/ None/ 2B.3	Alpine dwarf scrub, Chaparral, Mojavean desert scrub, Sonoran desert scrub/ dry openings, rock crevices, carbonate/ moss/ NA/ 1608-6890
<i>Jaffueliobryum wrightii</i>	Wright's jaffueliobryum moss	None/ None/ 2B.3	Alpine dwarf scrub, Mojavean desert scrub, Pinyon and juniper woodland/ dry openings, rock crevices, carbonate/ moss/ NA/ 525 - 8202
<i>Juglans californica</i>	Southern California black walnut	None/ None/ 4.2	Chaparral, Cismontane woodland, Coastal scrub/alluvial/ perennial deciduous tree/ Mar-Aug/ 164-2953
<i>Juncus cooperi</i>	Cooper's rush	None/ None/ 4.3	Meadows and seeps(mesic, alkaline or saline)/ perennial herb/ Apr-May(Aug),/ -853-5807
<i>Juncus duranii</i>	Duran's rush	None/ None/ 4.3	Lower montane coniferous forest, Meadows and seeps, Upper montane coniferous forest/mesic/ perennial rhizomatous herb/ Jul-Aug/ 5801-9199
<i>Juncus interior</i>	inland rush	None/ None/ 2.3	Pinyon and juniper woodland/ perennial herb/ Jun-Aug/ 6004-6053
<i>Juncus nevadensis</i> var. <i>inventus</i>	(blank)	None/ None/ 2.3	Bogs and fens/ perennial rhizomatous herb/ Jul-Nov/ 0-33
<i>Juncus nodosus</i>	knotted rush	None/ None/ 2.3	Meadows and seeps(mesic), Marshes and swamps(lake margins)/ perennial rhizomatous herb/ Jul-Sep/ 98-6496
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	None/ None/ 1B.1	Marshes and swamps(coastal salt), Playas, Vernal pools/ annual herb/ Feb-Jun/ 3-4003
<i>Lepechinia fragrans</i>	fragrant pitcher sage	None/ None/ 4.2	Chaparral/ perennial shrub/ Mar-Oct/ 66-4298
<i>Lepidium virginicum</i> var. <i>robinsonii</i>	Robinson's pepper-grass	None/ None/ 4.3	Chaparral, Coastal scrub/ annual herb/ Jan-Jul/ 3-2904
<i>Lewisia brachycalyx</i>	short-sepaled lewisia	None/ None/ 2.3	Lower montane coniferous forest, Meadows and seeps/mesic/ perennial herb/ Feb-Jun(Jul),/ 4495-7546
<i>Lilium humboldtii</i> ssp. <i>ocellatum</i>	ocellated Humboldt lily	None/ None/ 4.2	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Riparian woodland/openings/ perennial bulbiferous herb/ Mar-Jul(Aug),/ 98-5906

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Lilium parryi</i>	lemon lily	None/ None/ 1B.2	Lower montane coniferous forest, Meadows and seeps, Riparian forest, Upper montane coniferous forest/mesic/ perennial bulbiferous herb/ Jul-Aug/ 4003-9006
<i>Linanthus bernardinus</i>	Pioneertown linanthus	None/ None/ 1B.2	Joshua tree "woodland", Pinyon and juniper woodland/ annual herb/ Mar-May/ 3904-4396
<i>Linanthus concinnus</i>	San Gabriel linanthus	None/ None/ 1B.2	Chaparral, Lower montane coniferous forest, Upper montane coniferous forest/rocky, openings/ annual herb/ Apr-Jul/ 4987-9186
<i>Linanthus killipii</i>	Baldwin Lake linanthus	None/ None/ 1B.2	Joshua tree "woodland", Meadows and seeps(alkaline), Pebble plain, Pinyon and juniper woodland/ annual herb/ May-Jul/ 5577-7874
<i>Linanthus maculatus</i>	Little San Bernardino Mtns. linanthus	None/ None/ 1B.2	Desert dunes, Joshua tree "woodland", Mojavean desert scrub, Sonoran desert scrub/sandy/ annual herb/ Mar-May/ 640-6808
<i>Linanthus orcuttii</i>	Orcutt's linanthus	None/ None/ 1B.3	Chaparral, Lower montane coniferous forest, Pinyon and juniper woodland/openings/ annual herb/ May-Jun/ 3002-7037
<i>Linum puberulum</i>	plains flax	None/ None/ 2.3	Great Basin scrub, Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/ perennial herb/ May-Jul/ 3281-8202
<i>Lithospermum incisum</i>	plains stoneseed	None/ None/ 2.3	Pinyon and juniper woodland/ perennial herb/ May/ 5413-5643
<i>Loeflingia squarrosa</i> var. <i>artemisiarum</i>	sagebrush loeflingia	None/ None/ 2.3	Desert dunes, Great Basin scrub, Sonoran desert scrub/sandy/ annual herb/ Apr-May/ 2297-5299
<i>Loeseliastrum depressum</i>	depressed standing-cypress	None/ None/ 4.3	Great Basin scrub, Mojavean desert scrub, Pinyon and juniper woodland/sandy or gravelly/ annual herb/ NA/ 4003-6890
<i>Lupinus magnificus</i> var. <i>glarecola</i>	Coso Mountains lupine	None/ None/ 4.3	Great Basin scrub, Joshua tree "woodland", Mojavean desert scrub/granitic, often talus and scree/ perennial herb/ Apr-Jun/ 3642-8005
<i>Lycium californicum</i>	California box-thorn	None/ None/ 4.2	Coastal bluff scrub, Coastal scrub/ perennial shrub/ (Dec),Mar-Aug/ 16-492
<i>Lycium parishii</i>	Parish's desert-thorn	None/ None/ 2.3	Coastal scrub, Sonoran desert scrub/ perennial shrub/ Mar-Apr/ 443-3281
<i>Malacothamnus parishii</i>	Parish's bush-mallow	None/ None/ 1A	Chaparral, Coastal scrub/ perennial deciduous shrub/ Jun-Jul/ 1001-1493
<i>Malaxis monophyllos</i> var. <i>brachypoda</i>	white bog adder's-mouth	None/ None/ 2.3	Bogs and fens, Meadows and seeps, Upper montane coniferous forest/mesic/ perennial bulbiferous herb/ Jun-Aug/ 7218-8999
<i>Mammillaria grahamii</i> var. <i>grahamii</i>	Graham's fishhook cactus	None/ None/ 2.3	Sonoran desert scrub/gravelly or rocky/ perennial stem succulent/ Apr-Sep/ 984-2953
<i>Matelea parvifolia</i>	spearleaf	None/ None/ 2.3	Mojavean desert scrub, Sonoran desert scrub/rocky/ perennial herb/ Mar-May/ 1444-3593
<i>Maurandella antirrhiniflora</i>	violet twining snapdragon	None/ None/ 2.3	Joshua tree "woodland", Mojavean desert scrub/carbonate/ perennial herb/ Apr-May/ 2493-5003

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Menodora scabra</i>	rough menodora	None/ None/ 2.3	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/ perennial herb/ May-Jun/ 3937-5906
<i>Menodora spinescens</i> var. <i>mohavensis</i>	Mojave menodora	None/ None/ 1B.2	Mojavean desert scrub/Andesite gravel, rocky hillsides, canyons/ perennial deciduous shrub/ Apr-May/ 2264-6562
<i>Mentzelia eremophila</i>	solitary blazing star	None/ None/ 4.2	Mojavean desert scrub/ annual herb/ Mar-May/ 2297-4003
<i>Mentzelia polita</i>	polished blazing star	None/ None/ 1B.2	Mojavean desert scrub/carbonate/ perennial herb/ Apr-Aug/ 3937-5184
<i>Mentzelia pterosperma</i>	wing-seed blazing star	None/ None/ 2.3	Mojavean desert scrub/clay, gypseous/ annual/perennial herb/ Apr-Jun/ 3740-3740
<i>Mentzelia puberula</i>	Darlington's blazing star	None/ None/ 2.3	Mojavean desert scrub, Sonoran desert scrub/sandy or rocky/ perennial herb/ Mar-May/ 295-4199
<i>Mentzelia tricuspis</i>	spiny-hair blazing star	None/ None/ 2.3	Mojavean desert scrub/sandy, gravelly, slopes, and washes/ annual herb/ Mar-May/ 492-4199
<i>Mentzelia tridentata</i>	creamy blazing star	None/ None/ 1B.3	Mojavean desert scrub/rocky, gravelly, sandy/ annual herb/ Mar-May/ 2297-3806
<i>Mimulus exiguus</i>	San Bernardino Mountains monkeyflower	None/ None/ 1B.2	Meadows and seeps, Pebble plain, Upper montane coniferous forest/mesic, clay/ annual herb/ May-Jul/ 5906-7595
<i>Mimulus johnstonii</i>	Johnston's monkeyflower	None/ None/ 4.3	Lower montane coniferous forest(scree, disturbed areas, rocky or gravelly, roadside)/ annual herb/ May-Aug/ 3199-9580
<i>Mimulus mohavensis</i>	Mojave monkeyflower	None/ None/ 1B.2	Joshua tree "woodland", Mojavean desert scrub/sandy or gravelly, often in washes/ annual herb/ Apr-Jun/ 1969-3937
<i>Mimulus purpureus</i>	little purple monkeyflower	None/ None/ 1B.2	Meadows and seeps, Pebble plain, Upper montane coniferous forest/ annual herb/ May-Jun/ 6234-7546
<i>Mirabilis coccinea</i>	red four o'clock	None/ None/ 2.3	Pinyon and juniper woodland/ perennial herb/ May-Jul/ 3510-5906
<i>Mirabilis tenuiloba</i>	slender-lobed four o'clock	None/ None/ 4.3	Sonoran desert scrub/ perennial herb/ (Feb),Mar-May/ 984-3593
<i>Monarda pectinata</i>	plains bee balm	None/ None/ 2.3	Joshua tree "woodland", Pinyon and juniper woodland/rocky/ annual herb/ Jul-Sep/ 3773-5003
<i>Monardella australis</i> ssp. <i>cinerea</i>	gray monardella	None/ None/ 4.3	Lower montane coniferous forest, Subalpine coniferous forest, Upper montane coniferous forest/ perennial rhizomatous herb/ Jul-Aug/ 5906-10007
<i>Monardella australis</i> ssp. <i>jokerstii</i>	Jokerst's monardella	None/ None/ 1B.1	Chaparral, Lower montane coniferous forest/Steep scree or talus slopes between breccia, secondary alluvial benches along drainages and washes./ perennial rhizomatous herb/ Jul-Sep/ 4429-5741
<i>Monardella boydii</i>	Boyd's monardella	None/ None/ 1B.2	Mojavean desert scrub, Pinyon and juniper woodland, Riparian scrub(desert)/Usually in alluvial soils and cracks of bedrock in washes on canyon bottoms and rocky slopes./ perennial shrub/ Aug-Oct/ 4593-5413

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Monardella eremicola</i>	Clark Mountain monardella	None/ None/ 1B.3	Pinyon and juniper woodland, Riparian scrub(desert)/Granitic or carbonate. Usually in bedrock cracks and benches along canyon washes./ perennial shrub/ Jun-Aug/ 4921-6890
<i>Monardella macrantha</i> ssp. <i>hallii</i>	Hall's monardella	None/ None/ 1B.3	Broadleaved upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Valley and foothill grassland/ perennial rhizomatous herb/ Jun-Oct/ 2395-7201
<i>Monardella pringlei</i>	Pringle's monardella	None/ None/ 1A	Coastal scrub(sandy)/ annual herb/ May-Jun/ 984-1312
<i>Monardella robisonii</i>	Robison's monardella	None/ None/ 1B.3	Pinyon and juniper woodland/ perennial rhizomatous herb/ (Feb),Apr-Sep(Oct),/ 2001-4921
<i>Monardella saxicola</i>	rock monardella	None/ None/ 4.2	Closed-cone coniferous forest, Chaparral, Lower montane coniferous forest/rocky, usually serpentinite/ perennial rhizomatous herb/ Jun-Sep/ 1640-5906
<i>Mortonia utahensis</i>	Utah mortonia	None/ None/ 4.3	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/carbonate/ perennial evergreen shrub/ Mar-May/ 2493-6890
<i>Mucronea californica</i>	California spineflower	None/ None/ 4.2	Chaparral, Cismontane woodland, Coastal dunes, Coastal scrub, Valley and foothill grassland/sandy/ annual herb/ Mar-Jul(Aug),/ 0-4593
<i>Muhlenbergia alopecuroides</i>	wolftail	None/ None/ 2.3	Joshua tree "woodland", Pinyon and juniper woodland/ perennial herb/ Aug-Sep/ 1640-1640
<i>Muhlenbergia appressa</i>	appressed muhly	None/ None/ 2.3	Coastal scrub, Mojavean desert scrub, Valley and foothill grassland/rocky/ annual herb/ Apr-May/ 66-5249
<i>Muhlenbergia arsenei</i>	tough muhly	None/ None/ 2.3	Pinyon and juniper woodland(rocky, carbonate)/ perennial rhizomatous herb/ Aug-Oct/ 4593-6102
<i>Muhlenbergia californica</i>	California muhly	None/ None/ 4.3	Chaparral, Coastal scrub, Lower montane coniferous forest, Meadows and seeps/mesic, seeps and streambanks/ perennial rhizomatous herb/ Jun-Sep/ 328-6562
<i>Muhlenbergia fragilis</i>	delicate muhly	None/ None/ 2.3	Pinyon and juniper woodland(carbonate, gravelly)/ annual herb/ Oct/ 5249-5249
<i>Muhlenbergia pauciflora</i>	few-flowered muhly	None/ None/ 2.3	Pinyon and juniper woodland(rocky)/ perennial rhizomatous herb/ Sep-Oct/ 5758-6102
<i>Muilla coronata</i>	crowned muilla	None/ None/ 4.2	Chenopod scrub, Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/ perennial bulbiferous herb/ Mar-Apr(May),/ 2510-6430
<i>Munroa squarrosa</i>	false buffalo-grass	None/ None/ 2.3	Pinyon and juniper woodland(gravelly or rocky)/ annual herb/ Oct/ 4921-5906
<i>Myosurus minimus</i> ssp. <i>apus</i>	little mouse-tail	None/ None/ 3.1	Valley and foothill grassland, Vernal pools(alkaline)/ annual herb/ Mar-Jun/ 66-2100
<i>Nama dichotomum</i> var. <i>dichotomum</i>	forked purple mat	None/ None/ 2.3	Pinyon and juniper woodland(granitic or carbonate)/ annual herb/ Sep-Oct/ 6234-7218
<i>Nasturtium gambelii</i>	Gambel's water cress	FE/ ST/ 1B.1	Marshes and swamps(freshwater or brackish)/ perennial rhizomatous herb/ Apr-Oct/ 16-1083

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Navarretia peninsularis</i>	Baja navarretia	None/ None/ 1B.2	Chaparral(openings), Lower montane coniferous forest, Meadows and seeps, Pinyon and juniper woodland/mesic/ annual herb/ Jun-Aug/ 4921-7546
<i>Navarretia prostrata</i>	prostrate vernal pool navarretia	None/ None/ 1B.1	Coastal scrub, Meadows and seeps, Valley and foothill grassland(alkaline), Vernal pools/Mesic/ annual herb/ Apr-Jul/ 49-3970
<i>Nemacaulis denudata</i> var. <i>gracilis</i>	slender cottonheads	None/ None/ 2.3	Coastal dunes, Desert dunes, Sonoran desert scrub/ annual herb/ (Mar),Apr-May/ -164-1312
<i>Oenothera caespitosa</i> ssp. <i>crinita</i>	caespitose evening-primrose	None/ None/ 4.2	Pinyon and juniper woodland, Subalpine coniferous forest, Sonoran desert scrub/ perennial rhizomatous herb/ Jun-Sep/ 3773-11056
<i>Oenothera cavernae</i>	cave evening-primrose	None/ None/ 2.3	Great Basin scrub, Joshua tree "woodland", Mojavean desert scrub/gravelly, often calcareous/ annual herb/ Mar-Nov/ 2493-4199
<i>Oenothera longissima</i>	long-stem evening-primrose	None/ None/ 2.3	Mojavean desert scrub, Pinyon and juniper woodland/seasonally mesic/ annual/perennial herb/ Jul-Sep/ 3281-5577
<i>Ophioglossum californicum</i>	California adder's-tongue	None/ None/ 4.2	Chaparral, Valley and foothill grassland, Vernal pools(margins)/mesic/ perennial rhizomatous herb/ (Dec),Jan-Jun/ 197-1722
<i>Opuntia basilaris</i> var. <i>brachyclada</i>	short-joint beavertail	None/ None/ 1B.2	Chaparral, Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/ perennial stem succulent/ Apr-Jun(Aug),/ 1394-5906
<i>Opuntia wigginsii</i>	Wiggins' cholla	None/ None/ 3.3	Sonoran desert scrub(sandy)/ perennial stem succulent/ Mar/ 98-2904
<i>Opuntia xcurvispina</i>	curved-spine beavertail	None/ None/ 2.3	Chaparral, Mojavean desert scrub, Pinyon and juniper woodland/ perennial stem succulent/ Apr-Jun/ 3281-4593
<i>Oreonana vestita</i>	woolly mountain-parsley	None/ None/ 1B.3	Lower montane coniferous forest, Subalpine coniferous forest, Upper montane coniferous forest/gravel or talus/ perennial herb/ Mar-Sep/ 5299-11483
<i>Orobanche valida</i> ssp. <i>valida</i>	Rock Creek broomrape	None/ None/ 1B.2	Chaparral, Pinyon and juniper woodland/granitic/ perennial herb parasitic/ May-Sep/ 4101-6562
<i>Oxytropis oreophila</i> var. <i>oreophila</i>	rock-loving oxytrope	None/ None/ 2.3	Alpine boulder and rock field, Subalpine coniferous forest/gravelly or rocky/ perennial herb/ Jun-Sep/ 11155-12467
<i>Packera bernardina</i>	San Bernardino ragwort	None/ None/ 1B.2	Meadows and seeps(mesic, sometimes alkaline), Pebble plain, Upper montane coniferous forest/ perennial herb/ May-Jul/ 5906-7546
<i>Packera ionophylla</i>	Tehachapi ragwort	None/ None/ 4.3	Lower montane coniferous forest, Upper montane coniferous forest/granitic, rocky/ perennial herb/ Jun-Jul/ 4921-8858
<i>Panicum hirticaule</i> ssp. <i>hirticaule</i>	roughstalk witch grass	None/ None/ 2.3	Desert dunes, Joshua tree "woodland", Mojavean desert scrub, Sonoran desert scrub/sandy, silty, depressions/ annual herb/ Aug-Dec/ 148-4314
<i>Parkinsonia microphylla</i>	little-leaved palo verde	None/ None/ 4.3	Mojavean desert scrub(rocky or gravelly)/ perennial deciduous shrub/ Apr-May/ 148-3510

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Parnassia cirrata</i> var. <i>cirrata</i>	San Bernardino grass-of- Parnassus	None/ None/ 1B.3	Lower montane coniferous forest, Meadows and seeps, Upper montane coniferous forest/mesic, stream sides, sometimes calcareous/ perennial herb/ Aug-Sep/ 4101-8005
<i>Pediomelum castoreum</i>	Beaver Dam breadroot	None/ None/ 1B.2	Joshua tree "woodland", Mojavean desert scrub/Sandy, washes and roadcuts/ perennial herb/ Apr-May/ 2001-5003
<i>Pellaea truncata</i>	spiny cliff-brake	None/ None/ 2.3	Pinyon and juniper woodland(volcanic or granitic, rocky)/ perennial rhizomatous herb/ Apr-Jun/ 3937-7054
<i>Penstemon albomarginatus</i>	white-margined beardtongue	None/ None/ 1B.1	Desert dunes(stabilized), Mojavean desert scrub(sandy)/ perennial herb/ Mar-May/ 2100-3494
<i>Penstemon bicolor</i> ssp. <i>roseus</i>	rosy two-toned beardtongue	None/ None/ 1B.1	Joshua tree "woodland", Mojavean desert scrub/rocky or gravelly, sometimes disturbed areas/ perennial herb/ May/ 2297-4921
<i>Penstemon calcareus</i>	limestone beardtongue	None/ None/ 1B.3	Joshua tree "woodland", Mojavean desert scrub, Pinyon and juniper woodland/carbonate, rocky/ perennial herb/ Apr-May/ 3494-6693
<i>Penstemon fruticiformis</i> var. <i>amargosae</i>	Amargosa beardtongue	None/ None/ 1B.3	Mojavean desert scrub/ perennial herb/ Apr-Jun/ 2789-4593
<i>Penstemon pseudospectabilis</i> ssp. <i>pseudospectabilis</i>	desert beardtongue	None/ None/ 2.3	Mojavean desert scrub, Sonoran desert scrub/often sandy washes, sometimes rocky/ perennial herb/ Jan-May/ 262-6348
<i>Penstemon stephensii</i>	Stephens' beardtongue	None/ None/ 1B.3	Mojavean desert scrub, Pinyon and juniper woodland/usually carbonate, rocky/ perennial herb/ Apr-Jun/ 3806-6070
<i>Penstemon thompsoniae</i>	Thompson's beardtongue	None/ None/ 2.3	Pinyon and juniper woodland(gravelly, carbonate)/ perennial herb/ May-Jun/ 4921-8858
<i>Penstemon thurberi</i>	Thurber's beardtongue	None/ None/ 4.2	Chaparral, Joshua tree "woodland", Pinyon and juniper woodland, Sonoran desert scrub/ perennial herb/ May-Jul/ 1640-4003
<i>Penstemon utahensis</i>	Utah beardtongue	None/ None/ 2.3	Chenopod scrub, Great Basin scrub, Mojavean desert scrub, Pinyon and juniper woodland/rocky/ perennial herb/ Apr-May/ 3494-8202
<i>Pentachaeta aurea</i> ssp. <i>aurea</i>	golden-rayed pentachaeta	None/ None/ 4.2	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Riparian woodland, Valley and foothill grassland/ annual herb/ Mar-Jul/ 262-6070
<i>Perideridia parishii</i> ssp. <i>parishii</i>	Parish's yampah	None/ None/ 2.3	Lower montane coniferous forest, Meadows and seeps, Upper montane coniferous forest/ perennial herb/ Jun-Aug/ 4806-9843
<i>Petalonyx thurberi</i> ssp. <i>gilmanii</i>	Death Valley sandpaper-plant	None/ None/ 1B.3	Desert dunes, Mojavean desert scrub/ perennial evergreen shrub/ May-Sep/ 853-4741
<i>Petradoria pumila</i> ssp. <i>pumila</i>	rock goldenrod	None/ None/ 4.3	Pinyon and juniper woodland(rocky, carbonate)/ perennial herb/ Jul-Oct/ 3510-11155
<i>Phacelia anelsonii</i>	Aven Nelson's phacelia	None/ None/ 2.3	Joshua tree "woodland", Pinyon and juniper woodland/carbonate, sandy or gravelly/ annual herb/ Apr-May/ 3937-4921
<i>Phacelia barnebyana</i>	Barneby's phacelia	None/ None/ 2.3	Great Basin scrub, Pinyon and juniper woodland/usually carbonate, gravelly, rocky/ annual herb/ May-Jul/ 5249-8858

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Phacelia coerulea</i>	sky-blue phacelia	None/ None/ 2.3	Mojavean desert scrub, Pinyon and juniper woodland/ annual herb/ Apr-May/ 4593-6562
<i>Phacelia exilis</i>	Transverse Range phacelia	None/ None/ 4.3	Lower montane coniferous forest, Meadows and seeps, Pebble plain, Upper montane coniferous forest/sandy or gravelly/ annual herb/ May-Aug/ 3609-8858
<i>Phacelia mohavensis</i>	Mojave phacelia	None/ None/ 4.3	Cismontane woodland, Lower montane coniferous forest, Meadows and seeps, Pinyon and juniper woodland/sandy or gravelly/ annual herb/ Apr-Aug/ 4593-8202
<i>Phacelia mustelina</i>	Death Valley round-leaved phacelia	None/ None/ 1B.3	Mojavean desert scrub, Pinyon and juniper woodland/carbonate or volcanic, gravelly or rocky/ annual herb/ May-Jul/ 2395-8596
<i>Phacelia parishii</i>	Parish's phacelia	None/ None/ 1B.1	Mojavean desert scrub, Playas/clay or alkaline/ annual herb/ Apr-May(Jun),(Jul),/ 1772-3937
<i>Phacelia perityloides</i> var. <i>jaegeri</i>	Jaeger's phacelia	None/ None/ 1B.3	Pinyon and juniper woodland(rocky, often carbonate)/ perennial herb/ May-Jul/ 6004-7694
<i>Phacelia pulchella</i> var. <i>gooddingii</i>	Goodding's phacelia	None/ None/ 2.3	Mojavean desert scrub(clay, often alkaline)/ annual herb/ Apr-Jun/ 2510-3281
<i>Phacelia stellaris</i>	Brand's star phacelia	FC/ None/ 1B.1	Coastal dunes, Coastal scrub/ annual herb/ Mar-Jun/ 3-1312
<i>Phlox dolichantha</i>	Big Bear Valley phlox	None/ None/ 1B.2	Pebble plain, Upper montane coniferous forest(openings)/ perennial herb/ May-Jul/ 6004-9744
<i>Pholistoma auritum</i> var. <i>arizonicum</i>	Arizona pholistoma	None/ None/ 2.3	Mojavean desert scrub/ annual herb/ Mar/ 902-2740
<i>Physalis lobata</i>	lobed ground-cherry	None/ None/ 2.3	Mojavean desert scrub(decomposed granitic), Playas/ perennial herb/ (May),Sep-Jan/ 1640-2625
<i>Physaria chambersii</i>	Chambers' physaria	None/ None/ 2.3	Pinyon and juniper woodland(carbonate, rocky)/ perennial herb/ Apr-May/ 4921-8497
<i>Physaria kingii</i> ssp. <i>bernardina</i>	San Bernardino Mountains bladderpod	FE/ None/ 1B.1	Lower montane coniferous forest, Pinyon and juniper woodland, Subalpine coniferous forest/usually carbonate/ perennial herb/ May-Jun/ 6070-8858
<i>Pickeringia montana</i> var. <i>tomentosa</i>	woolly chaparral-pea	None/ None/ 4.3	Chaparral/Gabbroic, granitic, clay/ evergreen shrub/ May-Aug/ 0-5577
<i>Pinus edulis</i>	two-needle pinyon pine	None/ None/ 3.3	Lower montane coniferous forest, Pinyon and juniper woodland/ perennial evergreen tree/ NA/ 4265-8858
<i>Piperia cooperi</i>	chaparral rein orchid	None/ None/ 4.2	Chaparral, Cismontane woodland, Valley and foothill grassland/ perennial herb/ Mar-Jun/ 49-5200
<i>Piperia leptopetala</i>	narrow-petaled rein orchid	None/ None/ 4.3	Cismontane woodland, Lower montane coniferous forest, Upper montane coniferous forest/ perennial herb/ May-Jul/ 1247-7300
<i>Plagiobothrys parishii</i>	Parish's popcorn-flower	None/ None/ 1B.1	Great Basin scrub, Joshua tree "woodland"/alkaline, mesic/ annual herb/ Mar-Jun(Nov),/ 2461-4593

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Plagiobryoides vinosula</i>	wine-colored tufa moss	None/ None/ 4.2	Cismontane woodland/ Mojavean desert scrub/ Meadows and seeps/ Pinyon and juniper woodland/ Riparian woodland/ usually granitic rock or granitic soil along seeps and streams, sometimes clay/moss/ NA/ 98-5692
<i>Poa atropurpurea</i>	San Bernardino blue grass	FE/ None/ 1B.2	Meadows and seeps(mesic)/ perennial rhizomatous herb/ (Apr),May-Jul(Aug),/ 4462-8054
<i>Podistera nevadensis</i>	Sierra podistera	None/ None/ 4.3	Alpine boulder and rock field/ perennial herb/ Jul-Sep/ 9843-13123
<i>Poliomintha incana</i>	frosted mint	None/ None/ 2.3	Lower montane coniferous forest(mesic)/ perennial shrub/ Jun-Jul/ 5249-5577
<i>Polygala acanthoclada</i>	thorny milkwort	None/ None/ 2.3	Chenopod scrub, Joshua tree "woodland", Pinyon and juniper woodland/ perennial shrub/ May-Aug/ 2493-7497
<i>Polygala intermontana</i>	intermountain milkwort	None/ None/ 2.3	Pinyon and juniper woodland/ perennial shrub/ Jun-Jul/ 6594-10105
<i>Polystichum kruckebergii</i>	Kruckeberg's sword fern	None/ None/ 4.3	Subalpine coniferous forest, Upper montane coniferous forest/rocky/ perennial rhizomatous herb/ Jun-Aug/ 6890-10499
<i>Populus angustifolia</i>	narrow-leaved cottonwood	None/ None/ 2.3	Riparian forest/ perennial deciduous tree/ Mar-Apr/ 3937-5906
<i>Portulaca halimoides</i>	desert portulaca	None/ None/ 4.2	Joshua tree "woodland"(sandy)/ annual herb/ Sep/ 3281-3937
<i>Proboscidea althaeifolia</i>	desert unicorn-plant	None/ None/ 4.3	Sonoran desert scrub(sandy)/ perennial herb/ May-Aug(Sep),(Oct),/ 279-3281
<i>Prunus eremophila</i>	Mojave Desert plum	None/ None/ 1B.2	Mojavean desert scrub/granitic or rhyolitic, usually washes/ perennial deciduous shrub/ Mar-Apr/ 3199-3855
<i>Psoralethamnus arborescens</i> var. <i>arborescens</i>	Mojave indigo-bush	None/ None/ 4.3	Mojavean desert scrub, Riparian scrub/ perennial deciduous shrub/ Apr-May/ 1312-3888
<i>Psoralethamnus fremontii</i> var. <i>attenuatus</i>	narrow-leaved psoralethamnus	None/ None/ 2.3	Sonoran desert scrub(granitic or volcanic)/ perennial shrub/ Apr/ 1099-3002
<i>Puccinellia parishii</i>	Parish's alkali grass	None/ None/ 1B.1	Meadows and seeps(alkaline springs and seeps)/ annual herb/ Apr-May/ 2297-3281
<i>Pyrrocoma uniflora</i> var. <i>gossypina</i>	Bear Valley pyrrocoma	None/ None/ 1B.2	Meadows and seeps, Pebble plain/ perennial herb/ Jul-Sep/ 5249-7546
<i>Quercus turbinella</i>	shrub live oak	None/ None/ 4.3	Chaparral, Cismontane woodland, Lower montane coniferous forest, Pinyon and juniper woodland/ perennial evergreen shrub/ Apr-Jun/ 3937-6562
<i>Ribes divaricatum</i> var. <i>parishii</i>	Parish's gooseberry	None/ None/ 1A	Riparian woodland/ perennial deciduous shrub/ Feb-Apr/ 213-984
<i>Robinia neomexicana</i>	New Mexico locust	None/ None/ 2.3	Pinyon and juniper woodland(sandy)/ perennial deciduous shrub/ May-Jul/ 4921-5807

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Rupertia rigida</i>	Parish's rupertia	None/ None/ 4.3	Chaparral, Cismontane woodland, Lower montane coniferous forest, Meadows and seeps, Pebble plain, Valley and foothill grassland/ perennial herb/ Jun-Aug/ 2297-8202
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	None/ None/ 1B.2	Marshes and swamps(assorted shallow freshwater)/ perennial rhizomatous herb emergent/ May-Oct/ 0-2133
<i>Saltugilia latimeri</i>	Latimer's woodland-gilia	None/ None/ 1B.2	Chaparral, Mojavean desert scrub, Pinyon and juniper woodland/rocky or sandy, often granitic, sometimes washes/ annual herb/ Mar-Jun/ 1312-6234
<i>Salvia greatae</i>	Orocopia sage	None/ None/ 1B.3	Mojavean desert scrub, Sonoran desert scrub/ perennial evergreen shrub/ Mar-Apr/ -131-2707
<i>Sanvitalia abertii</i>	Abert's sanvitalia	None/ None/ 2.3	Pinyon and juniper woodland(carbonate)/ annual herb/ Aug-Sep/ 5151-5906
<i>Schoenus nigricans</i>	black bog-rush	None/ None/ 2.3	Marshes and swamps(often alkaline)/ perennial herb/ Aug-Sep/ 492-6562
<i>Sclerocactus johnsonii</i>	Johnson's bee-hive cactus	None/ None/ 2.3	Mojavean desert scrub(granitic)/ perennial stem succulent/ Apr-May/ 1640-3937
<i>Sclerocactus polyancistrus</i>	Mojave fish-hook cactus	None/ None/ 4.2	Great Basin scrub, Joshua tree "woodland", Mojavean desert scrub/usually carbonate/ perennial stem succulent/ Apr-Jul/ 2100-7612
<i>Scleropogon brevifolius</i>	burro grass	None/ None/ 2.3	Mojavean desert scrub(decomposed granitic)/ perennial stoloniferous herb/ Oct/ 5200-5249
<i>Scutellaria bolanderi</i> ssp. <i>austromontana</i>	southern mountains skullcap	None/ None/ 1B.2	Chaparral, Cismontane woodland, Lower montane coniferous forest/mesic/ perennial rhizomatous herb/ Jun-Aug/ 1394-6562
<i>Sedum niveum</i>	Davidson's stonecrop	None/ None/ 4.2	Lower montane coniferous forest, Subalpine coniferous forest, Upper montane coniferous forest/rocky/ perennial rhizomatous herb/ Jun-Aug/ 6808-9843
<i>Selaginella asprella</i>	bluish spike-moss	None/ None/ 4.3	Cismontane woodland, Lower montane coniferous forest, Pinyon and juniper woodland, Subalpine coniferous forest, Upper montane coniferous forest/granitic, rocky/ perennial rhizomatous herb/ Jul/ 5249-8858
<i>Selaginella leucobryoides</i>	Mojave spike-moss	None/ None/ 4.3	Great Basin scrub, Lower montane coniferous forest, Mojavean desert scrub, Pinyon and juniper woodland/rocky, usually carbonate/ perennial rhizomatous herb/ Jun/ 1969-10335
<i>Senecio aphanactis</i>	chaparral ragwort	None/ None/ 2.3	Chaparral, Cismontane woodland, Coastal scrub/sometimes alkaline/ annual herb/ Jan-Apr/ 49-2625
<i>Senecio astephanus</i>	San Gabriel ragwort	None/ None/ 4.3	Coastal bluff scrub, Chaparral/rocky slopes/ perennial herb/ May-Jul/ 1312-4921
<i>Senna covesii</i>	Coves' cassia	None/ None/ 2.3	Sonoran desert scrub(sandy)/ perennial herb/ Mar-Jun/ 935-3510
<i>Sidalcea hickmanii</i> ssp. <i>parishii</i>	Parish's checkerbloom	None/ SR/ 1B.2	Chaparral, Cismontane woodland, Lower montane coniferous forest/ perennial herb/ Jun-Aug/ 3281-8199

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Sidalcea malviflora</i> ssp. <i>dolosa</i>	Bear Valley checkerbloom	None/ None/ 1B.2	Lower montane coniferous forest(meadows and seeps), Meadows and seeps, Riparian woodland, Upper montane coniferous forest(meadows and seeps)/ perennial herb/ May-Aug/ 4905-8809
<i>Sidalcea neomexicana</i>	salt spring checkerbloom	None/ None/ 2.3	Chaparral, Coastal scrub, Lower montane coniferous forest, Mojavean desert scrub, Playas/alkaline, mesic/ perennial herb/ Mar-Jun/ 49-5020
<i>Sidalcea pedata</i>	bird-foot checkerbloom	FE/ SE/ 1B.1	Meadows and seeps(mesic), Pebble plain/ perennial herb/ May-Aug/ 5249-8202
<i>Sidothea caryophylloides</i>	chickweed oxythea	None/ None/ 4.3	Lower montane coniferous forest(sandy)/ annual herb/ Jul-Sep/ 3655-8530
<i>Sisyrinchium longipes</i>	timberland blue-eyed-grass	None/ None/ 2.3	Meadows and seeps/mesic/ perennial herb/ Jun-Aug/ 6759-6759
<i>Sphaeralcea rusbyi</i> var. <i>eremicola</i>	Rusby's desert-mallow	None/ None/ 1B.2	Joshua tree "woodland", Mojavean desert scrub/ perennial herb/ Mar-Jun/ 3199-5397
<i>Sphenopholis obtusata</i>	prairie wedge grass	None/ None/ 2.3	Cismontane woodland, Meadows and seeps/mesic/ perennial herb/ Apr-Jul/ 984-6562
<i>Stipa arida</i>	Mormon needle grass	None/ None/ 2.3	Joshua tree "woodland", Pinyon and juniper woodland/carbonate/ perennial herb/ May-Jul/ 1640-8432
<i>Stipa divaricata</i>	small-flowered rice grass	None/ None/ 2.3	Pinyon and juniper woodland(gravelly, carbonate)/ perennial herb/ Jun-Sep/ 2297-9678
<i>Streptanthus bernardinus</i>	Laguna Mountains jewel-flower	None/ None/ 4.3	Chaparral, Lower montane coniferous forest/ perennial herb/ May-Aug/ 2198-8202
<i>Streptanthus campestris</i>	southern jewel-flower	None/ None/ 1B.3	Chaparral, Lower montane coniferous forest, Pinyon and juniper woodland/rocky/ perennial herb/ (Apr),May-Jul/ 2953-7546
<i>Symphotrichum defoliatum</i>	San Bernardino aster	None/ None/ 1B.2	Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Meadows and seeps, Marshes and swamps, Valley and foothill grassland(vernally mesic)/near ditches, streams, springs/ perennial rhizomatous herb/ Jul-Nov/ 7-6693
<i>Symphotrichum greatae</i>	Greata's aster	None/ None/ 1B.3	Broadleaved upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Riparian woodland/mesic/ perennial rhizomatous herb/ Jun-Oct/ 984-6594
<i>Syntrichopappus lemmonii</i>	Lemmon's syntrichopappus	None/ None/ 4.3	Chaparral, Joshua tree "woodland", Pinyon and juniper woodland/sandy or gravelly/ annual herb/ Apr-May(Jun),/ 1640-6004
<i>Taraxacum californicum</i>	California dandelion	FE/ None/ 1B.1	Meadows and seeps(mesic)/ perennial herb/ May-Aug/ 5315-9186
<i>Tetracoccus hallii</i>	Hall's tetracoccus	None/ None/ 4.3	Mojavean desert scrub, Sonoran desert scrub/ perennial deciduous shrub/ Jan-May/ 98-3937
<i>Tetradymia argyraea</i>	striped horsebrush	None/ None/ 4.3	Pinyon and juniper woodland(rocky)/ perennial deciduous shrub/ (May),Jun-Sep/ 4593-7316
<i>Teucrium glandulosum</i>	desert germander	None/ None/ 2.3	Sonoran desert scrub(rocky)/ perennial stoloniferous herb/ Apr-May/ 1312-2592

APPENDIX 4A-4B (Continued)

Plant Species Known to Occur in San Bernardino County

Scientific Name	Common Name	Status (Federal/ State/ CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)
<i>Thelypodium stenopetalum</i>	slender-petaled thelypodium	FE/ SE/ 1B.1	Meadows and seeps(mesic, alkaline)/ perennial herb/ May-Sep/ 5249-8202
<i>Thelypteris puberula</i> var. <i>sonorensis</i>	Sonoran maiden fern	None/ None/ 2.3	Meadows and seeps(seeps and streams)/ perennial rhizomatous herb/ Jan-Sep/ 164-2001
<i>Thysanocarpus rigidus</i>	rigid fringe-pod	None/ None/ 1B.2	Pinyon and juniper woodland/Dry rocky slopes/ annual herb/ Feb-May/ 1969-7218
<i>Tiquilia canescens</i> var. <i>pulchella</i>	Chocolate Mountains tiquilia	None/ None/ 3.2	Sonoran desert scrub/sometimes slopes, ridges, or washes/ perennial shrub/ Feb-May/ 820-2297
<i>Tragia ramosa</i>	desert tragia	None/ None/ 4.3	Chenopod scrub, Pinyon and juniper woodland/rocky/ perennial herb/ Apr-May/ 2953-6102
<i>Trichostema micranthum</i>	small-flowered bluecurls	None/ None/ 4.3	Lower montane coniferous forest, Meadows and seeps/mesic/ annual herb/ Jun-Sep/ 5003-7546
<i>Tripterocalyx micranthus</i>	small-flowered sand-verbena	None/ None/ 2.3	Desert dunes, Mojavean desert scrub(sandy)/ perennial herb/ Apr-May/ 1804-2805
<i>Viola pinetorum</i> var. <i>grisea</i>	grey-leaved violet	None/ None/ 1B.3	Meadows and seeps, Subalpine coniferous forest, Upper montane coniferous forest/ perennial herb/ Apr-Jul/ 4921-11155
<i>Viola purpurea</i> ssp. <i>aurea</i>	golden violet	None/ None/ 2.3	Great Basin scrub, Pinyon and juniper woodland/sandy/ perennial herb/ Apr-Jun/ 3281-8202
<i>Wislizenia refracta</i> ssp. <i>refracta</i>	jackass-clover	None/ None/ 2.3	Desert dunes, Mojavean desert scrub, Playas, Sonoran desert scrub/ annual herb/ Apr-Nov/ 1969-2625
<i>Woodsia plummerae</i>	Plummer's woodsia	None/ None/ 2.3	Pinyon and juniper woodland(granitic, rocky)/ perennial rhizomatous herb/ May-Sep/ 5249-6562
<i>Xanthisma gracile</i>	annual bristleweed	None/ None/ 4.3	Joshua tree "woodland", Mojavean desert scrub/ annual herb/ Apr-Jul(Sep),/ 4003-5102

Status Legend:

FE: Federally listed as endangered

FT: Federally listed as threatened

FC: Federal Candidate for listing

SE: State listed as endangered

ST: State listed as threatened

SR: State Rare

CRPR 1A: Plants presumed extinct in California

CRPR List 1B: Plants rare, threatened, or endangered in California and elsewhere

CRPR List 2: Plants rare, threatened, or endangered in California but more common elsewhere

CRPR List 3: Plants about which more information is needed – a review list

CRPR List 4: Plants of limited distribution – a watch list

1 Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)

2 Fairly endangered in California (20% to 80% of occurrences threatened)

3 Not very endangered in California (less than 20% of occurrences threatened or no current threats known).