MAPPING PLANT BIODIVERSITY HOTSPOTS AT THE COUNTY SCALE:
A NEW TOOL FOR ESTABLISHING RESOURCE CONSERVATION STRATEGIES

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ABSTRACT

Mapping Plant Biodiversity Hotspots at the County Scale: A New Tool for Establishing Resource Conservation Strategies

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Myers first identified the world's 25 biodiversity hotspots and pioneered innovative ideas about the usefulness of biodiversity models for establishing long-term resource conservation strategies at global scales. Since Myers, most of the subsequent studies using hotspot science for biodiversity modeling have used large spatial scales like countries, provinces or states, and other biogeographic regions. The California Floristic Province continues to be one of the recognized global biodiversity hotspots. Our study site, San Luis Obispo County is within this hotspot and we created a map of plant biodiversity hotspots at the county scale using GIS technology. We wanted to determine the effectiveness and applicability of biodiversity hotspot mapping at this scale with anticipation that the map will serve as a new tool for establishing long-term resource conservation strategies in the County. Our plant biodiversity hotspot map is based on distribution data collected from herbarium specimens of San Luis Obispo County's rare flora. These data were extracted from the Hoover Herbarium at Cal Poly and manually digitized into GIS. We built a model with GIS to identify, locate, and quantify the resultant hotspots from the data. The overall approach was successful at identifying and quantifying the attributes and geographic extents of plant biodiversity hotspots at the county scale. Our results are highly applicable for establishing local and regional plant conservation priorities at lower resolutions, which is frequently where land acquisition and reserve establishment occurs. We conclude that biodiversity hotspot modeling with GIS is an effective tool that can be applied to many other finer-scale biological inventories for conservation purposes.

Index terms: biodiversity hotspot, endemism, rarity, geographic information system (GIS)

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GENERAL INTRODUCTION

The intention of this chapter is to provide some additional insight into why I wanted to conduct this research and to explain the overall organization of my thesis project. I have worked as a botanist for environmental consulting firms for more than eight years. My primary duties as a consulting botanist are to help facilitate accordance with the current state and federal regulations that pertain to botanical and biological resources for a variety of private, county, and city development, restoration, and infrastructure projects. This experience has been valuable and certainly educational.

However on many levels, my consulting experience increased my awareness regarding the vast differences between the academic environment and the body of scientific theories associated with conservation biology and ecology and the various ways such disciplines are actually being practiced in the professional fields of natural resource management and regional planning. Ideally, conservation policies and practices should be based on well-supported scientific data analyses and the resultant principles. Unfortunately, my experiences have made it apparent that this is frequently not the case. Often natural resource management and regional planning decisions are more heavily based on the current political climates and agendas of their jurisdictions and are also typically dictated by their existing economic constraints and limitations. In theory, conserving biodiversity is straightforward, but in practice it is convoluted, nebulous, and seemingly distant from the everyday mandated practices, policies, and procedures generally employed by planning departments and natural resource agencies. The various differences I observed between the theory and practice of conservation biology and

ecology in my professional and academic pursuits were a fundamental inspiration for this project. I wanted to create something practical and functional that I could give to my community and to the pertinent resource agencies that is based on modern scientific analysis for use in the formation of planning strategies for regional plant conservation.

Chapter 1 provides the background information and literature review for this thesis project. It begins by providing a working definition of biodiversity because it is a fundamental concept to both ecology and conservation biology and the basis of the project. The next section of this chapter discusses the history, uses, and current developments of biodiversity hotspot science because this discipline and approach provide the primary framework of this analysis. The California Floristic Province is one of the currently recognized global biodiversity hotspots (Williams et al. 2011). After the discussion on hotspot science, Chapter 1 provides some of the reasons the California Floristic Province is a global biodiversity hotspot and introduces several of its unique characteristics and attributes. Chapter 1 concludes with an introduction to our study site, San Luis Obispo County. The last section of Chapter 1 discusses the natural history, geology, and introduces the floristic diversity of San Luis Obispo County.

Chapter 2 addresses and explains the more technical aspects of this work. The Chapter begins by presenting the four research questions we sought to answer with our analysis. The next section of the chapter discusses the methods we used to answer these research questions. It is broken up into several components that more or less parallel the timeline and trajectory that the research was conducted. We explain that the dataset used

for this research was distribution data for the rare flora of San Luis Obispo County and that these data were collected from the Hoover Herbarium at California Polytechnic State University San Luis Obispo. We discuss the process of how we digitized the collection location data into GIS, how we designed our model to identify the plant biodiversity hotspots, and the other technical aspects of the mapping procedures associated with the project. After the methods, Chapter 2 presents our results. We successfully identified seven plant biodiversity hotspot areas in San Luis Obispo County and the various attributes of the hotspots are discussed individually. The chapter concludes with a thorough discussion of our results. The discussion states that our model was based on species richness, rarity, and endemism; while more traditional hotspot models are based on species richness, endemism, and degree of threat. We discuss some of the differences between these two approaches and why ours utilized rarity instead of degree of threat. We also discuss the significance of the scale we used for the analysis, which is a county scale. Chapter 2 concludes with an examination of how our results could potentially be used to form long-term regional conservation strategies.

I. BACKGROUND AND LITERATURE REVIEW

This chapter presents the background information associated with this project and includes a thorough literature review of the body of existing work associated with our research. The chapter is divided into the following sections: biodiversity, hotspot science, the California Floristic Province, and San Luis Obispo County, which is our study site. Noticeably, the material presented in this chapter is initially quite broad and then progressively narrows in scope to a local county scale. We presented the material in this way intentionally because the scale of biodiversity analyses is a prominent theme that permeates this work.

BIODIVERSITY

While seemingly fundamental to the study of biology, the term biodiversity was coined fairly recently and became popularized within the scientific literature about 20 years ago (Harper and Hawksworth 1994). Its literal meaning- the diversity of life, is relatively simple in comparison to what the word has come to represent; the whole of biological complexity spanning from the level of individual genes across a myriad of scales up to the level of ecosystems and the abiotic processes associated with them (Freeman 2008; Melchias 2001; Ferrier 2002). As a result of this broad definition, it is paramount to define the particular scale at which biodiversity is being addressed. Biodiversity measures and analyses are typically conducted at the genetic, species, or ecosystem-level of organization.

Biodiversity has incredible value to humanity because it is fundamental to our understanding of the totality of life on Earth and to our abilities to find solutions to some of the most challenging global problems we currently face; such as overpopulation, global climate change, and the perceived extinction crisis (Raven et al. 2011 and Thomas et al. 2004). Yet, it is estimated that more than 86% of terrestrial species and 91% of aquatic species have not yet been described by science and are awaiting discovery (Mora et al. 2011). We value biodiversity for numerous reasons that are often grouped into several interrelated categories. These include: ethical reasons such as intrinsic worth, notions of environmental stewardship, spirituality, and esthetics; direct and indirect economic values that range from food sources, medicines, and natural resources like timber, natural gas, and minerals, to furnishing humanity with a healthy environment, clean air and water, and sustained economic productivity; and essential ecosystem services such as pollination, perpetuation of nutrient cycling, decomposition and detoxification of waste products and pollutants, and ongoing maintenance of critical environmental thresholds such as flood protection, disease prevention, pest control, and climate regulation (Ehrlich and Ehrlich 1992; Duffy 2009; Farber et al. 2002; Boyd and Banzhaf 2007; Groot et al. 2002). For these reasons, biodiversity became a focus for global conservation where the underlying goal was to identify geographic regions that harbor high amounts of biodiversity in order to protect and preserve them as a means of offsetting the rate of species extinctions and habitat loss worldwide (Melchias 2001).

HOTSPOT SCIENCE

Biodiversity concepts continued to provide a practical framework for conservation planning and prioritization and these efforts ultimately led to a seminal publication that identified 25 global biodiversity hotspots (Myers et al. 2000). This map is presented as **Figure 1**. The hotspots were defined as geographic areas that have high species richness, exceptionally high concentrations of endemic species, which also face an alarming degree of threat from habitat loss (Myers 1988). It is important to recognize that hotspot science is based upon species distribution datasets and that these data are the fundamental source of all hotspot models. Similarly, the distributions and status of plant species have been and continue to be the primary baseline indicators for hotspot science as opposed to some other taxonomic group. This is because plant species distributions are the most known and have been well documented historically (Myers 1988; Myers 1990; Myers et al. 2000; Mittermeier et al. 2001). The global biodiversity hotspot analyses have been periodically refined and now 35 total hotspots are recognized worldwide (Williams et al. 2011). Hotspot science has had a tremendous impact on conservation biology, governmental policies, and land use planning since its inception and it has generated more than \$750 million for global conservation efforts since its development. This the most significant sum ever allocated towards a single conservation strategy (Myers 2003).

Figure 1. Myers 25 Global Biodiversity Hotspots. This map first appeared in the journal *Nature* in the year 2000. The publication of this article brought worldwide attention to biodiversity analyses and hotspot science, which forever changed how we approach and formulate global resource conservation strategies (Myers et al. 2000).

CALIFORNIA FLORISTIC PROVINCE

One of the global biodiversity hotspots identified by Myers that continues to satisfy the existing hotspot criteria is the California Floristic Province (CA-FP or Province). After the initial hotspot publication, which emphasized biodiversity hotspots within tropical forest ecosystems (Myers 1988), the researchers expanded their criteria and required that hotspots have a more substantial proportion of endemic plant species. They required that the hotspots consist of at least 0.5% of all plant species known to science, or at minimum 1,500 endemic vascular plant species (Myers 1990; Zachos and Habel 2011). With this new requirement several hotspots from Mediterranean eco-regions were added to the global biodiversity hotspot list, including the CA-FP. The Province is considered one of the most genetically complex eco-regions in the world and it is the largest geographic subdivision recognized in California (Calsbeek et al. 2003 and Baldwin et al. 2012). The CA-FP currently ranks 20th among the recognized global biodiversity hotspots in terms of total numbers of endemic plant and vertebrate genera. It has 52 endemic plant and four endemic vertebrate genera (Mittermeier et al. 2004 and Williams et al. 2011). Its original geographic extent is estimated to be 293,804 square kilometers (113,438 square miles) in size. Of this approximately 73,451 square kilometers (28,359 square miles or roughly 25%) of the original vegetation remains in what is considered a relatively undisturbed condition. The CA-FP biodiversity hotspot includes: approximately 7,030 vascular plant species total; of these 2,124 are considered endemics. The CA-FP also has four endemic and threatened birds, five endemic and threatened mammals, and eight endemic and threatened amphibians that collectively contribute to its status as a global biodiversity hotspot. Two species are thought to have

gone extinct within this hotspot since the year 1500 (Conservation International 2012 and Mittermeier et al. 2004).

The CA-FP comprises about 70% of the state of California. It extends beyond the California boundaries north into southwestern Oregon, slightly east into the western-most corner of Nevada, and south into northern Baja. The Province occupies all of what is referred to as ‘cismontane’ California, which is the entire geographic region that occurs west of the crests of the Sierra Nevada and Cascade mountain ranges, north of the crests of the Transverse Ranges, and west over the Peninsular Ranges. Two other floristic provinces occur to the east, outside the boundary of the CA-FP; the Great Basin Province (GB-FP) and the Desert Province (D-FP) and these two regions collectively occupy what is referred to as ‘transmontane’ California. The GB-FP is located within the northeastern two-thirds of California, east of the crest of the Sierra Nevadas and the D-FP occurs within the southeastern third of the state (Baldwin et al. 2012; Holland and Keil 1995; Raven and Axelrod 1978). Within California exclusively, the Province is further subdivided into six distinct geographic regions, 17 sub-regions, and 18 districts that compose a complete hierarchical system that is widely used by scientists and researchers to communicate about the diverse vegetation and geography within this massive state (Baldwin et al. 2012).

SAN LUIS OBISPO COUNTY

Our study site, San Luis Obispo County (SLO Co. or County) is located within the CA-FP biodiversity hotspot. A map of the County of San Luis Obispo within the

context of the CA-FP is presented as **Figure 2** below. It occurs within both the Central Western (CW) and Great Valley (GV) California geographic regions and includes portions of both the outer and inner South Coast Ranges (SCoR) district as well as portions of the San Joaquin Valley (SnJV) district (Baldwin et al. 2012). The County is approximately 9,365 square kilometers (3,616 square miles) in size and has about 161 kilometers (100 miles) of coastline. SLO Co. is bordered by Kings and Monterey counties to the north, Kern County to the east, Santa Barbara County to the South, and the Pacific Ocean to the west. The highest elevation in the County is approximately 1,556 meters (5,106 feet) and it occurs at the top of Caliente Peak, which is located in the southeastern corner.

In general, SLO Co. has a Mediterranean climate, where most of the rainfall occurs during the winter months and the summer months are warm and dry. However, the western portions of the County are strongly influenced by the Pacific Ocean and the eastern portions exhibit more desert-like climatic cycles. On average SLO Co. receives about 50 centimeters (22 inches) of precipitation annually (Holland and Keil 1995). However, the annual amount of rainfall it receives is highly variable from year to year. Approximately 269,637 people live within the County and like the global population, this number is increasing (United States Census Bureau 2010).

SLO Co. has a dynamic geologic history consisting of 15 distinct stratigraphic units known to occur within it (Chipping 1987 and Jennings et al. 2010). The County has an abundance of serpentine rock outcrops and other ultramafic formations.

Figure 2. San Luis Obispo County Within the Context of the California Floristic Province. The red star indicates the approximate central location of the County within the Province. (*Image source unresolved- personal communications and lecture materials from Dr. Ritter and Dr. Keil).

These formations have had a dramatic edaphic effect on the plant assemblages associated with them. The serpentinite formations within SLO Co. support numerous rare and endemic plant species and novel plant communities (Kruckeberg 1984; Holland and Keil 1995; Harrison and Inouye 2002; and Barbour et al. 2007). Three different fault zones occur within SLO Co.; the San Simeon Fault, the Los Osos Fault, and the infamous San Andreas Fault, which is why it is still considered a seismically active region (San Luis Obispo Planning and Building Department 2012). Another distinct geologic feature within SLO Co. that is associated with seismic activity is the morros. The morros, also called the seven (occasionally nine) sisters are a linear chain of volcanic mountains located inland from Morro Bay that trend in a southeastern direction. The morros are another example of the County's distinctive geology that characterizes the region (Dickerson 1990).

The County has several mountain ranges that provide a considerable amount of topographic variation and facilitate the many microclimates that exist throughout it. In general, all of the County's mountain ranges trend in a northwest to southeast direction. The largest mountain range in SLO Co. is the Santa Lucia Range which is located primarily in the western half of the County. The San Luis Range is much smaller, generally located southwest of the City of San Luis Obispo. The more inland mountain ranges include the La Panza Range, the Caliente Range, and the Temblor Range. The La Panza Range is the most centrally located, situated northeast of the unincorporated community of Pozo. Southeast of the La Panzas is the Caliente Range and it is more or less adjacent to the eastern half of Route 166, until it flattens out into the Cuyama Valley.

State Route 166 is also the southern boundary of SLO Co. The most interior mountain range in the County is the Temblor Range which is located intermittently within the northeastern boundaries of SLO Co. Like its many mountain ranges, the County has an abundance of lakes and drainages. The largest river in SLO Co. is the Salinas, more or less bisecting the County from north to south until it is diverted at Santa Margarita Lake. The County has several large-sized coastal streams that flow west from the interior uplands and outlet directly into the Pacific Ocean. The Santa Maria/Cuyama River flows east to west and parallels Route 166 along the southern boundary of SLO Co. There are numerous other smaller waterways throughout the County that create a matrix of watersheds throughout the landscape. One of the other most prominent natural features within SLO Co. is Soda Lake. This lake is an endorheic, or closed alkaline lake, that is situated in the middle of the Carrizo Plain. This lake is a dry, lowland enclosure between the Temblors and the La Panza and Caliente Ranges. Surface waters from the adjacent mountains flow into the Carrizo Plain and because it does not have an outlet, the waters accumulate within Soda Lake until they eventually evaporate and the salty sediments remain (Hoover 1970 and Holland and Keil 1995). A map from Hoover (1970) of the County that illustrates the approximate locations of the major mountain ranges and streams is presented as **Figure 3**.

The combined edaphic, topographic, and climatic heterogeneity found in SLO Co. has given rise to a more diverse and speciose regional flora than the County's size suggests. A topographic map of SLO Co. is provided as **Figure 4** to illustrate the amount of relief over the terrain and heterogeneity that occurs throughout the County. Most generally speaking, the combined influences of climate, geology, and topography are responsible for the amount of plant diversity observed throughout SLO Co. (Hoover 1970; Holland and Keil 1995; Ritter 2006; and Raven and Axelrod 1978).

Approximately 2,889 plant taxa occur within SLO Co. (Calflora Database 2012). Of these, 1,850 are considered native plant taxa; meaning that they existed in California before European contact, which is generally thought to have occurred in the late 1700s (Ritter 2006 and Ritter 2012). The County has 214 special status plant taxa that are afforded protection by the various resource agencies and 25 are endemic solely to the County. It ranks seventh in the state in terms of the number of special status plant taxa per county (CNPS 2012a). A diverse and unusual variety of plant communities occur in SLO Co. The following generalized plant communities occur within the County, but this list is by no means an exhaustive vegetation classification: beach strand, coastal dune, coastal salt marsh, dune scrub, coastal scrub, maritime chaparral, coastal prairie, freshwater marsh, riparian woodland, chaparral, oak woodland, non-native and perennial grasslands, closed-cone coniferous forest, mixed evergreen forest, desert scrub, desert woodland, alkali sink, vernal pool, saltbush scrub, and urban/ruderal/developed (Ritter 2006; Holland and Keil 1995; Hoover 1970; Barbour et al. 2007; and Sawyer et al. 2009).

Figure 4. Topographic Map of San Luis Obispo County, California. Basemap: ESRI Online, US Geologic Survey Topographic Maps of the United States, 2010.

The California Department of Fish and Game (CDFG) recognize 13 designated rare vegetation communities within SLO Co. Yet the amount of plant diversity and distinct vegetative assemblages contained within this distance far surpasses reasonable expectation because there are numerous other places throughout California where one could conduct the same length transect and only encounter a few limited types of vegetation. According to Hoover, regarding the flora of SLO Co., "...diversity is the rule...The difference in environmental conditions is greater than this distance would suggest. It would be hard to find a more marked contrast than that between the cool damp north coast and the intensely hot and arid Cuyama Valley" (Hoover 1970). An aerial photograph flown in 2009 is presented as **Figure 5** to illustrate the extent and variety of the vegetation communities within SLO Co.

II. HERBARIUM, GIS, MODELING, AND MAPPING PLANT BIODIVERSITY HOTSPOTS IN SAN LUIS OBISPO COUNTY

This chapter presents the various technical aspects of this work. First, it presents the four research questions we addressed. It explains the methodologies we used starting in the Herbarium, during the digitization phase of the project, how we designed the model to identify the plant biodiversity hotspots, and while mapping. After the methods, this chapter presents our results. The results section is followed by a discussion where we emphasize how our analysis varies from other hotspot studies and reiterates the significance and novelty of using a county scale. The chapter closes with an explanation of how we hope to use our results in collaboration with other local and regional resource entities to develop long-term resource conservation strategies.

RESEARCH QUESTIONS

Here we address four primary questions that are pertinent to biodiversity hotspot modeling: 1) Where are the plant biodiversity hotspots in SLO Co.; 2) Can we use the geographic information system (GIS)-based model we developed to detect them; 3) Is hotspot science methodology applicable at the county scale; and 4) Can it be used to develop regional resource conservation strategies?

METHODS

Herbarium

We queried three scientific databases to obtain comprehensive lists of all the special status plant species considered to occur within San Luis Obispo County by the

pertinent resource agencies. These include: the California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Plants (CNPS 2012a), the CDFG California Natural Diversity Database (CNDDB) RareFind (CDFG 2003), and the United States Fish and Wildlife Service's (USFWS) Information, Planning, and Conservation (IPaC) Online System (USFWS 2012). The results of these various scientific database queries are presented as **Appendix A**. Then we compiled the scientific database query results into a single table that includes general information about the nomenclature, regulatory status, distributions, habitat requirements, and phenology of the special status plants that occur in SLO Co. (**Appendix B**).

Recent nomenclatural changes became a source of confusion because the resource agencies have not yet fully accepted the treatments published within the new edition of the Jepson Manual because several of the taxa are no longer recognized as distinct entities, which could potentially result in them not being recognized as having special status. The release of the new Jepson Manual has initiated a statewide status review of all the special status plants in California and the process is likely to going to take multiple years to complete (CNPS 2012b and Baldwin et al. 2012). CNPS has begun the status review process, but each species must be evaluated on a case-by-case basis. We have attempted to the maximum extent feasible to stay up to date on the status review as this information becomes available. CNPS in particular, may continue to recognize certain taxa under the former first edition treatments (Hickman 1993) and it is the lead agency spearheading the statewide status review. In order to address these issues, we use the

name given to the taxon that is afforded special regulatory status and have included the new names as well, if applicable.

We collected distribution data for the County's rare flora from the Hoover Herbarium (OBI) at the California State Polytechnic University, San Luis Obispo (Cal Poly) and utilized all of the available specimens for these special status plants within the OBI collections. We entered the accession number, collector(s), geographic location information, and collection date from each herbarium specimen label into a database and also took a digital photograph of each specimen. Several taxa did not have any collections within the herbarium and a few others were checked out on loan to other institutions or independent researchers. We were able to collect data for 177 of the 214 special status taxa (83%) and compiled the distribution information from 1599 total available specimens. The minimum number of specimens digitized for any taxon was one; several taxa had only one or two specimens. The maximum number of specimens digitized for any taxon was 41 specimens. The 37 taxa that are not represented comprise approximately 17% of the County's rare flora. The family name, scientific name, common name, and regulatory status of each of the 37 taxa not included in the study are presented in **Appendix C**.

Weighted Value Scheme

Some of the taxa included in the study are rarer than others and are therefore afforded a greater level of protection from the resource agencies. For example, in the CNPS listing system a California Rare Plant Rank (CRPR) List 4 species is not nearly as

rare as a List 1B species. Taxa may be recognized by multiple resource agencies simultaneously. Marsh sandwort (*Arenaria paludicola*) for example is a CRPR List 1B.1 taxon, is federally endangered, and is listed as endangered by the state of California. We wanted to account for this inherent variability of status in our study and wanted to integrate rarity into the biodiversity hotspot model. To do so we created a weighted value scheme for the data and assigned a particular score to each taxon according to the various levels of special status that it has been assigned. If a taxon is listed by multiple agencies the total score given to it in the weighted value scheme is the sum of all the point values. According to the scheme state and/or federally listed taxa are given five points. If a taxon is endemic to SLO Co.; meaning that its distribution is confined to a reduced geographical area and it only occurs within the County, that taxon was given three additional points. Plant species designated as CRPR List 1B taxa were given four points, List 2 taxa were given three, List 3 were given two, and List 4 were given one point. The weighted value scheme we used is summarized below in **Table 1**.

Table 1. Biodiversity Hotspot Weighted Value Scheme. The various point values are allocated to each special status taxon individually for every level of status it is afforded.

Status	Points
State/Federally- Listed CR, CT, CE and FT, FE	5
Endemic to San Luis Obispo County (Occurs only within boundaries of County)	3
CRPR 1B Plants rare, threatened or endangered in CA and elsewhere	4
CRPR 2 Plants rare, threatened or endangered in CA but more elsewhere	3
CRPR 3 Plants about which more information is required, A review list	2
CRPR 4 Plants of limited distribution, A Watch List	1

GIS and Digitizing

We entered and managed the data with Geographic Information System (GIS) software by Environmental Systems Research Institute (ESRI) Inc., in ArcMap - ArcGIS Desktop Version 10 (ESRI 2011). We digitized, or digitally mapped, the geographic locations of all the herbarium specimens as stated on the herbarium labels by hand. We digitized the geographic locations as individual polygons and assembled these data into a single shapefile layer, titled specimens. As mentioned earlier, this information was previously compiled into a database for use during the digitization phase of the project. We used several background reference layers to assist in the mapping and to maximize the accuracy of the polygon placement in GIS. These include several data layers acquired from ESRI online: an aerial photograph flown in 2009, United States Geological Survey (USGS) Topographic Map, and Bing Road Map; and several data

layers obtained from the County and/or City of San Luis Obispo: County boundary, SLO Co. Public Lands Parcels layer, County Parcels layer, County Streams layer, County Roads layer, and SLO Co. Serpentine Soils layer. We also used *Durham's Place-Names of California's Central Coast* to assist in identification of historical places and other more cryptic geographical inferences encountered within the herbarium data (Durham 2000).

Building the Model

Once all the herbarium specimen location polygons were digitized, we used ModelBuilder, which is an analysis application in ArcMap to construct an automated model that was used to systematically organize the specimen data to identify and quantify the resultant plant biodiversity hotspots. Two basic spatial analyst tools were used to build the model; dissolve and union. The dissolve tool aggregates features based on specified attributes. With our data it was used to take multiple herbarium records of a single taxon and merge them, or 'dissolve' them into a single layer for that taxon. The union tool computes a geometric 'union' of the input features and overwrites them as a new output feature class from the areas of polygon overlap based on the original input features. In other words, if there are two different polygon layers for two different taxa, taxon A and taxon B, respectively; the union tool identifies the areas where the taxa A and B polygons overlap. After recognition of the overlap, the union tool merges those polygons and then designates them as a new and unique output, feature class C in this scenario. Feature class C now includes the entire area previously mapped for the former taxa A and B, including the areas where those polygons overlap. In addition to these basic applications, the model was designed to integrate the weighted value scheme into

the analysis. As built, the model functions as an iterative process that systematically integrates the weighted value scheme to sum all values within areas of polygon overlap and this is how the model calculates and locates the biodiversity hotspots. A diagram of the complete model is presented in **Figure 6**. It takes approximately 18 seconds to run the model and obtain the results. When categorizing the results, we used the ESRI Natural Breaks default, which is five classes of diversity. We illustrated the classes of diversity on a primary color scale with the red class having the highest diversity and the darker green class having the lowest diversity. Once we ran the analysis and finalized the results, we constructed the plant biodiversity hotspot map for the County.

RESULTS

The model successfully identified seven plant biodiversity hotspots within the County (**Figure 7**). The hotspots have a cumulative weighted value of 40 to 108 points. Specifically, the red hotspot regions have a cumulative weighted value of 63 to 108 points and the orange hotspot regions have a cumulative weighted value of 40 to 63 points. The plant biodiversity hotspots were named by location or according to some other associated and characteristic geologic feature. In order from the most diverse to the least diverse, the plant biodiversity hotspots include the following: San Luis Obispo Region, Arroyo de La Cruz, Morro Bay Area, Big Coreopsis Hill, Red Hill Mesa, Indian Knob, and Carpenter Canyon. A summary of our results is presented in **Table 2** below, which includes the total number of taxa within each identified hotspot and the vegetation community types present within each hotspot. The hotspots are discussed individually with greater detail below.

Figure 6. Diagram of the Plant Biodiversity Hotspot GIS Model.

Figure 7. Plant Biodiversity Hotspots within San Luis Obispo County.

Table 2. Results Summary – Plant Biodiversity Hotspots Identified in San Luis Obispo County. The names, number of taxa, and community types present at each of the resultant hotspots are listed in the order from most diverse to least diverse.

Name of Hotspot	Number of Taxa	Community Type
San Luis Obispo Region	32	Serpentine chaparral, oak woodland, riparian, and serpentine perennial grassland
Arroyo de La Cruz	28	Maritime chaparral, coastal bluff grassland, and riparian
Morro Bay Area	23	Sand dunes, salt marsh, coastal scrub, and coastal dune scrub
Big Coreopsis Hill	20	Sand dunes and coastal dune scrub
Red Hill Mesa	13	Annual grassland, vernal pools, and oak woodland
Indian Knob	9	Annual grassland, oak woodland, chaparral, coastal scrub, and riparian
Carpenter Canyon	6	Oak woodland, chaparral, and coastal scrub

San Luis Obispo Region Hotspot

The San Luis Obispo Region hotspot is the most diverse hotspot identified in the study. A total of 32 special status taxa occur within this hotspot. **Table 3** provides the scientific name, common name, and regulatory status of the special status taxa that comprise the San Luis Obispo Region Hotspot. Please note: for sake of clarity and to avoid taxonomic confusion, the names utilized in each of the individual hotspot tables presented within the Results Section follow the taxonomy used by CNPS in the Online Inventory of Rare and Endangered Plants (CNPS 2012a). The vegetation communities present within the hotspot include serpentine and non-serpentine chaparral, oak woodland, riparian, coastal scrub, serpentine perennial grassland, and non-native grassland. All of the individual polygon areas within the collective San Luis Obispo Region hotspot are located on the west side of Interstate Highway 101 and the majority

occurs on serpentinite substrates. From the north to the south they include a small area on West Cuesta Ridge, Poly Canyon- which is part of the Cal Poly campus, areas associated with O'Conner Way, Laguna Lake Park, and the ridge-tops between Perfumo Canyon and See Canyon. The hotspot is named after the City of San Luis Obispo, which is located in close proximity to the various areas identified in this hotspot region. The San Luis Obispo Region hotspot is the most centrally located hotspot within the County. The total hotspot area detected in the analysis is approximately 241 hectares (595 acres, about one square mile). **Figure 8** is a map of the San Luis Obispo Region Plant Biodiversity Hotspot at a higher resolution.

Table 3. San Luis Obispo Region – Plant Biodiversity Hotspot. Summary of special status taxa that comprise the hotspot. The scientific and common names; federal, state, and CRPR status; and if the taxon is endemic is included. Please refer to Appendix B for specific status code information and abbreviations.

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Agrostis hooveri</i> Hoover's bent grass	NA	NA	1B.2	N
<i>Arctostaphylos cruzensis</i> Arroyo de la Cruz manzanita	NA	NA	1B.2	N
<i>Arctostaphylos morroensis</i> Morro manzanita	FT	NA	1B.1	Y
<i>Arctostaphylos obispoensis</i> bishop manzanita	NA	NA	4.3	N
<i>Arctostaphylos pechoensis</i> pecho manzanita	NA	NA	1B.2	N
<i>Arctostaphylos pilosula</i> Santa Margarita manzanita	NA	NA	1B.2	N
<i>Calandrinia breweri</i> Brewer's calandrinia	NA	NA	4.2	N
<i>Calochortus clavatus</i> var. <i>clavatus</i> club-haired mariposa lily	NA	NA	4.3	N
<i>Calochortus obispoensis</i> San Luis mariposa lily	NA	NA	1B.2	Y
<i>Calochortus simulans</i> La Panza mariposa lily	NA	NA	1B.3	N
<i>Calystegia subacaulis</i> ssp. <i>episcopalis</i> Cambria morning-glory	NA	NA	4.2	N
<i>Carex obispoensis</i> San Luis Obispo sedge	NA	NA	1B.2	N

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Castilleja densiflora</i> ssp. <i>obispoensis</i> San Luis Obispo owl's clover	NA	NA	1B.2	Y
<i>Centromadia parryi</i> ssp. <i>congdonii</i> Congdon's tarplant	NA	NA	1B.2	N
<i>Chlorogallum pomeridianum</i> var. <i>minus</i> dwarf soapplant	NA	NA	1B.2	N
<i>Chorizanthe brewerii</i> Brewer's spineflower	NA	NA	1B.3	N
<i>Chorizanthe palmeri</i> Palmer's spineflower	NA	NA	4.2	N
<i>Cirsium fontinale</i> var. <i>obispoense</i> San Luis Obispo fountain thistle	FE	CE	1B.2	Y
<i>Delphinium parryi</i> ssp. <i>eastwoodiae</i> Eastwood's larkspur	NA	NA	1B.2	Y
<i>Dudleya abramsii</i> ssp. <i>bettinae</i> Betty's dudleya	NA	NA	1B.2	Y
<i>Dudleya abramsii</i> ssp. <i>murina</i> mouse-gray dudleya	NA	NA	1B.3	Y
<i>Eleocharis parvula</i> small spikerush	NA	NA	4.3	N
<i>Layia jonesii</i> Jones' layia	NA	NA	1B.2	Y
<i>Lomatium parvifolium</i> small-flowered leptosiphon	NA	NA	4.2	N
<i>Monardella palmeri</i> Palmer's monardella	NA	NA	1B.2	N
<i>Perideridia pringlei</i> adobe yampah	NA	NA	4.3	N

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Pinus radiata</i> Monterey pine	NA	NA	1B.1	N
<i>Sanicula hoffmanii</i> Hoffmann's sanicle	NA	NA	4.3	N
<i>Sanicula maritima</i> adobe sanicle	NA	CR	1B.1	N
<i>Senecio aphanactis</i> San Gabriel ragwort	NA	NA	2.2	N
<i>Sidalcea hickmanii</i> ssp. <i>anomala</i> Cuesta Pass checkerbloom	NA	CR	1B.2	Y
<i>Streptanthus</i> <i>albidus</i> ssp. <i>peramoenus</i> most beautiful jewel-flower	NA	NA	1B.2	N

Figure 8. San Luis Obispo Region Plant Biodiversity Hotspot.

Arroyo de La Cruz Hotspot

Arroyo de La Cruz is the next most diverse hotspot identified in the study and 28 special status taxa occur within it. However, as indicated by the abundant area of red coloration in the hotspot, it has a higher weighted value than the other hotspots, which are predominantly orange in appearance. This is because the species composition of this hotspot is composed of more rare and endemic taxa. **Table 4** below provides the scientific name, common name, and regulatory status of the special status taxa that comprise the Arroyo de La Cruz Hotspot. The vegetation communities that compose this hotspot include maritime chaparral, coastal bluff grassland, and riparian. Arroyo de La Cruz is an intermittent stream carries flows from the Santa Lucia Range and empties into the Pacific Ocean on the west side of State Highway 1 and it is the most prominent feature that this hotspot was named after. The Arroyo de La Cruz hotspot occurs in the northwestern corner of the County. The total hotspot area detected in the analysis is approximately 637 hectares (1,575 acres or about 2.5 square miles) in size. **Figure 9** is a map of the Arroyo de La Cruz Plant Biodiversity Hotspot at a higher resolution.

Table 4. Arroyo de La Cruz – Plant Biodiversity Hotspot. Summary of special status taxa that comprise the hotspot. The scientific and common names; federal, state, and CRPR status; and if the taxon is endemic is included. Please refer to Appendix B for specific status code information and abbreviations.

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Allium hickmanii</i> Hickman's onion	NA	NA	1B.2	N
<i>Arctostaphylos cruzensis</i> Arroyo de La Cruz manzanita	NA	NA	1B.2	N

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Arctostaphylos hookeri</i> ssp. <i>hearstiorum</i> Hearst's manzanita	NA	CE	1B.2	Y
<i>Astragalus nuttallii</i> var. <i>nuttallii</i> ocean bluff milk-vetch	NA	NA	4.2	N
<i>Baccharis plummerae</i> ssp. <i>glabrata</i> San Simeon baccharis	NA	NA	1B.2	N
<i>Bloomeria humilis</i> dwarf goldenstar	NA	CR	1B.2	Y
<i>Calandrinia breweri</i> Brewer's calandrinia	NA	NA	4.2	N
<i>Calochortus clavatus</i> var. <i>recurvifolius</i> Arroyo de La Cruz mariposa lily	NA	NA	1B.2	Y
<i>Calochortus uniflorus</i> large-flowered mariposa lily	NA	NA	4.2	N
<i>Calystegia subacaulis</i> ssp. <i>episcopalis</i> Cambria morning-glory	NA	NA	4.2	N
<i>Carex obispoensis</i> San Luis Obispo sedge	NA	NA	1B.2	N
<i>Castilleja ambigua</i> ssp. <i>insalutata</i> no common name	NA	NA	1B.1	N
<i>Castilleja densiflora</i> ssp. <i>obispoensis</i> San Luis Obispo owl's clover	NA	NA	1B.2	Y
<i>Ceanothus hearstiorum</i> Hearst's ceanothus	NA	CR	1B.2	Y
<i>Ceanothus maritimus</i> maritime ceanothus	NA	CR	1B.2	Y

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Chorizanthe palmeri</i> Palmer's spineflower	NA	NA	4.2	N
<i>Cirsium occidentale</i> var. <i>compactum</i> compact cobwebby thistle	NA	NA	1B.2	N
<i>Corethrogyne leucophylla</i> branching beach aster	NA	NA	3.2	N
<i>Erigeron sanctarum</i> saint's daisy	NA	NA	4.2	N
<i>Lasthenia californica</i> ssp. <i>macrantha</i> perennial goldfields	NA	NA	1B.2	N
<i>Lomatium parvifolium</i> small-leaved lomatium	NA	NA	4.2	N
<i>Lotus formosissimus</i> harlequin lotus	NA	NA	4.2	N
<i>Microseris paludosa</i> marsh microseris	NA	NA	1B.2	N
<i>Monolopia gracilens</i> woodland woolythreads	NA	NA	1B.2	N
<i>Pedicularis dudleyi</i> Dudley's lousewort	NA	CR	1B.2	N
<i>Perideridia gairdneri</i> ssp. <i>gairdneri</i> Gairdner's yampah	NA	NA	4.2	N
<i>Sanicula hoffmannii</i> Hoffmann's sanicle	NA	NA	4.3	N
<i>Sanicula maritima</i> adobe sanicle	NA	CR	1B.1	N

Figure 9. Arroyo de La Cruz Plant Biodiversity Hotspot.

Morro Bay Area Hotspot

After Arroyo de La Cruz, the Morro Bay Area is the next most diverse hotspot. A total of 23 special status taxa occur within the Morro Bay Area. **Table 5** provides the scientific name, common name, and regulatory status of the special status taxa that comprise the Morro Bay Area Hotspot. There are three separate regions within this hotspot; a small polygon at the Sweet Springs Nature Preserve, the Morro Bay Sandspit, and another polygon that is located within Montaña de Oro State Park. The vegetation communities associated with this hotspot are sand dunes, salt marsh, coastal scrub, and coastal dune scrub. Morro Bay is a large and relatively pristine estuary. As such, it is subject to regular tidal influences and it is a highly dynamic wetland system where both fresh and salt waters mix and interact. Morro Bay is characteristic of this hotspot and is the feature attributed to this hotspot name. The Morro Bay Region hotspot is located in the western portion of the County, right along the coast. The total area detected in the analysis for the Morro Bay Area hotspot is approximately 437 hectares (1,079 acres or approximately 1.7 square miles). **Figure 10** is a map of the Morro Bay Area Plant Biodiversity Hotspot at a higher resolution.

Table 5. Morro Bay Area – Plant Biodiversity Hotspot. Summary of special status taxa that comprise the hotspot. The scientific and common names; federal, state, and CRPR status; and if the taxon is endemic is included. Please refer to Appendix B for specific status code information and abbreviations.

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Abronia maritima</i> red sand-verbena	NA	NA	4.2	N
<i>Arctostaphylos morroensis</i> Morro manzanita	FT	NA	1B.1	Y

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Arctostaphylos pechoensis</i> pecho manzanita	NA	NA	1B.2	N
<i>Calandrinia breweri</i> Brewer's calandrinia	NA	NA	4.2	N
<i>Ceanothus cuneatus</i> var. <i>fascicularis</i> Lompoc ceanothus	NA	NA	4.2	N
<i>Chenopodium littoreum</i> coastal goosefoot	NA	NA	1B.2	N
<i>Chloropyron maritimum</i> ssp. <i>maritimum</i> salt marsh bird's-beak	FE	CE	1B.2	N
<i>Cicuta maculata</i> var. <i>bolanderi</i> Bolander's water-hemlock	NA	NA	2.1	N
<i>Dithyrea maritima</i> beach spectaclepod	NA	CT	1B.1	N
<i>Eriodictyon altissimum</i> Indian Knob mountainbalm	FE	CE	1B.1	Y
<i>Erigeron blochmaniae</i> Blochman's leafy daisy	NA	NA	1B.2	N
<i>Erigeron sanctarum</i> saint's daisy	NA	NA	4.2	N
<i>Erysimum suffrutescens</i> suffrutescent wallflower	NA	NA	4.2	N
<i>Horkelia cuneata</i> var. <i>sericea</i> Kellogg's horkelia	NA	NA	1B.1	N
<i>Juncus acutus</i> ssp. <i>leopoldii</i> southwestern spiny rush	NA	NA	4.2	N
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i> Coulter's goldfields	NA	NA	1B.1	N

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Malacothrix incana</i> dunedelion	NA	NA	4.3	N
<i>Mucronea californica</i> California spineflower	NA	NA	4.2	N
<i>Poa diaboli</i> Diablo Canyon blue grass	NA	NA	1B.2	Y
<i>Prunus fasciculata</i> var. <i>punctata</i> sand almond	NA	NA	4.3	N
<i>Senecio aphanactis</i> San Gabriel ragwort	NA	NA	2.2	N
<i>Senecio blochmaniae</i> Blochman's ragwort	NA	NA	4.2	N
<i>Suaeda californica</i> California seablite	FE	NA	1B.1	N

Figure 10. Morro Bay Area Plant Biodiversity Hotspot.

Big Coreopsis Hill Hotspot

Big Coreopsis Hill is the next most diverse hotspot in the study and it has a total of 20 special status taxa within it. **Table 6** below provides the scientific name, common name, and regulatory status of the special status taxa that comprise the Big Coreopsis Hill Hotspot. The vegetation communities that occur within this hotspot are sand dunes and coastal dune scrub. The Big Coreopsis hotspot is located in the southwestern portion of the County, just slightly inland from the coast. Several separate polygons comprise the total hotspot area, which is approximately 42 hectares (104 acres or 0.2 square mile) in size. **Figure 11** is a map of the Big Coreopsis Hill Plant Biodiversity Hotspot at a higher resolution.

Table 6. Big Coreopsis Hill – Plant Biodiversity Hotspot. Summary of special status taxa that comprise the hotspot. The scientific and common names; federal, state, and CRPR status; and if the taxon is endemic is included. Please refer to Appendix B for specific status code information and abbreviations.

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Abronia maritima</i> red sand-verbena	NA	NA	4.2	N
<i>Astragalus nuttallii</i> var. <i>nuttallii</i> ocean bluff milk-vetch	NA	NA	4.2	N
<i>Chenopodium littoreum</i> coastal goosefoot	NA	NA	1B.2	N
<i>Cirsium occidentale</i> var. <i>compactum</i> compact cobwebby thistle	NA	NA	1B.2	N
<i>Cirsium rhothophilum</i> surf thistle	NA	CT	1B.2	N

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Cirsium scariosum</i> var. <i>loncholepis</i> La Graciosa thistle	FE	CT	1B.1	N
<i>Corethrogyne leucophylla</i> branching beach aster	NA	NA	3.2	N
<i>Delphinium gypsophilum</i> ssp. <i>gypsophilum</i> gypsum-loving larkspur	NA	NA	4.2	N
<i>Dithyrea maritima</i> beach spectaclepod	NA	CT	1B.1	N
<i>Erigeron blochmaniae</i> Blochman's leafy daisy	NA	NA	1B.2	N
<i>Horkelia cuneata</i> var. <i>sericea</i> Kellogg's horkelia	NA	NA	1B.1	N
<i>Leptodactylon californicum</i> ssp. <i>tomentosum</i> fuzzy prickly-phlox	NA	NA	4.2	N
<i>Lupinus nipomensis</i> Nipomo Mesa lupine	FE	CE	1B.1	Y
<i>Malacothrix incana</i> dunedelion	NA	NA	4.3	N
<i>Monardella undulata</i> curly-leaved monardella	NA	NA	4.2	N
<i>Mucronea californica</i> California spineflower	NA	NA	4.2	N
<i>Nasturtium gambelii</i> Gambel's water cress	FE	CT	1B.1	N
<i>Phacelia ramosissima</i> var. <i>austrolitoralis</i> south coast branching phacelia	NA	NA	3.2	N
<i>Prunus fasciculata</i> var. <i>punctata</i> sand almond	NA	NA	4.3	N

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Senecio blochmaniae</i> Blochman's ragwort	NA	NA	4.2	N

Figure 11. Big Coreopsis Hill Plant Biodiversity Hotspot.

Red Hill Mesa Hotspot

The Red Hill Mesa hotspot is one of the smallest hotspots identified in the study and it has 13 special status taxa within it. **Table 7** below provides the scientific name, common name, and regulatory status of the special status taxa that comprise the Red Hill Hotspot. The vegetation communities that occur within this hotspot are annual grassland, vernal pools, and oak woodland. The soils on the mesa are a unique type of well-drained clays that give them a characteristic red appearance. This hotspot occurs in the eastern portion of the County and it's located near the intersection of State Highway 58 and Red Hill Road. The Red Hill Mesa hotspot is approximately five hectares (12 acres or 0.02 square mile) in size. **Figure 12** is a map of the Red Hill Mesa Plant Biodiversity Hotspot at a higher resolution.

Table 7. Red Hill Mesa – Plant Biodiversity Hotspot. Summary of special status taxa that comprise the hotspot. The scientific and common names; federal, state, and CRPR status; and if the taxon is endemic is included. Please refer to Appendix B for specific status code information and abbreviations.

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Acanthomintha obovata</i> ssp. <i>cordata</i> heart-leaved thorn-mint	NA	NA	4.2	N
<i>Amsinckia douglasiana</i> Douglas' fiddleneck	NA	NA	4.2	N
<i>Calycadenia villosa</i> dwarf calycadenia	NA	NA	1B.1	N
<i>Castilleja densiflora</i> ssp. <i>obispoensis</i> San Luis Obispo owl's clover	NA	NA	1B.2	Y

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Caulanthus lemmonii</i> Lemmon's jewelflower	NA	NA	1B.2	N
<i>Chlorogalum purpureum</i> var. <i>reductum</i> Camatta Canyon amole	FT	CR	1B.1	Y
<i>Eschscholzia rhombipetala</i> diamond-petaled California poppy	NA	NA	1B.1	N
<i>Galium andrewsii</i> ssp. <i>gatense</i> phlox-leaved serpentine bedstraw	NA	NA	4.2	N
<i>Juncus luciensis</i> Santa Lucia dwarf rush	NA	NA	1B.2	N
<i>Layia heterotricha</i> pale-yellow layia	NA	NA	1B.1	N
<i>Lessingia tenuis</i> spring lessingia	NA	NA	4.3	N
<i>Madia radiata</i> showy golden madia	NA	NA	1B.1	N
<i>Malacothamnus jonesii</i>	NA	NA	4.3	N

Figure 12. Red Hill Mesa Plant Biodiversity Hotspot.

Indian Knob Hotspot

The Indian Knob hotspot is the next most diverse hotspot after Red Hill Mesa and 9 special status taxa occur within it. Like the Arroyo de La Cruz hotspot, Indian Knob has a portion of it that appears red; meaning that the taxa at this hotspot sum to a higher weighted value than the others that appear orange. **Table 8** below provides the scientific name, common name, and regulatory status of the special status taxa that comprise the Indian Knob Hotspot. The vegetation communities at this hotspot include annual grassland, oak woodland, chaparral, coastal scrub, and riparian. However, chaparral communities dominate the landscape at Indian Knob. Indian Knob is a prominent mountain peak in the southeastern portion of the San Luis Range and it occurs south of the City of San Luis Obispo. It's located on the east side of Interstate Highway 101 and this hotspot is named after this feature. The total hotspot area is approximately 162 hectares (401 acres or 0.6 square mile) in size. **Figure 13** is a map of the Indian Knob Plant Biodiversity Hotspot at a higher resolution.

Table 8. Indian Knob – Plant Biodiversity Hotspot. Summary of special status taxa that comprise the hotspot. The scientific and common names; federal, state, and CRPR status; and if the taxon is endemic is included. Please refer to Appendix B for specific status code information and abbreviations.

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Agrostis hooveri</i> Hoover's bent grass	NA	NA	1B.2	N
<i>Arctostaphylos pilosula</i> Santa Margarita manzanita	NA	NA	1B.2	N
<i>Calochortus obispoensis</i> San Luis mariposa lily	NA	NA	1B.2	Y

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Castilleja densiflora</i> ssp. <i>obispoensis</i> San Luis Obispo owl's clover	NA	NA	1B.2	Y
<i>Clarkia speciosa</i> ssp. <i>immaculate</i> Pismo clarkia	FE	CR	1B.1	Y
<i>Eriodictyon altissimum</i> Indian Knob mountainbalm	FE	CE	1B.1	Y
<i>Leptodactylon californicum</i> ssp. <i>tomentosum</i> fuzzy prickly-phlox	NA	NA	4.2	N
<i>Lupinus ludovicianus</i> San Luis Obispo County lupine	NA	NA	1B.2	Y
<i>Scrophularia atrata</i> black-flowered figwort	NA	NA	1B.2	N

Figure 13. Indian Knob Plant Biodiversity Hotspot.

Carpenter Canyon Hotspot

The final hotspot detected in the study is Carpenter Canyon. Six special status taxa occur within it and it is also the smallest sized hotspot identified. **Table 9** below provides the scientific name, common name, and regulatory status of the special status taxa that comprise the Carpenter Canyon Hotspot. The vegetation communities present at the Carpenter Canyon hotspot are oak woodland, chaparral, and coastal scrub.

Carpenter Canyon is not only the name of the major canyon in this region, but it is also the name of the portion of State Highway 227 south of the intersection of Edna Road and Price Canyon Road. This hotspot is named for the road and after the canyon associated with this area. The Carpenter Canyon hotspot is located in the southwestern portion of the County. This hotspot occurs along the west side of Carpenter Canyon Road and it is approximately five hectares (12 acres or 0.02 square mile) in size. **Figure 14** is a map of the Carpenter Canyon Plant Biodiversity Hotspot at a higher resolution.

Table 9. Carpenter Canyon – Plant Biodiversity Hotspot. Summary of special status taxa that comprise the hotspot. The scientific and common names; federal, state, and CRPR status; and if the taxon is endemic is included. Please refer to Appendix B for specific status code information and abbreviations.

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Agrostis hooveri</i> Hoover's bent grass	NA	NA	1B.2	N
<i>Arctostaphylos pilosula</i> Santa Margarita manzanita	NA	NA	1B.2	N
<i>Calochortus obispoensis</i> San Luis mariposa lily	NA	NA	1B.2	Y

Scientific Name/Common Name	Federal Status	State Status	CRPR Status	Endemic
<i>Clarkia speciosa</i> ssp. <i>immaculate</i> Pismo clarkia	FE	CR	1B.1	Y
<i>Lupinus</i> <i>ludovicianus</i> San Luis Obispo County lupine	NA	NA	1B.2	Y
<i>Mucronea</i> <i>californica</i> California spineflower	NA	NA	4.2	N

Figure 14. Carpenter Canyon Plant Biodiversity Hotspot.

DISCUSSION

Our analysis was successful at identifying plant biodiversity hotspots in SLO Co. Seven hotspot areas were detected with the GIS model that we designed. The hotspot areas we identified have high levels of species richness, rarity, and endemism at a county scale. While the use of GIS technology is advancement because it greatly increases our capacity to identify, quantify, and store information about biodiversity, it is also a deviation from the original biodiversity hotspot methodologies (Myers et al. 2000). However, the fundamental application of this conceptual framework produced substantive results at the county scale for use to develop localized resource conservation strategies.

As mentioned, the most frequently used indicators for identifying biodiversity hotspots are species richness, endemism, and degree of threat (Zachos and Habel 2011; Dunstan et al. 2012; Gould 2000). This study strayed slightly from these traditional indicators. Our study used distribution data for the rare flora of SLO Co. as a proxy for plant species richness as opposed to complete or exhaustive data for all plant species known to occur within the County. Time, labor intensity, and budgetary constraints were certainly factors that influenced this decision; but more importantly, the prevalence of non-native species can skew the results of plant biodiversity hotspot models. Hotspots models based too heavily on species richness can actually have low levels of species rarity and endemism because the composition can be largely comprised of non-native and invasive species. Orme et al. (2005) found that global avian biodiversity hotspots based on species richness were not congruent with endemism or threat. Newer hotspot analyses

are beginning to emphasize biodiversity models that select conservation areas for both patterns of diversity and the evolutionary processes required to sustain them. Such criteria as evolutionarily significant units (ESU) and other genetic diversity indicators are being afforded much greater emphasis in recent hotspot analyses (Morwitz 2002; Cowling et al. 2003; Vandergast et al. 2008; Hughes et al. 2008).

Our model is based on 1) species richness, 2) rarity, and 3) endemism. Unlike traditional biodiversity models, degree of threat is not addressed. We are aware of the global mass extinction event that is currently underway, the exponential growth in population that humans are experiencing, and various scenarios regarding species homogenization and global climate change (Malcolm et al. 2006; Loarie et al. 2008; Midgley et al. 2002; Schwartz et al. 2006; Keinan and Clark 2012; and Poh et al. 2004). Therefore our model assumes a constant, inherent, and uniform degree of threat throughout the County. We did not have (what we considered) an appropriate framework to accurately assess degree of threat without additional input from other regional planning and resource entities. Integration of degree of threat into our model is a component that would require further studies.

We are interested in conservation at the county scale for several reasons. Foremost, the county is the scale that a significant proportion of conservation activities actually occur; such as land acquisition for reserve establishment, mitigation banking, land use designation and zoning, General Plan development and amendments, and conservation easements. Most land management decisions occur at smaller spatial scales

than the scales of most existing biodiversity models (Dunk et al. 2006). Likewise, regional conservation planning decisions, like the actual locations of new biodiversity reserves, tend to occur at finer spatial scales (Ferrier 2002 and Ferrier et al. 2004). County jurisdictions are typically one of the most influential and authoritative entities responsible for determinations associated with which lands are developed and which are preserved. With the onslaught of budgetary crises in the U.S. and particularly within California, the frequency and scope of discretionary permits issued by county jurisdictions is increasing. For example, the number of multi-family housing construction permits issued from Los Angeles County increased 116% in less than a year (LAEDC 2012). In the central Puget Sound region the number of building permits issued increased 34% from 2009 to 2010 (PST 2012). Federally mandated initiatives associated with economic stimulus programs have increased the number of large-scale construction undertakings occurring at county scales. These types of projects are typically related to renewable energy, like wind and solar development; infrastructure replacement projects, like bridges and highways; and utility upgrades for power from electricity and natural gas. At present at least 16 solar energy project are undergoing review in California counties (CEC 2012). Given these dynamics, we intend to engage the County with our results so that biodiversity conservation will receive consideration during its land use planning permit review processes.

Though the body of literature associated with biodiversity hotspots has had a significant influence on development of conservation strategies globally, at national scales, and within the scientific community; primarily by shifting the focus from single

species conservation approaches to ecosystems conservation, these ideas are still largely under utilized by local and regional governments (Probst and Crow 1991; Burton et al. 1992; and Franklin 1993). Few studies have attempted to quantify the amount of consideration biodiversity conservation receives at county scales. Miller et al. (2008) evaluated staff from planning departments at three metropolitan regions in the U.S. and determined that five percent or less of staff time was given to activities related to biodiversity conservation and 14-20% of the respondents admittedly spent no time at all considering biodiversity-related conservation endeavors. Certainly, biodiversity conservation is pertinent to these jurisdictions and land use planning tools designed to achieve these goals exist. These tools and layers of analysis can be integrated into the planning processes and procedures used at the county and at other regional scales.

We intend to continue to refine this analysis and to use our results to identify under collected regions within the County because we recognize the inherent bias associated with models derived from herbaria collections. Potential sources of such bias include roadside affinity, collector tendencies, and access restrictions (Kadmon et al. 2004). Roadside bias is a result of the locations of existing roads. It tends to influence where botanists collect because they can easily access areas that are within close proximity to or adjacent to roads. Collector bias results from the fact that certain collectors just like particular areas or groups of plants. Botanists tend to return to the same collection sites year after year and this can influence the overall distribution of herbaria collections. Another form of bias is the result of restricted access. Botanists are not always permitted to collect in certain areas like private properties or military lands.

For these reasons, bias is something to consider when interpreting the results of analyses derived from herbaria. Having generated this map, we will gain a greater sense of the locations of under-collected or unsurveyed regions in our County. We also aim to promote and participate in future studies that utilize herbarium datasets because we acknowledge and value their role in biodiversity conservation and informatics.

CONCLUSION

Chapter 1 provided the background information and a literature review of the body of work associated with biodiversity hotspot analyses. It presented our study site, San Luis Obispo County, which is novel because most hotspot analyses are conducted at much larger spatial scales. Our study site occurs within one of the world's currently recognized global biodiversity hotspots, the California Floristic Province. Chapter 2 explains the methods we used; including an explanation of our dataset, how we designed our GIS model, how we digitized our data, and ultimately how we created our final map. Our analysis was successful and seven plant biodiversity hotspots were detected. This study provides support and substantive evidence that biodiversity hotspot techniques are applicable to smaller spatial scales. We would like to create working partnerships with the local and regional entities responsible for land use planning and natural resource management in our area so that our data will be considered in these processes because we think biodiversity conservation is a legitimate and worthy approach. We understand the implications of poor planning decisions, untethered habitat loss, and recognize that extinction is forever. However idealistic, we anticipate the future where science can

inform policy to develop long-term resource conservation planning strategies to conserve biodiversity at all scales.

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APPENDIX A

SCIENTIFIC DATABASE QUERY RESULTS

U.S. Fish and Wildlife Service

Natural Resources of Concern

This resource list is to be used for planning purposes only — it is not an official species-list.

Endangered Species Act species-list information for your project is available online and listed below for the following FWS Field Offices:

VENTURA FISH AND WILDLIFE OFFICE
2493 PORTOLA ROAD, SUITE B
VENTURA, CA 93003
(805) 644-1766

Endangered Species Act species-list information for your project is NOT available online for the following FWS Field Offices:

SACRAMENTO FISH AND WILDLIFE OFFICE
FEDERAL BUILDING
2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
(916) 414-6600

Project Name:

KH Thesis

Project Counties:

San Luis Obispo, CA

Project Type:

Vegetation Management

Natural Resources of Concern

Endangered Species Act Species-list

There are a total of 37 species in your species-list

Species that may be affected by your project: [\(View all critical habitat on one map\)](#)

Amphibians				
Arroyo toad (<i>Bufo californicus</i>)	Endangered	species info		Ventura Fish And Wildlife Office
California Tiger Salamander (<i>Ambystoma californiense</i>) Population: U.S.A. (CA - Santa Barbara County)	Endangered	species info		Ventura Fish And Wildlife Office
California Tiger Salamander (<i>Ambystoma californiense</i>) Population: U.S.A. (Central CA DPS)	Threatened	species info	Final designated critical habitat	Ventura Fish And Wildlife Office
California red-legged frog (<i>Rana draytonii</i>) Population: Entire	Threatened	species info	Final designated critical habitat	Ventura Fish And Wildlife Office
Birds				
California Clapper rail (<i>Rallus longirostris obsoletus</i>)	Endangered	species info		Ventura Fish And Wildlife Office
California Least tern (<i>Sterna antillarum browni</i>)	Endangered	species info		Ventura Fish And Wildlife Office

Natural Resources of Concern

California condor (<i>Gymnogyps californianus</i>) Population: U.S.A. only	Endangered	species info	Final designated critical habitat	Ventura Fish And Wildlife Office
Least Bell's vireo (<i>Vireo bellii pusillus</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Marbled murrelet (<i>Brachyramphus marmoratus</i>) Population: CA, OR, WA	Threatened	species info		Ventura Fish And Wildlife Office
Southwestern Willow flycatcher (<i>Empidonax traillii extimus</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Western Snowy plover (<i>Charadrius alexandrinus nivosus</i>) Population: Pacific coastal pop.	Threatened	species info	Final designated critical habitat	Ventura Fish And Wildlife Office
Crustaceans				
Vernal Pool fairy shrimp (<i>Branchinecta lynchi</i>)	Threatened	species info	Final designated critical habitat	Ventura Fish And Wildlife Office
Flowering Plants				
California jewelflower (<i>Caulanthus californicus</i>)	Endangered	species info		Ventura Fish And Wildlife Office
California seablite (<i>Suaeda californica</i>)	Endangered	species info		Ventura Fish And Wildlife Office

Natural Resources of Concern

Chorro Creek Bog thistle (<i>Cirsium fontinale</i> var. <i>obispoense</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Gambel's watercress (<i>Rorippa gambellii</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Gaviota Tarplant (<i>Deinandra increscens</i> ssp. <i>villosa</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Indian Knob mountain balm (<i>Eriodictyon altissimum</i>)	Endangered	species info		Ventura Fish And Wildlife Office
La Graciosa thistle (<i>Cirsium loncholepis</i>)	Endangered	species info	Final designated critical habitat	Ventura Fish And Wildlife Office
Marsh Sandwort (<i>Arenaria paludicola</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Monterey spineflower (<i>Chorizanthe pungens</i> var. <i>pungens</i>)	Threatened	species info		Ventura Fish And Wildlife Office
Morro manzanita (<i>Arctostaphylos morroensis</i>)	Threatened	species info		Ventura Fish And Wildlife Office

Natural Resources of Concern

Nipomo Mesa lupine (<i>Lupinus nipomensis</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Pismo clarkia (<i>Clarkia speciosa ssp. immaculata</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Purple amole (<i>Chlorogalum purpureum</i>)	Threatened	species info	Final designated critical habitat	Ventura Fish And Wildlife Office
Salt Marsh bird's-beak (<i>Cordylanthus maritimus ssp. maritimus</i>)	Endangered	species info		Ventura Fish And Wildlife Office
San Joaquin wooly-threads (<i>Monolopia congdonii</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Spreading navarretia (<i>Navarretia fossalis</i>)	Threatened	species info		Ventura Fish And Wildlife Office
Insects				
El Segundo Blue butterfly (<i>Euphilotes battoides allyni</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Kern Primrose Sphinx moth (<i>Euproserpinus euterpe</i>)	Threatened	species info		Ventura Fish And Wildlife Office

Natural Resources of Concern

Smith's Blue butterfly (<i>Euphilotes enoptes smithi</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Mammals				
Giant kangaroo rat (<i>Dipodomys ingens</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Morro Bay kangaroo rat (<i>Dipodomys heermanni morroensis</i>)	Endangered	species info	Final designated critical habitat	Ventura Fish And Wildlife Office
San Joaquin Kit fox (<i>Vulpes macrotis mutica</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Southern Sea otter (<i>Enhydra lutris nereis</i>) Population: except where EXPN	Threatened	species info		Ventura Fish And Wildlife Office
Reptiles				
Blunt-Nosed Leopard lizard (<i>Gambelia silus</i>)	Endangered	species info		Ventura Fish And Wildlife Office
Snails				
Morro Shoulderband snail (<i>Helminthoglypta walkeriana</i>)	Endangered	species info	Final designated critical habitat	Ventura Fish And Wildlife Office

U.S. Fish and Wildlife Service

Natural Resources of Concern

FWS National Wildlife Refuges

There are 2 refuges in your refuge list

Bitter Creek National Wildlife Refuge (805) 644-5185 C/O HOPPER MOUNTAIN NWR COMPLEX P.O. BOX 5839 VENTURA, CA93005	refuge profile
Guadalupe-nipomo Dunes National Wildlife Refuge (805) 343-9151 P.O. BOX 9 GUADALUPE, CA93434	refuge profile

FWS Migratory Birds

Not yet available through IPaC.

FWS Delineated Wetlands

Not yet available through IPaC.

California Department of Fish and Game
Natural Diversity Database
Selected Elements by Scientific Name - Portrait

Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1 Abies bracteata bristlecone fir	PGPIN01030			G2	S2.3	1B.3
2 Agrostis hooveri Hoover's bent grass	PMPOA040M0			G2	S2.2	1B.2
3 Allium hickmanii Hickman's onion	PMLIL02140			G2	S2.2	1B.2
4 Antirrhinum ovatum oval-leaved snapdragon	PDSCR2K010			G3	S3.2	4.2
5 Arctostaphylos cruzensis Arroyo de la Cruz manzanita	PDERI040B0			G2	S2.2	1B.2
6 Arctostaphylos hookeri ssp. hearstiorum Hearst's manzanita	PDERI040J4		Endangered	G3T2	S2	1B.2
7 Arctostaphylos luciana Santa Lucia manzanita	PDERI040N0			G2	S2.2	1B.2
8 Arctostaphylos montereyensis Toro manzanita	PDERI040R0			G2	S2.1	1B.2
9 Arctostaphylos morroensis Morro manzanita	PDERI040S0	Threatened		G2	S2	1B.1
10 Arctostaphylos osoensis Oso manzanita	PDERI042S0			G1	S1.2	1B.2
11 Arctostaphylos pechoensis Pecho manzanita	PDERI04140			G2	S2.2	1B.2
12 Arctostaphylos pilosula Santa Margarita manzanita	PDERI04160			G3	S3	1B.2
13 Arctostaphylos rudis sand mesa manzanita	PDERI041E0			G2	S2.2	1B.2
14 Arctostaphylos tomentosa ssp. daciticola dacite manzanita	PDERI041HD			G4T1	S1.1	1B.1
15 Arenaria paludicola marsh sandwort	PDCAR040L0	Endangered	Endangered	G1	S1	1B.1
16 Aristocapsa insignis Indian Valley spineflower	PDPGN0U010			G2	S2.2	1B.2
17 Astragalus didymocarpus var. milesianus Miles' milk-vetch	PDFAB0F2X3			G5T2	S2.2	1B.2
18 Atriplex cordulata heartscale	PDCHE040B0			G2?	S2.2?	1B.2
19 Atriplex coronata var. vallicola Lost Hills crownscale	PDCHE04250			G4T2	S2	1B.2
20 Atriplex coulteri Coulter's saltbush	PDCHE040E0			G2	S2.2	1B.2
21 Atriplex joaquiniana San Joaquin spearscale	PDCHE041F3			G2	S2	1B.2
22 Atriplex serenana var. davidsonii Davidson's saltscale	PDCHE041T1			G5T2?	S2?	1B.2
23 Baccharis plummerae ssp. glabrata San Simeon baccharis	PDAST0W0D1			G3T1	S1.2	1B.2

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Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24 Bloomeria humilis dwarf goldenstar	PMLIL0B020		Rare	G1	S1.1	1B.2
25 California macrophylla round-leaved filaree	PDGER01070			G2	S2	1B.1
26 Calochortus clavatus var. recurvifolius Arroyo de la Cruz mariposa-lily	PMLIL0D098			G4T1	S1.2	1B.2
27 Calochortus fimbriatus late-flowered mariposa-lily	PMLIL0D1J2			G3G4	S2.2	1B.2
28 Calochortus obispoensis La Panza mariposa-lily	PMLIL0D110			G2	S2.1	1B.2
29 Calochortus palmeri var. palmeri Palmer's mariposa-lily	PMLIL0D122			G2T2	S2.1	1B.2
30 Calochortus simulans San Luis Obispo mariposa-lily	PMLIL0D170			G2	S2.3	1B.3
31 Calycadenia villosa dwarf calycadenia	PDAST1P0B0			G2	S2.1	1B.1
32 Calyptidium parryi var. hesseae Santa Cruz Mountains pussypaws	PDPOR09052			G3G4T2	S2	1B.1
33 Calystegia subacaulis ssp. episcopalis Cambria morning-glory	PDCON040J1			G3T3	S3	4.2
34 Camissonia hardhamiae Hardham's evening-primrose	PDONA030N0			G1Q	S1	1B.2
35 Carex obispoensis San Luis Obispo sedge	PMCYP039J0			G2	S2.2	1B.2
36 Castilleja ambigua ssp. insalutata pink johnny-nip	PDSCR0D403			G4T1	S1	1B.1
37 Castilleja densiflora ssp. obispoensis San Luis Obispo owl's-clover	PDSCR0D453			G5T2	S2.2	1B.2
38 Caulanthus californicus California jewel-flower	PDBRA31010	Endangered	Endangered	G1	S1	1B.1
39 Caulanthus lemmonii Lemmon's jewel-flower	PDBRA0M0E0			G2	S2.2	1B.2
40 Ceanothus hearstiorum Hearst's ceanothus	PDRHA040J0		Rare	G1	S1.2	1B.2
41 Ceanothus maritimus maritime ceanothus	PDRHA040T0		Rare	G2	S2.2	1B.2
42 Centromadia parryi ssp. congdonii Congdon's tarplant	PDAST4R0P1			G4T2	S2	1B.2
43 Centromadia parryi ssp. parryi pappose tarplant	PDAST4R0P2			G4T1	S1	1B.2
44 Chenopodium littoreum coastal goosefoot	PDCHE091Z0			G2	S2	1B.2
45 Chlorogalum pomeridianum var. minus dwarf soaproot	PMLIL0G042			G5T2	S2	1B.2
46 Chlorogalum purpureum var. purpureum Santa Lucia purple amole	PMLIL0G051	Threatened		G2T2	S2	1B.1

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47 Chlorogalum purpureum var. reductum Camatta Canyon amole	PMLIL0G052	Threatened	Rare	G2T1	S1	1B.1
48 Chloropyron maritimum ssp. maritimum salt marsh bird's-beak	PDSCR0J0C2	Endangered	Endangered	G4?T1	S1	1B.2
49 Chorizanthe breweri Brewer's spineflower	PDPGN04050			G2	S2.2	1B.3
50 Chorizanthe pungens var. pungens Monterey spineflower	PDPGN040M2	Threatened		G2T2	S2	1B.2
51 Chorizanthe rectispina straight-awned spineflower	PDPGN040N0			G1	S1.2	1B.3
52 Cirsium fontinale var. obispoense Chorro Creek bog thistle	PDAST2E162	Endangered	Endangered	G2T2	S2	1B.2
53 Cirsium occidentale var. compactum compact cobwebby thistle	PDAST2E1Z1			G3G4T2	S2.1	1B.2
54 Cirsium occidentale var. lucianum Cuesta Ridge thistle	PDAST2E1Z6			G3G4T2	S2	1B.2
55 Cirsium rathophilum surf thistle	PDAST2E2J0		Threatened	G1	S1	1B.2
56 Cirsium scariosum var. loncholepis La Graciosa thistle	PDAST2E1N0	Endangered	Threatened	G5T1	S1	1B.1
57 Cladium californicum California saw-grass	PMCYP04010			G4	S2.2	2.2
58 Cladonia firma firm cup lichen	NLT0008460			G4	S1.1	
59 Clarkia speciosa ssp. immaculata Pismo clarkia	PDONA05111	Endangered	Rare	G4T1	S1	1B.1
60 Deinandra halliana Hall's tarplant	PDAST4R0C0			G2	S2	1B.1
61 Deinandra increscens ssp. foliosa leafy tarplant	PDAST4R0U4			G4G5T2	S2.2	1B.2
62 Delphinium parryi ssp. blochmaniae dune larkspur	PDRAN0B1B1			G4T2	S2.2	1B.2
63 Delphinium parryi ssp. eastwoodiae Eastwood's larkspur	PDRAN0B1B2			G4T2	S2	1B.2
64 Delphinium recurvatum recurved larkspur	PDRAN0B1J0			G3	S3	1B.2
65 Delphinium umbraculorum umbrella larkspur	PDRAN0B1W0			G2G3	S2S3.3	1B.3
66 Dithyrea maritima beach spectaclepod	PDBRA10020		Threatened	G2	S2.1	1B.1
67 Dudleya abramsii ssp. bettinae Betty's dudleya	PDCRA04011			G3T1	S1.2	1B.2
68 Dudleya abramsii ssp. murina mouse-gray dudleya	PDCRA04012			G3T2	S2.3	1B.3
69 Dudleya blochmaniae ssp. blochmaniae Blochman's dudleya	PDCRA04051			G2T2	S2.1	1B.1

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70 Entosthodon kochii Koch's cord moss	NBMUS2P050			G1	S1	1B.3
71 Eriastrum hooveri Hoover's eriastrum	PDPLM03070	Delisted		G3	S3.2	4.2
72 Eriastrum luteum yellow-flowered eriastrum	PDPLM03080			G2	S2.2	1B.2
73 Erigeron blochmaniae Blochman's leafy daisy	PDAST3M5J0			G2	S2.2	1B.2
74 Eriodictyon altissimum Indian Knob mountainbalm	PDHYD04010	Endangered	Endangered	G1	S1	1B.1
75 Eriogonum temblorense Temblor buckwheat	PDPGN085P0			G2	S2.2	1B.2
76 Eryngium aristulatum var. hooveri Hoover's button-celery	PDAP10Z043			G5T2	S2.1	1B.1
77 Eryngium spinosepalum spiny-sepaled button-celery	PDAP10Z0Y0			G2	S2.2	1B.2
78 Eschscholzia rhombipetala diamond-petaled California poppy	PDPAP0A0D0			G1	S1.1	1B.1
79 Fritillaria agrestis stinkbells	PMLIL0V010			G3	S3.2	4.2
80 Fritillaria ojaiensis Ojai fritillary	PMLIL0V0N0			G2	S2	1B.2
81 Fritillaria viridea San Benito fritillary	PMLIL0V0L0			G2	S2	1B.2
82 Galium californicum ssp. luciense Cone Peak bedstraw	PDRUB0N0E3			G5T2	S2.3	1B.3
83 Galium hardhamiae Hardham's bedstraw	PDRUB0N0Y0			G2	S2.3	1B.3
84 Horkelia cuneata ssp. puberula mesa horkelia	PDROS0W045			G4T2	S2.1	1B.1
85 Horkelia cuneata ssp. sericea Kellogg's horkelia	PDROS0W043			G4T1	S1.1	1B.1
86 Juncus luciensis Santa Lucia dwarf rush	PMJUN013J0			G2G3	S2S3	1B.2
87 Lasthenia californica ssp. macrantha perennial goldfields	PDAST5L0C5			G3T2	S2.2	1B.2
88 Lasthenia glabrata ssp. coulteri Coulter's goldfields	PDAST5L0A1			G4T3	S2.1	1B.1
89 Layia heterotricha pale-yellow layia	PDAST5N070			G2	S2	1B.1
90 Layia jonesii Jones' layia	PDAST5N090			G1	S1.1	1B.2
91 Layia munzii Munz's tidy-tips	PDAST5N0B0			G1	S1.1	1B.2
92 Lepidium jaredii ssp. album Panoche pepper-grass	PDBRA1M0G2			G1T1	S1.2	1B.2

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93 <i>Lepidium jaredii</i> ssp. <i>jaredii</i> Jared's pepper-grass	PDBRA1M0G1			G1T1	S1.2	1B.2
94 <i>Lupinus ludovicianus</i> San Luis Obispo County lupine	PDFAB2B2G0			G2	S2.2	1B.2
95 <i>Lupinus nipomensis</i> Nipomo Mesa lupine	PDFAB2B550	Endangered	Endangered	G1	S1	1B.1
96 <i>Madia radiata</i> showy golden madia	PDAST650E0			G2	S2.1	1B.1
97 <i>Malacothamnus davidsonii</i> Davidson's bush-mallow	PDMAL0Q040			G1	S1.1	1B.2
98 <i>Malacothamnus palmeri</i> var. <i>involucratus</i> Carmel Valley bush-mallow	PDMAL0Q0B1			G3T2Q	S2.2	1B.2
99 <i>Malacothamnus palmeri</i> var. <i>palmeri</i> Santa Lucia bush-mallow	PDMAL0Q0B5			G3T2Q	S2.2	1B.2
100 <i>Malacothrix saxatilis</i> var. <i>arachnoidea</i> Carmel Valley malacothrix	PDAST660C2			G5T2	S2.2	1B.2
101 <i>Microseris paludosa</i> marsh microseris	PDAST6E0D0			G2	S2.2	1B.2
102 <i>Monardella crispa</i> crisp monardella	PDLAM18070			G2	S2.2	1B.2
103 <i>Monardella frutescens</i> San Luis Obispo monardella	PDLAM180X0			G2	S2.2	1B.2
104 <i>Monardella palmeri</i> Palmer's monardella	PDLAM180H0			G2	S2.2	1B.2
105 <i>Monolopia congdonii</i> San Joaquin woollythreads	PDASTA8010	Endangered		G3	S3	1B.2
106 <i>Monolopia gracilens</i> woodland woollythreads	PDAST6G010			G2G3	S2S3	1B.2
107 <i>Nasturtium gambelii</i> Gambel's water cress	PDBRA270V0	Endangered	Threatened	G1	S1	1B.1
108 <i>Navarretia fossalis</i> spreading navarretia	PDPLM0C080	Threatened		G1	S1	1B.1
109 <i>Navarretia nigelliformis</i> ssp. <i>radians</i> shining navarretia	PDPLM0C0J2			G4T2	S2	1B.2
110 <i>Navarretia prostrata</i> prostrate vernal pool navarretia	PDPLM0C0Q0			G2	S2	1B.1
111 <i>Nemacladus secundiflorus</i> var. <i>robbinsii</i> Robbins' nemacladus	PDCAM0F0B2			G3T2T3	S2S3	1B.2
112 <i>Orobanche parishii</i> ssp. <i>brachyloba</i> short-lobed broomrape	PDORO040A2			G4?T3	S3.2	4.2
113 <i>Pedicularis dudleyi</i> Dudley's lousewort	PDSCR1K0D0		Rare	G2	S2.2	1B.2
114 <i>Pinus radiata</i> Monterey pine	PGPIN040V0			G1	S1.1	1B.1
115 <i>Plagiobothrys uncinatus</i> hooked popcorn-flower	PDBOR0V170			G2	S2.2	1B.2

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116 Poa diaboli Diablo Canyon blue grass	PMPOA4Z390			G1	S1.2	1B.2
117 Sanicula maritima adobe sanicle	PDAPI1Z0D0		Rare	G2	S2.2	1B.1
118 Scrophularia atrata black-flowered figwort	PDSCR1S010			G2	S2.2	1B.2
119 Senecio aphanactis chaparral ragwort	PDAST8H060			G3?	S1.2	2.2
120 Sidalcea hickmanii ssp. anomala Cuesta Pass checkerbloom	PDMAL110A1		Rare	G3T1	S1	1B.2
121 Sidalcea hickmanii ssp. parishii Parish's checkerbloom	PDMAL110A3		Rare	G3T1	S1.2	1B.2
122 Streptanthus albidus ssp. peramoenus most beautiful jewel-flower	PDBRA2G012			G2T2	S2.2	1B.2
123 Stylocline masonii Mason's neststraw	PDAST8Y080			G1	S1.1	1B.1
124 Suaeda californica California seablite	PDCHE0P020	Endangered		G1	S1	1B.1
125 Sulcaria isidiifera splitting yarn lichen	NLTEST0020			G1	S1.1	
126 Symphyotrichum defoliatum San Bernardino aster	PDASTE80C0			G2	S2	1B.2
127 Trifolium hydrophilum saline clover	PDFAB400R5			G2	S2	1B.2
128 Tritoleia ixioides ssp. cookii Cook's triteleia	PMLIL210A2			G5T2	S2.3	1B.3
129 Tropidocarpum capparideum caper-fruited tropidocarpum	PDBRA2R010			G1	S1.1	1B.1

Plant List

214 matches found. *Click on scientific name for details*

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Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Abies bracteata	bristlecone fir	Pinaceae	perennial evergreen tree	1B.3	S2.3	G2
Abronia maritima	red sand-verbena	Nyctaginaceae	perennial herb	4.2	S3?	G4?
Acanthomintha obovata ssp. cordata	heart-leaved thorn-mint	Lamiaceae	annual herb	4.2	S3.2?	G3?T3?
Acanthomintha obovata ssp. obovata	San Benito thorn-mint	Lamiaceae	annual herb	4.2	S3.2?	G3?T3?
Agrostis hooveri	Hoover's bent grass	Poaceae	perennial herb	1B.2	S2.2	G2
Allium hickmanii	Hickman's onion	Alliaceae	perennial bulbiferous herb	1B.2	S2.2	G2
Allium howellii var. clokeyi	Mt. Pinos onion	Alliaceae	perennial bulbiferous herb	1B.3	S2.3	G4T2

<u>Amsinckia douglasiana</u>	Douglas' fiddleneck	Boraginaceae	annual herb	4.2	S3.2	G3
<u>Amsinckia furcata</u>	forked fiddleneck	Boraginaceae	annual herb	4.2	S3.2	G4
<u>Androsace elongata ssp. acuta</u>	California androsace	Primulaceae	annual herb	4.2	S3.2?	G5?T3T4
<u>Antirrhinum ovatum</u>	oval-leaved snapdragon	Plantaginaceae	annual herb	4.2	S3.2	G3
<u>Arctostaphylos crustacea ssp. subcordata</u>	Santa Cruz Island manzanita	Ericaceae	perennial evergreen shrub	4.2	S3.2	G4T3
<u>Arctostaphylos cruzensis</u>	Arroyo de la Cruz manzanita	Ericaceae	perennial evergreen shrub	1B.2	S2.2	G2
<u>Arctostaphylos hookeri ssp. hearstiorum</u>	Hearst's manzanita	Ericaceae	perennial evergreen shrub	1B.2	S2	G3T2
<u>Arctostaphylos hooveri</u>	Hoover's manzanita	Ericaceae	perennial evergreen shrub	4.3	S3.3?	G3
<u>Arctostaphylos luciana</u>	Santa Lucia manzanita	Ericaceae	perennial evergreen shrub	1B.2	S2.2	G2
<u>Arctostaphylos montereyensis</u>	Toro manzanita	Ericaceae	perennial evergreen shrub	1B.2	S2.1	G2
<u>Arctostaphylos morroensis</u>	Morro manzanita	Ericaceae	perennial evergreen shrub	1B.1	S2	G2
<u>Arctostaphylos obispoensis</u>	Bishop manzanita	Ericaceae	perennial evergreen shrub	4.3	S3?	G3?
<u>Arctostaphylos osoensis</u>	Oso manzanita	Ericaceae	perennial evergreen shrub	1B.2	S1.2	G1
<u>Arctostaphylos pechoensis</u>	Pecho manzanita	Ericaceae	perennial evergreen shrub	1B.2	S2.2	G2
<u>Arctostaphylos pilosula</u>	Santa Margarita manzanita	Ericaceae	perennial evergreen shrub	1B.2	S3	G3

<u>Arctostaphylos rudis</u>	sand mesa manzanita	Ericaceae	perennial evergreen shrub	1B.2	S2.2	G2
<u>Arctostaphylos tomentosa ssp. daciticola</u>	dacite manzanita	Ericaceae	perennial evergreen shrub	1B.1	S1.1	G4T1
<u>Arenaria paludicola</u>	marsh sandwort	Caryophyllaceae	perennial stoloniferous herb	1B.1	S1	G1
<u>Aristocapsa insignis</u>	Indian Valley spineflower	Polygonaceae	annual herb	1B.2	S2.2	G2
<u>Aspidotis carlotta-halliae</u>	Carlotta Hall's lace fern	Pteridaceae	perennial rhizomatous herb	4.2	S3.2	G3
<u>Astragalus didymocarpus var. milesianus</u>	Miles' milk-vetch	Fabaceae	annual herb	1B.2	S2.2	G5T2
<u>Astragalus macrodon</u>	Salinas milk-vetch	Fabaceae	perennial herb	4.3	S3.3	G3
<u>Astragalus nuttallii var. nuttallii</u>	ocean bluff milk-vetch	Fabaceae	perennial herb	4.2	S3.2	G3T3
<u>Atriplex cordulata var. cordulata</u>	heartscale	Chenopodiaceae	annual herb	1B.2	S2.2?	G2?
<u>Atriplex coronata var. coronata</u>	crownscale	Chenopodiaceae	annual herb	4.2	S3.2	G4T3
<u>Atriplex coronata var. vallicola</u>	Lost Hills crownscale	Chenopodiaceae	annual herb	1B.2	S2	G4T2
<u>Atriplex coulteri</u>	Coulter's saltbush	Chenopodiaceae	perennial herb	1B.2	S2.2	G2
<u>Atriplex joaquinana</u>	San Joaquin spearscale	Chenopodiaceae	annual herb	1B.2	S2	G2
<u>Atriplex serenana var. davidsonii</u>	Davidson's saltscale	Chenopodiaceae	annual herb	1B.2	S2?	G5T2?
<u>Baccharis plummerae ssp. glabrata</u>	San Simeon baccharis	Asteraceae	perennial deciduous shrub	1B.2	S1.2	G3T1
<u>Baccharis plummerae ssp. plummerae</u>	Plummer's baccharis	Asteraceae	perennial deciduous shrub	4.3	S3.2	G3T3

<u>Bloomeria humilis</u>	dwarf goldenstar	Themidaceae	perennial bulbiferous herb	1B.2	S1.1	G1
<u>Calandrinia breweri</u>	Brewer's calandrinia	Montiaceae	annual herb	4.2	S3.2?	G4
<u>California macrophylla</u>	round-leaved filaree	Geraniaceae	annual herb	1B.1	S2	G2
<u>Calochortus catalinae</u>	Catalina mariposa lily	Liliaceae	perennial bulbiferous herb	4.2	S3.2	G3
<u>Calochortus clavatus var. clavatus</u>	club-haired mariposa lily	Liliaceae	perennial bulbiferous herb	4.3	S3	G4T3
<u>Calochortus clavatus var. recurvifolius</u>	Arroyo de la Cruz mariposa lily	Liliaceae	perennial bulbiferous herb	1B.2	S1.2	G4T1
<u>Calochortus fimbriatus</u>	late-flowered mariposa lily	Liliaceae	perennial bulbiferous herb	1B.2	S2.2	G3G4
<u>Calochortus obispoensis</u>	San Luis mariposa lily	Liliaceae	perennial bulbiferous herb	1B.2	S2.1	G2
<u>Calochortus palmeri var. palmeri</u>	Palmer's mariposa lily	Liliaceae	perennial bulbiferous herb	1B.2	S2.1	G2T2
<u>Calochortus simulans</u>	La Panza mariposa lily	Liliaceae	perennial bulbiferous herb	1B.3	S2.3	G2
<u>Calochortus uniflorus</u>	large-flowered mariposa lily	Liliaceae	perennial bulbiferous herb	4.2	S3	G4
<u>Calycadenia villosa</u>	dwarf calycadenia	Asteraceae	annual herb	1B.1	S2.1	G2
<u>Calyptridium parryi var. hesseae</u>	Santa Cruz Mountains pussypaws	Montiaceae	annual herb	1B.1	S2	G3G4T2
<u>Calystegia subacaulis ssp. episcopalis</u>	Cambria morning-glory	Convolvulaceae	perennial rhizomatous herb	4.2	S3	G3T3
<u>Camissoniopsis hardhamiae</u>	Hardham's evening-primrose	Onagraceae	annual herb	1B.2	S1	G1Q

<u>Carex obispoensis</u>	San Luis Obispo sedge	Cyperaceae	perennial rhizomatous herb	1B.2	S2.2	G2
<u>Castilleja ambigua ssp. ambigua</u>	johnny-nip	Orobanchaceae	annual herb	4.2	S3	G4T3T4
<u>Castilleja ambigua ssp. insalutata</u>		Orobanchaceae	annual herb	1B.1	S1	G4T1
<u>Castilleja densiflora ssp. obispoensis</u>	San Luis Obispo owl's-clover	Orobanchaceae	annual herb	1B.2	S2.2	G5T2
<u>Castilleja plagiotoma</u>	Mojave paintbrush	Orobanchaceae	perennial herb (hemiparasitic)	4.3	S3.3	G3
<u>Caulanthus californicus</u>	California jewel-flower	Brassicaceae	annual herb	1B.1	S1	G1
<u>Caulanthus lemmonii</u>	Lemmon's jewelflower	Brassicaceae	annual herb	1B.2	S2.2	G2
<u>Ceanothus cuneatus var. fascicularis</u>	Lompoc ceanothus	Rhamnaceae	perennial evergreen shrub	4.2	S3.2	G5T3
<u>Ceanothus hearstiorum</u>	Hearst's ceanothus	Rhamnaceae	perennial evergreen shrub	1B.2	S1.2	G1
<u>Ceanothus maritimus</u>	maritime ceanothus	Rhamnaceae	perennial evergreen shrub	1B.2	S2.2	G2
<u>Ceanothus rigidus</u>	Monterey ceanothus	Rhamnaceae	perennial evergreen shrub	4.2	S3.2	G5T3
<u>Centromadia parryi ssp. congdonii</u>	Congdon's tarplant	Asteraceae	annual herb	1B.2	S2	G4T2
<u>Centromadia parryi ssp. parryi</u>	pappose tarplant	Asteraceae	annual herb	1B.2	S1	G4T1
<u>Chenopodium littoreum</u>	coastal goosefoot	Chenopodiaceae	annual herb	1B.2	S2	G2
<u>Chlorogalum pomeridianum var. minus</u>	dwarf soaproot	Agavaceae	perennial bulbiferous herb	1B.2	S2	G5T2

<u>Chlorogalum purpureum var. purpureum</u>	Santa Lucia purple amole	Agavaceae	perennial bulbiferous herb	1B.1	S2	G2T2
<u>Chlorogalum purpureum var. reductum</u>	Camatta Canyon amole	Agavaceae	perennial bulbiferous herb	1B.1	S1	G2T1
<u>Chloropyron maritimum ssp. maritimum</u>	salt marsh bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	1B.2	S1	G4?T1
<u>Chorizanthe breweri</u>	Brewer's spineflower	Polygonaceae	annual herb	1B.3	S2.2	G2
<u>Chorizanthe douglasii</u>	Douglas' spineflower	Polygonaceae	annual herb	4.3	S3.3	G3
<u>Chorizanthe palmeri</u>	Palmer's spineflower	Polygonaceae	annual herb	4.2	S3.2?	G3?
<u>Chorizanthe pungens var. pungens</u>	Monterey spineflower	Polygonaceae	annual herb	1B.2	S2	G2T2
<u>Chorizanthe rectispina</u>	straight-awned spineflower	Polygonaceae	annual herb	1B.3	S1.2	G1
<u>Chorizanthe ventricosa</u>	potbellied spineflower	Polygonaceae	annual herb	4.3	S3.3	G3
<u>Cicuta maculata var. bolanderi</u>	Bolander's water-hemlock	Apiaceae	perennial herb	2.1	S2	G5T3T4
<u>Cirsium fontinale var. obispoense</u>	San Luis Obispo fountain thistle	Asteraceae	perennial herb	1B.2	S2	G2T2
<u>Cirsium occidentale var. compactum</u>	compact cobwebby thistle	Asteraceae	perennial herb	1B.2	S2.1	G3G4T2
<u>Cirsium occidentale var. lucianum</u>	Cuesta Ridge thistle	Asteraceae	perennial herb	1B.2	S2	G3G4T2
<u>Cirsium rhotophilum</u>	Surf thistle	Asteraceae	perennial herb	1B.2	S1	G1
<u>Cirsium scariosum var. loncholepis</u>	La Graciosa thistle	Asteraceae	perennial herb	1B.1	S1	G5T1
<u>Cladium californicum</u>	California sawgrass	Cyperaceae	perennial rhizomatous herb	2.2	S2.2	G4

<u>Clarkia speciosa ssp. immaculata</u>	Pismo clarkia	Onagraceae	annual herb	1B.1	S1	G4T1
<u>Clinopodium mimuloides</u>	monkey-flower savory	Lamiaceae	perennial herb	4.2	S3.2	G3
<u>Convolvulus simulans</u>	small-flowered morning-glory	Convolvulaceae	annual herb	4.2	S3.2	G3
<u>Corethrogyne leucophylla</u>	branching beach aster	Asteraceae	perennial herb	3.2	S3.2	G3Q
<u>Deinandra halliana</u>	Hall's tarplant	Asteraceae	annual herb	1B.1	S2	G2
<u>Deinandra increscens ssp. foliosa</u>	leafy tarplant	Asteraceae	annual herb	1B.2	S2.2	G4G5T2
<u>Delphinium gypsophilum ssp. gypsophilum</u>	gypsum-loving larkspur	Ranunculaceae	perennial herb	4.2	S3.2	G4T3
<u>Delphinium gypsophilum ssp. parviflorum</u>	small-flowered gypsum-loving larkspur	Ranunculaceae	perennial herb	4.3	S3.3	G4T3
<u>Delphinium parryi ssp. blochmaniae</u>	dune larkspur	Ranunculaceae	perennial herb	1B.2	S2.2	G4T2
<u>Delphinium parryi ssp. eastwoodiae</u>	Eastwood's larkspur	Ranunculaceae	perennial herb	1B.2	S2	G4T2
<u>Delphinium recurvatum</u>	recurved larkspur	Ranunculaceae	perennial herb	1B.2	S3	G3
<u>Delphinium umbraculorum</u>	umbrella larkspur	Ranunculaceae	perennial herb	1B.3	S2S3.3	G2G3
<u>Dithyrea maritima</u>	beach spectaclepod	Brassicaceae	perennial rhizomatous herb	1B.1	S2.1	G2
<u>Dudleya abramsii ssp. bettinae</u>	Betty's dudleya	Crassulaceae	perennial herb	1B.2	S1.2	G3T1
<u>Dudleya abramsii ssp. murina</u>	mouse-gray dudleya	Crassulaceae	perennial leaf succulent	1B.3	S2.3	G3T2
<u>Dudleya blochmaniae ssp. blochmaniae</u>	Blochman's dudleya	Crassulaceae	perennial herb	1B.1	S2.1	G2T2

<u>Eleocharis parvula</u>	small spikerush	Cyperaceae	perennial herb	4.3	S3.3	G5
<u>Entosthodon kochii</u>	Koch's cord moss	Funariaceae	moss	1B.3	S1	G1
<u>Eremalche kernensis</u>	Kern mallow	Malvaceae	annual herb	1B.1	S1	G3?T1Q
<u>Eriastrum hooveri</u>	Hoover's eriastrum	Polemoniaceae	annual herb	4.2	S3.2	G3
<u>Eriastrum luteum</u>	yellow-flowered eriastrum	Polemoniaceae	annual herb	1B.2	S2.2	G2
<u>Erigeron blochmaniae</u>	Blochman's leafy daisy	Asteraceae	perennial rhizomatous herb	1B.2	S2.2	G2
<u>Erigeron sanctarum</u>	saint's daisy	Asteraceae	perennial rhizomatous herb	4.2	S3.2	G3
<u>Eriodictyon altissimum</u>	Indian Knob mountainbalm	Hydrophyllaceae	perennial evergreen shrub	1B.1	S1	G1
<u>Eriogonum elegans</u>	elegant wild buckwheat	Polygalaceae	annual herb	4.3	S3	G3
<u>Eriogonum gossypinum</u>	cottony buckwheat	Polygonaceae	annual herb	4.2	S3.2	G3
<u>Eriogonum nudum var. indictum</u>	protruding buckwheat	Polygonaceae	perennial herb	4.2	S3.2	G5T3
<u>Eriogonum temblorense</u>	Temblor buckwheat	Polygonaceae	annual herb	1B.2	S2.2	G2
<u>Eryngium aristulatum var. hooveri</u>	Hoover's button-celery	Apiaceae	annual / perennial herb	1B.1	S2.1	G5T2
<u>Eryngium spinosepalum</u>	spiny-sepaled button- celery	Apiaceae	annual / perennial herb	1B.2	S2.2	G2
<u>Erysimum capitatum var. lompocense</u>	San Luis Obispo wallflower	Brassicaceae	perennial herb	4.2	S3.2	G5T3
<u>Erysimum suffrutescens</u>	suffrutescent wallflower	Brassicaceae	perennial herb	4.2	S3.2	G3
<u>Eschscholzia hypocoides</u>	San Benito poppy	Papaveraceae	annual herb	4.3	S3.3	G3
<u>Eschscholzia rhombipetala</u>	diamond-petaled	Papaveraceae	annual herb	1B.1	S1.1	G1

California poppy

<u>Fritillaria agrestis</u>	stinkbells	Liliaceae	perennial bulbiferous herb	4.2	S3.2	G3
<u>Fritillaria ojaiensis</u>	Ojai fritillary	Liliaceae	perennial bulbiferous herb	1B.2	S2	G2
<u>Fritillaria viridea</u>	San Benito fritillary	Liliaceae	perennial bulbiferous herb	1B.2	S2	G2
<u>Galium andrewsii ssp. gatense</u>	phlox-leaf serpentine bedstraw	Rubiaceae	perennial herb	4.2	S3.2	G5T3
<u>Galium californicum ssp. luciense</u>	Cone Peak bedstraw	Rubiaceae	perennial herb	1B.3	S2.3	G5T2
<u>Galium cliftonsmithii</u>	Santa Barbara bedstraw	Rubiaceae	perennial herb	4.3	S3.3	G3
<u>Galium hardhamiae</u>	Hardham's bedstraw	Rubiaceae	perennial herb	1B.3	S2.3	G2
<u>Gilia latiflora ssp. cuyamensis</u>	Cuyama gilia	Polemoniaceae	annual herb	4.3	S3.3	G5?T3
<u>Gilia leptantha ssp. pinetorum</u>	pine gilia	Polemoniaceae	annual herb	4.3	S3.3	G4T3
<u>Gilia tenuiflora ssp. amplifaucalis</u>	trumpet-throated gilia	Polemoniaceae	annual herb	4.3	S3.3	G3G4T3
<u>Grindelia hirsutula var. maritima</u>	San Francisco gumplant	Asteraceae	perennial herb	3.2	S1	G5T1Q
<u>Hesperervax caulescens</u>	hogwallow starfish	Asteraceae	annual herb	4.2	S3.2	G3
<u>Horkelia cuneata var. puberula</u>	mesa horkelia	Rosaceae	perennial herb	1B.1	S2.1	G4T2
<u>Horkelia cuneata var. sericea</u>	Kellogg's horkelia	Rosaceae	perennial herb	1B.1	S1.1	G4T1
<u>Horkelia yadonii</u>	Santa Lucia horkelia	Rosaceae	perennial rhizomatous herb	4.2	S3.2	G3
<u>Juncus acutus ssp. leopoldii</u>	southwestern spiny rush	Juncaceae	perennial rhizomatous herb	4.2	S3.2	G5T5

<u>Juncus luciensis</u>	Santa Lucia dwarf rush	Juncaceae	annual herb	1B.2	S2S3	G2G3
<u>Lasthenia californica ssp. macrantha</u>	perennial goldfields	Asteraceae	perennial herb	1B.2	S2.2	G3T2
<u>Lasthenia ferrisiae</u>	Ferris' goldfields	Asteraceae	annual herb	4.2	S3.2	G3
<u>Lasthenia glabrata ssp. coulteri</u>	Coulter's goldfields	Asteraceae	annual herb	1B.1	S2.1	G4T3
<u>Lasthenia leptalea</u>	Salinas Valley goldfields	Asteraceae	annual herb	4.3	S3.3	G3
<u>Layia heterotricha</u>	pale-yellow layia	Asteraceae	annual herb	1B.1	S2	G2
<u>Layia jonesii</u>	Jones' layia	Asteraceae	annual herb	1B.2	S1.1	G1
<u>Layia munzii</u>	Munz's tidy-tips	Asteraceae	annual herb	1B.2	S1.1	G1
<u>Lepidium jaredii ssp. album</u>	Panoche pepper-grass	Brassicaceae	annual herb	1B.2	S1.2	G1T1
<u>Lepidium jaredii ssp. jaredii</u>	Jared's pepper-grass	Brassicaceae	annual herb	1B.2	S1.2	G1T1
<u>Leptodactylon californicum ssp. tomentosum</u>	fuzzy prickly-phlox	Polemoniaceae	perennial deciduous shrub	4.2	S3.2	G5T3
<u>Leptosiphon grandiflorus</u>	large-flowered leptosiphon	Polemoniaceae	annual herb	4.2	S3.2	G3
<u>Lessingia tenuis</u>	spring lessingia	Asteraceae	annual herb	4.3	S3.3	G3
<u>Lilium humboldtii ssp. ocellatum</u>	ocellated Humboldt lily	Liliaceae	perennial bulbiferous herb	4.2	S3.2	G4T3
<u>Lomatium parvifolium</u>	small-leaved lomatium	Apiaceae	perennial herb	4.2	S3	G3
<u>Lotus formosissimus</u>	harlequin lotus	Fabaceae	perennial rhizomatous herb	4.2	S3.2	G4
<u>Lupinus cervinus</u>	Santa Lucia lupine	Fabaceae	perennial herb	4.3	S3.3	G3
<u>Lupinus ludovicianus</u>	San Luis Obispo County lupine	Fabaceae	perennial herb	1B.2	S2.2	G2
<u>Lupinus nipomensis</u>	Nipomo Mesa lupine	Fabaceae	annual herb	1B.1	S1	G1

<u>Madia radiata</u>	showy golden madia	Asteraceae	annual herb	1B.1	S2.1	G2
<u>Malacothamnus davidsonii</u>	Davidson's bush-mallow	Malvaceae	perennial deciduous shrub	1B.2	S1.1	G1
<u>Malacothamnus gracilis</u>	slender bush-mallow	Malvaceae	perennial deciduous shrub	4.3	S3.3	G3Q
<u>Malacothamnus jonesii</u>	Jones' bush-mallow	Malvaceae	perennial deciduous shrub	4.3	S3.3	G3
<u>Malacothamnus niveus</u>	San Luis Obispo County bush-mallow	Malvaceae	perennial deciduous shrub	4.3	S3.3	G3Q
<u>Malacothamnus palmeri var. involucratus</u>	Carmel Valley bush-mallow	Malvaceae	perennial deciduous shrub	1B.2	S2.2	G3T2Q
<u>Malacothamnus palmeri var. palmeri</u>	Santa Lucia bush-mallow	Malvaceae	perennial deciduous shrub	1B.2	S2.2	G3T2Q
<u>Malacothrix incana</u>	dunedelion	Asteraceae	perennial herb	4.3	S3.3	G3
<u>Malacothrix phaeocarpa</u>	dusky-fruited malacothrix	Asteraceae	annual herb	4.3	S3.3	G3
<u>Malacothrix saxatilis var. arachnoidea</u>	Carmel Valley malacothrix	Asteraceae	perennial rhizomatous herb	1B.2	S2.2	G5T2
<u>Micropus amphibolus</u>	Mt. Diablo cottonweed	Asteraceae	annual herb	3.2	S3.2?	G3
<u>Microseris paludosa</u>	marsh microseris	Asteraceae	perennial herb	1B.2	S2.2	G2
<u>Mimulus subsecundus</u>	one-sided monkeyflower	Phrymaceae	annual herb	4.3	S3.3	G3
<u>Monardella antonina ssp. benitensis</u>	San Benito monardella	Lamiaceae	perennial rhizomatous herb	4.3	S3.3	G4T3
<u>Monardella frutescens</u>	San Luis Obispo monardella	Lamiaceae	perennial rhizomatous herb	1B.2	S2.2	G2
<u>Monardella palmeri</u>	Palmer's monardella	Lamiaceae	perennial rhizomatous herb	1B.2	S2.2	G2

<u>Monardella undulata</u>	curly-leaved monardella	Lamiaceae	annual herb	4.2	S3.2	G3
<u>Monardella undulata ssp. crispa</u>	crisp monardella	Lamiaceae	perennial rhizomatous herb	1B.2	S2.2	G2
<u>Monolopia congdonii</u>	San Joaquin woollythreads	Asteraceae	annual herb	1B.2	S3	G3
<u>Monolopia gracilens</u>	woodland woollythreads	Asteraceae	annual herb	1B.2	S2S3	G2G3
<u>Mucronea californica</u>	California spineflower	Polygonaceae	annual herb	4.2	S3	G3
<u>Nasturtium gambelii</u>	Gambel's water cress	Brassicaceae	perennial rhizomatous herb	1B.1	S1	G1
<u>Navarretia fossalis</u>	spreading navarretia	Polemoniaceae	annual herb	1B.1	S1	G1
<u>Navarretia nigelliformis ssp. radians</u>	shining navarretia	Polemoniaceae	annual herb	1B.2	S2	G4T2
<u>Navarretia prostrata</u>	prostrate vernal pool navarretia	Polemoniaceae	annual herb	1B.1	S2	G2
<u>Nemacladus secundiflorus var. robbinsii</u>	Robbins' nemacladus	Campanulaceae	annual herb	1B.2	S2S3	G3T2T3
<u>Nemacladus secundiflorus var. secundiflorus</u>	large-flowered nemacladus	Campanulaceae	annual herb	4.3	S3?	G3T3?
<u>Orobanche parishii ssp. brachyloba</u>	short-lobed broomrape	Orobanchaceae	perennial herb (parasitic)	4.2	S3.2	G4?T3
<u>Pedicularis dudleyi</u>	Dudley's lousewort	Orobanchaceae	perennial herb	1B.2	S2.2	G2
<u>Pentachaeta fragilis</u>	fragile pentachaeta	Asteraceae	annual herb	4.3	S3.3	G3
<u>Perideridia gairdneri ssp. gairdneri</u>	Gairdner's yampah	Apiaceae	perennial herb	4.2	S3.2	G5T3
<u>Perideridia pringlei</u>	adobe yampah	Apiaceae	perennial herb	4.3	S3.3	G3
<u>Phacelia ramosissima var.</u>	south coast branching	Boraginaceae	perennial herb	3.2	S3.2	G5?T3

<u>australitoralis</u>	phacelia					
<u>Pinus radiata</u>	Monterey pine	Pinaceae	perennial evergreen tree	1B.1	S1.1	G1
<u>Piperia leptopetala</u>	narrow-petaled rein orchid	Orchidaceae	perennial herb	4.3	S3.3	G3
<u>Piperia michaelii</u>	Michael's rein orchid	Orchidaceae	perennial herb	4.2	S3.2	G3
<u>Plagiobothrys chorisianus var. hickmanii</u>	Hickman's popcorn-flower	Boraginaceae	annual herb	4.2	S3.2	G3T3Q
<u>Plagiobothrys uncinatus</u>	hooked popcorn-flower	Boraginaceae	annual herb	1B.2	S2.2	G2
<u>Poa diaboli</u>	Diablo Canyon blue grass	Poaceae	perennial rhizomatous herb	1B.2	S1.2	G1
<u>Prunus fasciculata var. punctata</u>	sand almond	Rosaceae	perennial deciduous shrub	4.3	S3.3	G5T3
<u>Pseudognaphalium leucocephalum</u>	white rabbit-tobacco	Asteraceae	perennial herb	2.2	S2S3.2	G4
<u>Ribes sericeum</u>	Santa Lucia gooseberry	Grossulariaceae	perennial deciduous shrub	4.3	S3.3	G3
<u>Sanicula hoffmannii</u>	Hoffmann's sanicle	Apiaceae	perennial herb	4.3	S3.3	G3
<u>Sanicula maritima</u>	adobe sanicle	Apiaceae	perennial herb	1B.1	S2.2	G2
<u>Scrophularia atrata</u>	black-flowered figwort	Scrophulariaceae	perennial herb	1B.2	S2.2	G2
<u>Senecio aphanactis</u>	chaparral ragwort	Asteraceae	annual herb	2.2	S1.2	G3?
<u>Senecio astephanus</u>	San Gabriel ragwort	Asteraceae	perennial herb	4.3	S3	G3
<u>Senecio blochmaniae</u>	Blochman's ragwort	Asteraceae	perennial herb	4.2	S3.2	G3
<u>Sidalcea hickmanii ssp. anomala</u>	Cuesta Pass checkerbloom	Malvaceae	perennial herb	1B.2	S1	G3T1
<u>Sidalcea hickmanii ssp.</u>	Parish's checkerbloom	Malvaceae	perennial herb	1B.2	S1.2	G3T1

<u>parishii</u>						
<u>Stebbinsoseris decipiens</u>	Santa Cruz microseris	Asteraceae	annual herb	1B.2	S2.2	G2
<u>Streptanthus albidus ssp. peramoenus</u>	most beautiful jewel-flower	Brassicaceae	annual herb	1B.2	S2.2	G2T2
<u>Stylocline masonii</u>	Mason's neststraw	Asteraceae	annual herb	1B.1	S1.1	G1
<u>Suaeda californica</u>	California seablite	Chenopodiaceae	perennial evergreen shrub	1B.1	S1	G1
<u>Suaeda taxifolia</u>	woolly seablite	Chenopodiaceae	perennial evergreen shrub	4.2	S2S3	G3?
<u>Symphyotrichum defoliatum</u>	San Bernardino aster	Asteraceae	perennial rhizomatous herb	1B.2	S2	G2
<u>Systemotheca vortriedei</u>	Vortriede's spineflower	Polygonaceae	annual herb	4.3	S3.3	G3
<u>Toxicoscordion fontanum</u>	marsh zigadenus	Melanthiaceae	perennial bulbiferous herb	4.2	S3.2	G3
<u>Trifolium hydrophilum</u>	saline clover	Fabaceae	annual herb	1B.2	S2	G2
<u>Triteleia ixioides ssp. cookii</u>	Cook's triteleia	Themidaceae	perennial bulbiferous herb	1B.3	S2.3	G5T2
<u>Tropidocarpum capparideum</u>	caper-fruited tropidocarpum	Brassicaceae	annual herb	1B.1	S1.1	G1

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APPENDIX B

SPECIAL STATUS PLANT SPECIES IN SAN LUIS OBISPO COUNTY

Scientific Name/ Common Name/ Family (Jepson Manual-1) (Jepson Manual-2)	Federal/State/ CRPR Status (Jepson Manual-1) (Jepson Manual-2)	County Distribution	Habitat Requirements	Phenology
<i>Abies bracteata</i> bristlecone fir Pinaceae	--/--/1B.3	Monterey and San Luis Obispo.	Occurs in rocky areas within broadleafed upland forest, chaparral, and lower montane coniferous forest.	Evergreen Tree
<i>Abronia maritima</i> red sand-verbena Nyctaginaceae	--/--/4.2	Anacapa Island, Los Angeles, Orange, Santa Barbara, San Clemente Island, Santa Catalina Island, Santa Cruz Island, San Diego, San Luis Obispo, San Miguel Island, San Nicolas Island, and Ventura.	Occurs in coastal dunes.	February-November
<i>Acanthomintha obovata</i> ssp. <i>cordata</i> heart-leaved thorn-mint Lamiaceae	--/--/4.2	Los Angeles, Monterey, Santa Barbara, San Luis Obispo, and Ventura.	Occurs on clay substrates within opening in chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland.	April-July
<i>Acanthomintha obovata</i> ssp. <i>obovata</i> San Benito thorn-mint Lamiaceae	--/--/4.2	Fresno, Monterey, San Benito, and San Luis Obispo.	Occurs on heavy clay, alkaline soils, and serpentinite substrates within chaparral, cismontane woodland, and valley and foothill grassland.	April-July
<i>Agrostis hooveri</i> Hoover's bent grass Poaceae	--/--/1B.2	Santa Barbara and San Luis Obispo.	Usually occurs on sandy soils within closed-cone coniferous forest, chaparral, cismontane woodland, and valley and foothill grassland.	April-July
<i>Allium hickmanii</i> Hickman's onion Liliaceae	--/--/1B.2	Monterey and San Luis Obispo.	Occurs in closed-cone coniferous forest, maritime chaparral, coastal prairie, coastal scrub, and valley and foothill grassland.	March-May

Scientific Name/ Common Name/ Family (Jepson Manual-1) (Jepson Manual-2)	Federal/State/ CRPR Status (Jepson Manual-1) (Jepson Manual-2)	County Distribution	Habitat Requirements	Phenology
<i>Allium howellii</i> var. <i>clokeyi</i> Mt. Pinos onion Liliaceae	--/--/1B.3	Kern, Los Angeles?*, Santa Barbara, San Luis Obispo, and Ventura.	Occurs in Great Basin scrub and pinyon and juniper woodland.	April-June
<i>Amsinckia douglasiana</i> Douglas' fiddleneck Boraginaceae	--/--/4.2	Kern, Monterey, Santa Barbara, San Benito, San Luis Obispo, and Ventura.	Occurs on Monterey shale substrates and dry regions within cismontane woodland and valley and foothill grassland.	March-May
<i>Amsinckia furcata</i> forked fiddleneck Boraginaceae	--/--/4.2	Fresno, Kings, Kern, Merced, San Benito, and San Luis Obispo.	Occurs in cismontane woodland and valley and foothill grassland.	February-May
<i>Androsace elongata</i> ssp. <i>acuta</i> California androsace Primulaceae	--/--/4.2	Alameda, Contra Costa, Colusa, Fresno, Glenn, Kern, Los Angeles, Merced, Riverside, San Bernardino, San Benito, Santa Clara, San Diego, Siskiyou, San Joaquin, San Luis Obispo, San Mateo, Stanislaus, and Tehama.	Occurs in chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, and valley and foothill grassland.	March-June
<i>Antirrhinum ovatum</i> oval-leaved snapdragon Scrophulariaceae	--/--/4.2	Fresno, Kern, Monterey, Santa Barbara, San Benito, San Luis Obispo, and Ventura.	Occurs on clay or gypsum substrates and often in alkaline soils within chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland.	May-November
<i>Arctostaphylos crustacea</i> ssp. <i>subcordata</i> Santa Cruz Island manzanita Ericaceae	--/--/4.2	Los Angeles, Santa Barbara, Santa Cruz Island, San Luis Obispo?, and Santa Rosa Island.	Occurs on rocky substrates within closed-cone coniferous forest and chaparral.	January-April

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<i>Arctostaphylos cruzensis</i> Arroyo de la Cruz manzanita Ericaceae	--/--/1B.2	Monterey and San Luis Obispo.	Occurs on sandy substrates within broadleafed upland forest, coastal bluff scrub, closed-cone coniferous forest, chaparral, coastal scrub, and valley and foothill grassland.	December-March
<i>Arctostaphylos hookeri</i> ssp. <i>hearstiorum</i> Hearst's manzanita Ericaceae	--/CE/1B.2	Endemic to San Luis Obispo.	Occurs on sandy substrates within maritime chaparral, coastal prairie, coastal scrub, and valley and foothill grassland.	February-April
<i>Arctostaphylos hooveri</i> Hoover's manzanita Ericaceae	--/--/4.3	Monterey and San Luis Obispo.	Occurs in broadleafed upland forest, rocky areas within chaparral, cismontane woodland, and lower montane coniferous forest.	February-June
<i>Arctostaphylos luciana</i> Santa Lucia manzanita Ericaceae	--/--/1B.2	Endemic to San Luis Obispo.	Occurs on shale substrates within chaparral and cismontane woodland.	December-March
<i>Arctostaphylos montereyensis</i> Toro manzanita Ericaceae	--/--/1B.2	Monterey and San Luis Obispo.	Occurs on sandy substrates within maritime chaparral, cismontane woodland, and coastal scrub.	February-March
<i>Arctostaphylos morroensis</i> Morro manzanita Ericaceae	FT/--/1B.1	Endemic to San Luis Obispo.	Occurs on Baywood fine sand substrates within maritime chaparral, cismontane woodland, pre-Flandrian coastal dunes, and coastal scrub.	December-March

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<i>Arctostaphylos obispoensis</i> Bishop manzanita Ericaceae	--/--/4.3	Monterey and San Luis Obispo.	Occurs on serpentinite and rocky substrates within closed-cone coniferous forest, chaparral, and cismontane woodland.	February-June
<i>Arctostaphylos osoensis</i> Oso manzanita Ericaceae	--/--/1B.2	Endemic to San Luis Obispo.	Occurs on dacite porphyry buttes within chaparral and cismontane woodland.	February-March
<i>Arctostaphylos pechoensis</i> Pecho manzanita Ericaceae	--/--/1B.2	Santa Barbara and San Luis Obispo.	Occurs on siliceous shale substrates within closed-cone coniferous forest, chaparral, and coastal scrub.	November-March
<i>Arctostaphylos pilosula</i> Santa Margarita manzanita Ericaceae	--/--/1B.2	Monterey and San Luis Obispo.	Sometimes occurs on sandstone substrates within broadleafed upland forest, closed-cone coniferous forest, chaparral, and cismontane woodland.	December-May
<i>Arctostaphylos rudis</i> sand mesa manzanita Ericaceae	--/--/1B.2	Santa Barbara and San Luis Obispo	Occurs on sandy substrates within maritime chaparral and coastal scrub.	November-February
<i>Arctostaphylos tomentosa</i> ssp. <i>daciticola</i> dacite manzanita Ericaceae	--/--/1B.1	Endemic to San Luis Obispo.	Occurs on dacite porphyry buttes within chaparral and cismontane woodland.	March-May
<i>Arenaria paludicola</i> marsh sandwort Caryophyllaceae	FE/CE/1B.1	Los Angeles, San Bernardino*, Santa Cruz*, San Francisco*, and San Luis Obispo.	Occurs on sandy substrates and in openings within freshwater or brackish marshes and swamps.	May-August

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<i>Aristocapsa insignis</i> Indian Valley spineflower Polygonaceae	--/--/1B.2	Monterey and San Luis Obispo.	Occurs on sandy substrates within cismontane woodland.	May-September
<i>Aspidotis carlotta-halliae</i> Carlotta Hall's lace fern Pteridaceae	--/--/4.2	Alameda, Monterey, Marin, San Benito, and San Luis Obispo.	Generally occurs on serpentinite substrates within chaparral and cismontane woodland.	January-December
<i>Astragalus didymocarpus</i> var. <i>milesianus</i> Miles' milk-vetch Fabaceae	--/--/1B.2	Santa Barbara, San Luis Obispo, and Ventura.	Occurs on clay substrates within coastal scrub.	March-June
<i>Astragalus macrodon</i> Salinas milk-vetch Fabaceae	--/--/4.3	Kern, Monterey, San Benito, San Luis Obispo, and Ventura.	Occurs on sandstone, shale, or serpentinite substrates within openings in chaparral, cismontane woodland, and valley and foothill grassland.	April-July
<i>Astragalus nuttallii</i> var. <i>nuttallii</i> ocean bluff milk-vetch Fabaceae	--/--/4.2	Alameda*, Monterey, Marin, Santa Barbara, San Francisco*, San Luis Obispo, and San Mateo.	Coastal bluff scrub and coastal dunes.	January-November

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<i>Atriplex cordulata</i> heartscale Chenopodiaceae <i>Atriplex cordulata</i> var. <i>cordulata</i> heartscale <i>Atriplex cordulata</i> var. <i>erecticaulis</i> earlimart orach	--/--/1B.2 --/--/1B.2 --/--/1B.2	Alameda, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Madera, Merced, San Joaquin*, San Luis Obispo, Solano, Stanislaus*, Tulare, and Yolo*.	Occurs on saline or alkaline substrates within chenopod scrub, meadows and seeps, and sandy regions within valley and foothill grassland.	April-October
<i>Atriplex coronata</i> var. <i>coronata</i> crownscale Chenopodiaceae	--/--/4.2	Alameda, Contra Costa, Fresno, Glenn, Kings, Kern, Merced, Monterey, San Joaquin?, San Luis Obispo, Solano, and Stanislaus.	Occurs on alkaline, often clay substrates within chenopod scrub, valley and foothill grassland, and vernal pools.	March- October
<i>Atriplex vallicola</i> Lost Hills crownscale Chenopodiaceae <i>Atriplex coronata</i> var. <i>vallicola</i> Lost Hills crownscale	--/--/1B.2	Fresno, Kings, Kern, Merced, and San Luis Obispo.	Occurs on alkaline substrates within chenopod scrub, valley and foothill grasslands, and vernal pools.	April-August
<i>Atriplex coulteri</i> Coulter's saltbush Chenopodiaceae	--/--/1B.2	Anacapa Island, Los Angeles, Orange, Santa Barbara, San Bernardino, San Clemente Island, Santa Catalina Island, Santa Cruz Island, San Diego, San Luis Obispo, San Miguel Island, Santa Rosa Island, and Ventura.	Occurs on alkaline or clay substrates within coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland.	March- October

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<i>Atriplex joaquiniana</i> San Joaquin spearscale Chenopodiaceae	--/--/1B.2	Alameda, Contra Costa, Colusa, Fresno, Glenn, Merced, Monterey, Napa, San Benito, Santa Clara*, San Joaquin*, San Luis Obispo?, Solano, Tulare?*, and Yolo.	Occurs on alkaline substrates within chenopod scrub, meadows and seeps, playas, and valley and foothill grassland.	April-October
<i>Atriplex serenana</i> var. <i>davidsonii</i> Davidson's saltscale Chenopodiaceae	--/--/1B.2	Los Angeles?*, Orange, Riverside, Santa Barbara*, Santa Catalina Island, Santa Cruz Island, San Diego, San Luis Obispo, Santa Rosa Island, and Ventura.	Occurs on alkaline substrates within coastal bluff scrub and coastal scrub.	April-October
<i>Baccharis plummerae</i> ssp. <i>glabrata</i> San Simeon baccharis Asteraceae	--/--/1B.2	Monterey and San Luis Obispo.	Occurs within Coastal scrub.	June
<i>Baccharis plummerae</i> ssp. <i>plummerae</i> Plummer's baccharis Asteraceae	--/--/4.3	Anacapa Island, Los Angeles, Santa Barbara, Santa Cruz Island, San Luis Obispo, and Ventura.	Occurs on rocky substrates within broadleafed upland forest, chaparral, cismontane woodland, and coastal scrub.	May-October
<i>Bloomeria humilis</i> dwarf goldenstar Asteraceae	--/CR/1B.2	Endemic to San Luis Obispo.	Occurs within coastal bluff scrub, chaparral, and valley and foothill grassland.	June
<i>Calandrinia breweri</i> Brewer's calandrinia Portulacaceae	--/--/4.2	Contra Costa, Los Angeles, Mendocino, Monterey, Mariposa, Marin, Napa, Orange, Riverside, Santa Barbara, San Bernardino, Santa Clara, Santa Cruz, Santa Cruz Island, San Diego, Shasta, San Luis Obispo, San Mateo, Sonoma, Santa Rosa Island, and Ventura.	Occurs on sandy or loamy substrates in disturbed sites within chaparral and coastal scrub.	March-June

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<i>California macrophylla</i> Round-leaved filaree Geraniaceae	--/--/1B.1	Alameda, Butte*?, Contra Costa, Colusa, Fresno, Glenn, Kings, Kern, Lake, Lassen, Los Angeles, Merced, Monterey, Napa, Riverside, Santa Barbara, San Benito, Santa Clara, Santa Cruz Island*, San Diego, San Joaquin, San Luis Obispo, San Mateo, Solano, Sonoma, Stanislaus, Tehama, Ventura, and Yolo.	Occurs on clay substrates within cismontane woodland and valley and foothill grassland.	March-May
<i>Calochortus catalinae</i> Catalina mariposa lily Liliaceae	--/--/4.2	Los Angeles, Orange, Santa Barbara, San Bernardino, Santa Catalina Island, Santa Cruz Island, San Diego, San Luis Obispo, Santa Rosa Island, and Ventura.	Occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland.	February-June
<i>Calochortus clavatus</i> var. <i>clavatus</i> club-haired mariposa lily Liliaceae	--/--/4.3	Los Angeles, Santa Barbara, San Benito, San Luis Obispo, and Ventura.	Usually occurs on serpentinite, clay, and/or rocky substrates within chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland.	May-June
<i>Calochortus clavatus</i> var. <i>recurvifolius</i> Arroyo de la Cruz mariposa lily Liliaceae	--/--/1B.2	Endemic to San Luis Obispo.	Occurs in coastal bluff scrub, maritime chaparral, coastal prairie, and lower montane coniferous forest.	June-July
<i>Calochortus fimbriatus</i> late-flowered mariposa lily Liliaceae	--/--/1B.2	Kern, Los Angeles, Monterey, Santa Barbara, San Luis Obispo, and Ventura.	Often occurs on serpentinite substrates within chaparral, cismontane woodland and riparian woodland.	June-August
<i>Calochortus obispoensis</i> San Luis mariposa lily Liliaceae	--/--/1B.2	Endemic to San Luis Obispo.	Often occurs on serpentinite substrates within chaparral, coastal scrub, and valley and foothill grassland.	May-July

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<i>Calochortus palmeri</i> var. <i>palmeri</i> Palmer's mariposa-lily Liliaceae	--/--/1B.2	Kern, Los Angeles, Riverside, Santa Barbara, San Bernardino, San Luis Obispo, and Ventura.	Occurs in mesic areas within chaparral, lower montane coniferous forest, and meadows and seeps.	April-July
<i>Calochortus simulans</i> San Luis Obispo mariposa-lily Liliaceae	--/--/1B.3	Santa Barbara and San Luis Obispo.	Occurs on sandy, often granitic, and sometimes serpentinite substrates within chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland.	April-June
<i>Calochortus uniflorus</i> large-flowered mariposa lily Liliaceae	--/--/4.2	Contra Costa, Colusa, Lake, Mendocino, Monterey, Marin, Napa, Santa Cruz, San Luis Obispo, San Mateo, Sonoma, Tehama, and Trinity.	Occurs in coastal prairie, coastal scrub, meadows and seeps, and north coast coniferous forest.	April-June
<i>Calycadenia villosa</i> dwarf calycadenia Asteraceae	--/--/1B.1	Fresno, Monterey, Santa Barbara, and San Luis Obispo.	Occurs on rocky substrates and fine soils within chaparral, cismontane woodland, meadows and seeps, and valley and foothill grassland.	May-October
<i>Calyptridium parryi</i> var. <i>hesseae</i> Santa Cruz Mountains pussypaws Portulacaceae	--/--/1B.1	Monterey, Santa Clara, Santa Cruz, San Luis Obispo, and Stanislaus.	Occurs on sandy or gravelly substrates and openings within chaparral and cismontane woodland.	May-August
<i>Calystegia subacaulis</i> ssp. <i>episcopalis</i> Cambria morning-glory Convolvulaceae	--/--/4.2	Santa Barbara and San Luis Obispo.	Usually occurs on clay substrates within chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland.	March-July

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<i>Camissonia hardhamiae</i> Hardham's evening- primrose Onagraceae <i>Camissoniopsis hardhamiae</i> Hardham's evening- primrose	--/--/1B.2 --/--/1B.2	Monterey and San Luis Obispo.	Occurs on sandy, decomposed carbonate substrates and disturbed or burned areas within chaparral and cismontane woodland.	March-May
<i>Carex obispoensis</i> San Luis Obispo sedge Cyperaceae	--/--/1B.2	Monterey, San Diego, and San Luis Obispo.	Often occurs in serpentinite seeps, sometimes gabbro substrates, and often clay soils within closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland.	April-June
<i>Castilleja ambigua</i> ssp. <i>ambigua</i> Johnny-nip Scrophulariaceae	--/--/4.2	Alameda, Contra Costa, Del Norte, Humboldt, Mendocino, Marin, Napa, Santa Cruz, San Francisco?, San Luis Obispo, San Mateo, and Sonoma.	Occurs within coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, and vernal pool margins.	March-August
<i>Castilleja ambigua</i> ssp. <i>insalutata</i> pink Johnny-nip Scrophulariaceae	--/--/1B.1	Monterey and San Luis Obispo.	Occurs within coastal prairie and coastal scrub.	May-August
<i>Castilleja densiflora</i> ssp. <i>obispoensis</i> San Luis Obispo owl's- clover Scrophulariaceae	--/--/1B.2	Endemic to San Luis Obispo.	Occurs on serpentinite substrates sometimes, within meadows and seeps and valley and foothill grassland.	March-May

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<i>Castilleja plagiotoma</i> Mojave paintbrush Scrophulariaceae	--/--/4.3	Kern, Los Angeles, San Bernardino, and San Luis Obispo.	Occurs on alluvial substrates within Great Basin scrub, Joshua tree woodland, lower montane coniferous forest, and pinyon and juniper woodland.	April-June
<i>Caulanthus californicus</i> California jewel-flower Brassicaceae	FE/CE/1B.1	Fresno, Kings*, Kern, Santa Barbara, San Luis Obispo, and Tulare*.	Occurs on sandy substrates within chenopod scrub, pinyon and juniper woodland, and valley and foothill grassland.	February-May
<i>Caulanthus lemmonii</i> Lemmon's jewel-flower Brassicaceae	--/--/1B.2	Alameda*, Fresno, Kings, Kern, Merced, Monterey, Santa Barbara, San Benito, San Joaquin, San Luis Obispo, Stanislaus, and Ventura.	Occurs in pinyon and juniper woodland and valley and foothill grassland.	March-May
<i>Ceanothus cuneatus</i> var. <i>fascicularis</i> Lompoc ceanothus Rhamnaceae	--/--/4.2	Santa Barbara and San Luis Obispo.	Occurs on sandy substrates within chaparral.	February-April
<i>Ceanothus rigidus</i> California-lilac	--/--/4.2			
<i>Ceanothus hearstiorum</i> Hearst's ceanothus Rhamnaceae	--/CR/1B.2	Endemic to San Luis Obispo.	Occurs in maritime chaparral, coastal prairie, and coastal scrub.	March-April
<i>Ceanothus maritimus</i> maritime ceanothus Rhamnaceae	--/CR/1B.2	Endemic to San Luis Obispo.	Occurs on clay substrates within coastal bluff scrub, maritime chaparral, and valley and foothill grassland.	January-April

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<i>Centromadia parryi</i> ssp. <i>congdonii</i> Congdon's tarplant Asteraceae	--/--/1B.2	Alameda, Contra Costa, Monterey, Santa Clara, Santa Cruz*, San Luis Obispo, San Mateo, and Solano*.	Occurs on alkaline substrates within valley and foothill grassland.	May-November
<i>Centromadia parryi</i> ssp. <i>parryi</i> pappose tarplant Asteraceae	--/--/1B.2	Butte, Colusa, Glenn, Lake, Napa, San Luis Obispo, San Mateo, Solano, and Sonoma.	Often occurs on alkaline substrates within chaparral, coastal prairie, meadows and seeps, coastal salt marshes and swamps, and vernal mesic regions within valley and foothill grassland.	May-November
<i>Chenopodium littoreum</i> coastal goosefoot Chenopodiaceae	--/--/1B.2	Los Angeles, Santa Barbara, and San Luis Obispo.	Occurs in coastal dunes.	April-August
<i>Chlorogalum</i> <i>pomeridianum</i> var. <i>minus</i> dwarf soaproot Liliaceae	--/--/1B.2	Colusa, Lake, San Luis Obispo, Sonoma, and Tehama.	Occurs on serpentinite substrates within chaparral.	May-August
<i>Chlorogalum purpureum</i> var. <i>purpureum</i> Santa Lucia purple amole Liliaceae	FT/--/1B.1	Monterey and San Luis Obispo.	Occurs on gravelly or clay substrates within chaparral, cismontane woodland and valley and foothill grassland.	April-June
<i>Chlorogalum purpureum</i> var. <i>reductum</i> Camatta Canyon amole Liliaceae	FT/CR/1B.1	Endemic to San Luis Obispo.	Occurs in cismontane woodland and valley and foothill grassland.	April-May

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<i>Chorizanthe breweri</i> Brewer's spineflower Polygonaceae	--/--/1B.3	Monterey and San Luis Obispo.	Occurs on serpentinite, rocky, or gravelly substrates within closed-cone coniferous forest, chaparral, cismontane woodland, and coastal scrub.	April-August
<i>Chorizanthe douglasii</i> Douglas' spineflower Polygonaceae	--/--/4.3	Monterey, San Benito, and San Luis Obispo.	Occurs on sandy or gravelly substrates within chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest.	April-July
<i>Chorizanthe palmeri</i> Palmer's spineflower Polygonaceae	--/--/4.2	Monterey, Santa Barbara, San Benito?, and San Luis Obispo.	Occurs on rocky or serpentinite substrates within chaparral, cismontane woodland, and valley and foothill grassland.	April-August
<i>Chorizanthe pungens</i> var. <i>pungens</i> Monterey spineflower Polygonaceae	FT/--/1B.2	Monterey, Santa Cruz, and San Luis Obispo*.	Occurs on sandy substrates within maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland.	April-August
<i>Chorizanthe rectispina</i> Straight-awned spineflower Polygonaceae	--/--/1B.3	Monterey, Santa Barbara, and San Luis Obispo.	Occurs in chaparral, cismontane woodland, and coastal scrub.	April-July
<i>Chorizanthe ventricosa</i> potbellied spineflower Polygonaceae	--/--/4.3	Fresno, Monterey, San Benito, and San Luis Obispo.	Occurs on serpentinite substrates within cismontane woodland and valley and foothill grassland.	May-September

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<i>Cicuta maculata</i> var. <i>bolanderi</i> Bolander's water-hemlock Apiaceae	--/--/2.1	Contra Costa, Los Angeles*, Marin, Sacramento, Santa Barbara*, San Luis Obispo*, and Solano.	Occurs in freshwater or brackish marshes and swamps.	July-September
<i>Cirsium fontinale</i> var. <i>obispoense</i> San Luis Obispo fountain thistle Asteraceae	FE/CE/1B.2	Endemic to San Luis Obispo.	Occurs on serpentinite seeps and drainages within chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland.	February-September
<i>Cirsium occidentale</i> var. <i>compactum</i> compact cobwebby thistle Asteraceae	--/--/1B.2	Monterey?, San Francisco*, and San Luis Obispo.	Occurs in chaparral, coastal dunes, coastal prairie, and coastal scrub.	April-June
<i>Cirsium occidentale</i> var. <i>lucianum</i> Cuesta Ridge thistle Asteraceae	--/--/1B.2	Endemic to San Luis Obispo.	Occurs on serpentinite substrates, often on rocky slopes, along disturbed roadsides, and within openings in chaparral.	April-June
<i>Cirsium rathophilum</i> surf thistle Asteraceae	--/CT/1B.2	Santa Barbara and San Luis Obispo.	Occurs in coastal bluff scrub and coastal dunes.	April-June
<i>Cirsium scariosum</i> var. <i>loncholepis</i> La Grociosa thistle Asteraceae	FE/CT/1B.1	Monterey, Santa Barbara, and San Luis Obispo.	Occurs in mesic, sandy areas within cismontane woodland, coastal dunes, coastal scrub, brackish marshes and swamps, and valley and foothill grassland.	May-August
<i>Cladium californicum</i> California sawgrass Cyperaceae	--/--/2.2	Inyo, Los Angeles*, Riverside, Santa Barbara, San Bernardino, and San Luis Obispo.	Occurs in meadows and seeps and alkaline or freshwater marshes and swamps.	June-September

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<i>Clarkia speciosa</i> ssp. <i>immaculata</i> Pismo clarkia Onagraceae	FE/CR/1B.1	Endemic to San Luis Obispo.	Occurs on sandy substrates along margins and openings within chaparral, cismontane woodland, and valley and foothill grassland.	May-July
<i>Clinopodium mimuloides</i> monkey-flower savory Lamiaceae	--/--/4.2	Los Angeles, Monterey, Santa Barbara, San Luis Obispo, and Ventura.	Occurs along streambanks and in mesic areas within chaparral and north coast coniferous forest.	June-October
<i>Convolvulus simulans</i> small-flowered morning-glory Convolvulaceae	--/--/4.2	Contra Costa, Fresno, Kern, Los Angeles, Orange, Riverside, Santa Barbara, San Benito, San Clemente Island, Santa Catalina Island, Santa Cruz Island, San Diego, San Joaquin, San Luis Obispo, and Stanislaus.	Occurs on clay substrates and on serpentinite seeps within openings in chaparral, coastal scrub, and valley and foothill grassland.	March-July
<i>Corethrogyne leucophylla</i> branching beach aster Asteraceae <i>Corethrogyne filaginifolia</i> California aster	--/--/3.2 none	Monterey, Santa Cruz, San Luis Obispo, and San Mateo.	Occurs in closed-cone coniferous forest and coastal dunes.	May-December
<i>Deinandra halliana</i> Hall's tarplant Asteraceae	--/--/1B.1	Fresno, Monterey, San Benito, and San Luis Obispo.	Occurs on clay substrates, chenopod scrub, and cismontane woodland, and valley and foothill grassland.	April-May

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<i>Deinandra increscens</i> ssp. <i>foliosa</i> leafy tarplant Asteraceae	--/--/1B.2	Santa Barbara and San Luis Obispo.	Occurs on sandy substrates within valley and foothill grassland.	June-September
<i>Deinandra paniculata</i> paniculate tarplant	--/--/4.2			
<i>Delphinium gypsophilum</i> ssp. <i>gypsophilum</i> gypsum-loving larkspur Ranunculaceae	--/--/4.2	Alameda, Fresno, Kings, Kern, Madera, Merced, Monterey, San Benito, San Joaquin, San Luis Obispo, Stanislaus, and Ventura.	Occurs in chenopod scrub, cismontane woodland, and valley and foothill grassland.	February-May
<i>Delphinium gypsophilum</i> gypsum-loving larkspur	--/--/4.2			
<i>Delphinium gypsophilum</i> ssp. <i>parviflorum</i> small-flowered gypsum-loving larkspur Ranunculaceae	--/--/4.3	Monterey and San Luis Obispo.	Occurs in cismontane woodland and valley and foothill grassland.	March-June
<i>Delphinium gypsophilum</i> gypsum-loving larkspur	--/--/4.2			
<i>Delphinium parryi</i> ssp. <i>blochmaniae</i> dune larkspur Ranunculaceae	--/--/1B.2	Santa Barbara, San Luis Obispo, and Ventura.	Occurs in maritime chaparral and coastal dunes.	April-May

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<i>Delphinium parryi</i> ssp. <i>eastwoodiae</i> Eastwood's larkspur Ranunculaceae	--/--/1B.2	Endemic to San Luis Obispo.	Occurs on serpentinite substrates in coastal areas within openings in chaparral and valley and foothill grassland.	February-March
<i>Delphinium recurvatum</i> recurved larkspur Ranunculaceae	--/--/1B.2	Alameda, Butte*, Contra Costa, Colusa*, Fresno, Glenn, Kings, Kern, Madera, Merced, Monterey, San Joaquin, San Luis Obispo, Solano, Sutter, and Tulare.	Occurs on alkaline substrates within chenopod scrub, cismontane woodland, and valley and foothill grassland.	March-June
<i>Delphinium umbraculorum</i> umbrella larkspur Ranunculaceae	--/--/1B.2	Monterey, Santa Barbara, San Luis Obispo, and Ventura.	Occurs in cismontane woodland.	April-June
<i>Dithyrea maritima</i> beach spectaclepod Brassicaceae	--/CT/1B.1	Los Angeles*, Santa Barbara, Santa Catalina Island*, San Luis Obispo, San Miguel Island, San Nicolas Island, and Ventura.	Occurs in coastal dunes and sandy substrates within coastal scrub.	March-May
<i>Dudleya abramsii</i> ssp. <i>bettinae</i> Betty's dudleya Crassulaceae	--/--/1B.2	Endemic to San Luis Obispo.	Occurs on serpentinite or rocky substrates within chaparral, coastal scrub, and valley and foothill grassland.	May-July
<i>Dudleya abramsii</i> ssp. <i>murina</i> mouse-gray dudleya Crassulaceae	--/--/1B.3	Endemic to San Luis Obispo.	Occurs on serpentinite substrates within chaparral, cismontane woodland, and valley and foothill grassland.	May-June
<i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i> Blochman's dudleya Crassulaceae	--/--/1B.1	Los Angeles, Orange, Santa Barbara, San Diego, San Luis Obispo, and Ventura.	Occurs on rocky, often clay, or serpentinite substrates within coastal bluff scrub, chaparral, coastal scrub, and valley and foothill grassland.	April-June

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<i>Eleocharis parvula</i> small spikerush Cyperaceae	--/--/4.3	Butte, Contra Costa, Glenn, Humboldt, Mono, Napa, Orange, Plumas, Siskiyou, San Luis Obispo, Sonoma, and Ventura.	Occurs in marshes and swamps.	April-September
<i>Entosthodon kochii</i> Koch's cord moss Funariaceae	--/--/1B.3	Mendocino, Mariposa, Marin, and San Luis Obispo.	Occurs on soils within cismontane woodland.	Moss
<i>Eremalche kernensis</i> Kern mallow Malvaceae	FE/--/1B.1	Kern, San Luis Obispo, and Tulare.	Occurs in chenopod scrub and valley and foothill grassland.	March-May
<i>Eriastrum hooveri</i> Hoover's eriastrum Polemoniaceae	--/--/4.2	Fresno, Kings, Kern, Los Angeles, Santa Barbara, San Benito, and San Luis Obispo.	Sometimes occurs on gravelly substrates within chenopod scrub, pinyon and juniper woodland, and valley and foothill grassland.	March-July
<i>Eriastrum luteum</i> yellow-flowered eriastrum Polemoniaceae	--/--/1B.2	Monterey and San Luis Obispo.	Occurs on sandy or gravelly substrates within broadleafed upland forest, chaparral, and cismontane woodland.	May-June
<i>Erigeron blockmaniae</i> Blochman's leafy daisy Asteraceae	--/--/1B.2	Santa Barbara and San Luis Obispo.	Occurs in coastal dunes and coastal scrub.	June-August
<i>Erigeron sanctarum</i> saint's daisy Asteraceae	--/--/4.2	Santa Barbara, Santa Cruz Island, San Luis Obispo, and Santa Rosa Island.	Occurs in chaparral, cismontane woodland, and coastal scrub.	March-July
<i>Eriodictyon altissimum</i> Indian Knob mountainbalm Hydrophyllaceae	FE/CE/1B.1	Endemic to San Luis Obispo.	Occurs on sandstone substrates within maritime chaparral, cismontane woodland, and coastal scrub.	March-June

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<i>Eriogonum elegans</i> elegant wild buckwheat Polygonaceae	--/--/4.3	Monterey, Santa Barbara, San Benito, San Luis Obispo, and Ventura.	Usually occurs on sandy or gravelly substrates, often in washes, and sometimes roadsides within cismontane woodland and valley and foothill grassland.	May- November
<i>Eriogonum gossypinum</i> cottony buckwheat Polygonaceae	--/--/4.2	Fresno, Kings, Kern, and San Luis Obispo.	Occurs on clay substrates within chenopod scrub and valley and foothill grassland.	March- September
<i>Eriogonum nudum</i> var. <i>indictum</i> protruding buckwheat Polygonaceae	--/--/4.2	Fresno, Kern, Merced, Monterey, San Benito, and San Luis Obispo.	Occurs on clay or serpentinite substrates within chaparral, chenopod scrub, and cismontane woodland.	May- December
<i>Eriogonum temblorense</i> Temblor buckwheat Polygonaceae	--/--/1B.2	Fresno, Kern, Monterey, and San Luis Obispo.	Occurs on clay or sandstone substrates within valley and foothill grassland.	April- September
<i>Eryngium aristulatum</i> var. <i>hooveri</i> Hoover's button-celery Apiaceae	--/--/1B.1	Alameda, San Benito, Santa Clara*?, San Diego, and San Luis Obispo.	Occurs in vernal pools.	July-August
<i>Eryngium spinosepalum</i> spiny-sepaled button-celery Apiaceae	--/--/1B.2	Fresno, Kern, Madera, Merced, San Luis Obispo, Stanislaus, Tulare, and Tuolumne.	Occurs in valley and foothill grassland and vernal pools.	April-May

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<i>Erysimum capitatum</i> var. <i>lompocense</i> San Luis Obispo wallflower Brassicaceae <i>Erysimum capitatum</i> var. <i>capitatum</i> western wallflower	--/--/4.2 none	Santa Barbara and San Luis Obispo.	Occurs on sandy substrates within chaparral and coastal scrub.	February-May
<i>Erysimum insulare</i> ssp. <i>suffrutescens</i> suffrutescent wallflower Brassicaceae	--/--/4.2	Los Angeles, Santa Barbara, San Luis Obispo, and Ventura.	Occurs in coastal bluff scrub, maritime chaparral, coastal dunes, and coastal scrub.	January-July
<i>Eschscholzia hypocoides</i> San Benito poppy Papaveraceae	--/--/4.3	Fresno, Imperial, Mendocino, Monterey, San Benito, and San Luis Obispo.	Occurs on serpentinite or clay substrates within chaparral, cismontane woodland, and valley and foothill grassland.	March-June
<i>Eschscholzia rhombipetala</i> diamond-petaled California poppy Papaveraceae	--/--/1B.1	Alameda, Contra Costa*, Colusa*, San Joaquin, San Luis Obispo, and Stanislaus*.	Occurs on alkaline or clay substrates within valley and foothill grassland.	March-April
<i>Fritillaria agrestis</i> stinkbells Liliaceae	--/--/4.2	Alameda, Contra Costa, Fresno, Kern, Mendocino, Merced, Monterey, Mariposa, Placer, Sacramento, Santa Barbara, San Benito, Santa Clara, Santa Cruz*, San Luis Obispo, San Mateo*, Stanislaus, Tuolumne, Ventura, and Yuba.	Occurs on clay and sometimes serpentinite substrates within chaparral, cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland.	March-June

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<i>Fritillaria ojaiensis</i> Ojai fritillary Liliaceae	--/--/1B.2	Monterey?, Santa Barbara, San Luis Obispo?, and Ventura.	Occurs on rocky substrates and mesic areas within broadleafed upland forest, chaparral, and lower montane coniferous forest.	February-May
<i>Fritillaria viridea</i> San Benito fritillary Liliaceae	--/--/1B.2	Fresno, Monterey, San Benito, and San Luis Obispo.	Occurs on serpentinite substrates within chaparral.	March-May
<i>Galium andresii</i> ssp. <i>gatense</i> phlox-leaf serpentine bedstraw Rubiaceae	--/--/4.2	Alameda, Contra Costa, Colusa, Fresno, Los Angeles, Monterey, San Benito, Santa Clara, and San Luis Obispo.	Occurs on serpentinite or rocky substrates within chaparral, cismontane woodland, and lower montane coniferous forest.	April-July
<i>Galium californicum</i> ssp. <i>luciense</i> Cone Peak bedstraw Rubiaceae	--/--/1B.3	Monterey and San Luis Obispo.	Occurs in broadleafed upland forest, chaparral, cismontane woodland, and lower montane coniferous forest.	March-September
<i>Galium cliftonsmithii</i> Santa Barbara bedstraw Rubiaceae	--/--/4.3	Los Angeles, Monterey, Santa Barbara, San Luis Obispo, and Ventura.	Occurs in cismontane woodland.	May-July
<i>Galium hardamiae</i> Hardham's bedstraw Rubiaceae	--/--/1B.3	Monterey and San Luis Obispo.	Occurs on serpentinite substrates within closed-cone coniferous forest and chaparral.	April-October
<i>Gilia latiflora</i> ssp. <i>cuyamensis</i> Cuyama gilia Polemoniaceae	--/--/4.3	Kern, Los Angeles, Santa Barbara, San Luis Obispo?, and Ventura.	Occurs on sandy substrates within pinyon and juniper woodland.	April-June

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<i>Gilia leptantha</i> ssp. <i>pinetorum</i> pine gilia Polemoniaceae	--/--/4.3	Kern, Santa Barbara, San Luis Obispo, and Ventura.	Occurs on rocky or sandy substrates within lower montane coniferous forest.	May-July
<i>Gilia tenuiflora</i> ssp. <i>amplifaucalis</i> trumpet-throated gilia Polemoniaceae	--/--/4.3	Monterey and San Luis Obispo.	Occurs on sandy substrates within cismontane woodland and valley and foothill grassland.	March-April
<i>Grindelia hirsutula</i> var. <i>maritima</i> San Francisco gumplant Asteraceae <i>Grindelia hirsutula</i> gumplant	--/--/3.2 none	Monterey?, Marin, Santa Cruz?, San Francisco, San Luis Obispo, and San Mateo.	Occurs on sandy or serpentinite substrates within coastal bluff scrub, coastal scrub, and valley and foothill grassland.	June- September
<i>Hesperrevax caulescens</i> hogwallow starfish Asteraceae	--/--/4.2	Alameda, Amador, Butte, Contra Costa, Colusa, Fresno, Glenn, Kern, Merced, Monterey, Napa*, Sacramento, San Diego*, San Joaquin, San Luis Obispo, Solano, Stanislaus, Sutter, Tehama, and Yolo.	Occurs on mesic areas and clay substrates within valley and foothill grassland and in shallow vernal pools.	March-June
<i>Horkelia cuneata</i> ssp. <i>puberula</i> mesa horkelia Rosaceae	--/--/1B.1	Los Angeles, Orange, Riverside*, Santa Barbara, San Bernardino, San Diego*, San Luis Obispo, and Ventura.	Occurs on sandy or gravelly substrates within maritime chaparral, cismontane woodland, and coastal scrub.	February- September

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<i>Horkelia cuneata</i> ssp. <i>sericea</i> Kellogg's horkelia Rosaceae	--/--/1B.1	Alameda*, Monterey, Marin*, Santa Barbara, Santa Cruz, San Francisco*, San Luis Obispo, and San Mateo.	Occurs on sandy or gravelly substrates and in openings within closed-cone coniferous forest, maritime chaparral, coastal dunes, and coastal scrub.	April-September
<i>Horkelia yadonii</i> Santa Lucia horkelia Rosaceae	--/--/4.2	Monterey, Santa Barbara, and San Luis Obispo.	Occurs on granitic or sandy substrates within broadleafed upland forest, chaparral, cismontane woodland, meadows and seeps, and riparian woodland.	April-July
<i>Juncus acutus</i> ssp. <i>leopoldii</i> southwestern spiny rush Juncaceae	--/--/4.2	Imperial?, Los Angeles, Orange, Santa Barbara, San Diego, San Luis Obispo, and Ventura.	Occurs in mesic areas within coastal dunes, alkaline meadows and seeps, and coastal salt marshes and swamps.	March-June
<i>Juncus luciensis</i> Santa Lucia dwarf rush Juncaceae	--/--/1B.2	Lassen, Monterey, Modoc, Napa, Nevada, Placer, Plumas, Riverside, Santa Barbara, San Benito, San Diego, Shasta, and San Luis Obispo.	Occurs in chaparral, Great Basin scrub, lower montane coniferous forest, meadows and seeps, and vernal pools.	April-July
<i>Lasthenia californica</i> ssp. <i>macrantha</i> perennial goldfields Asteraceae	--/--/1B.2	Mendocino, Marin, San Luis Obispo, San Mateo, and Sonoma.	Occurs in coastal bluff scrub, coastal dunes, and coastal scrub.	January-November
<i>Lasthenia ferrisiae</i> Ferris' goldfields Asteraceae	--/--/4.2	Alameda, Butte, Contra Costa, Colusa, Fresno, Kings, Kern, Merced, Monterey, Sacramento, San Benito, San Joaquin, San Luis Obispo, Solano, Stanislaus, Tulare, Ventura, and Yolo.	Occurs in alkaline or clay vernal pools.	February-May

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<i>Lasthenia glabrata</i> ssp. <i>coulteri</i> Coulter's goldfields Asteraceae	--/--/1B.1	Colusa, Kern*, Los Angeles*, Merced, Orange, Riverside, Santa Barbara, San Bernardino*, San Diego, San Luis Obispo, Santa Rosa Island, Tehama, Tulare?, Ventura, and Yolo.	Occurs in coastal salt marshes and swamps, playas, and vernal pools.	February- June
<i>Lasthenia leptalea</i> Salinas Valley goldfields Asteraceae	--/--/4.3	Kern, Monterey, and San Luis Obispo.	Occurs in cismontane woodland and valley and foothill grassland.	February- April
<i>Layia heterotricha</i> pale-yellow layia Asteraceae	--/--/1B.1	Fresno, Kings*, Kern*, Los Angeles, Monterey, Santa Barbara, San Benito*?, San Luis Obispo*, and Ventura.	Occurs on alkaline or clay substrates within cismontane woodland, coastal scrub, pinyon and juniper woodland, and valley and foothill grassland.	March-June
<i>Layia jonesii</i> Jones' layia Asteraceae	--/--/1B.2	Endemic to San Luis Obispo.	Occurs on clay or serpentinite substrates within chaparral and valley and foothill grassland.	March-May
<i>Layia munzii</i> Munz's tidy-tips Asteraceae	--/--/1B.2	Fresno, Kern, and San Luis Obispo.	Occurs in chenopod scrub and on alkaline or clay soils within valley and foothill grassland .	March-April
<i>Lepidium jaredii</i> ssp. <i>album</i> Panoche pepper-grass Brassicaceae	--/--/1B.2	Fresno, San Benito, and San Luis Obispo.	Occurs on steep slopes and clay substrates within valley and foothill grassland.	February- June
<i>Lepidium jaredii</i> Jared's pepper-grass	--/--/1B.2			

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<i>Lepidium jaredii</i> ssp. <i>jaredii</i> Jared's pepper-grass Brassicaceae <i>Lepidium jaredii</i> Jared's pepper-grass	--/--/1B.2 --/--/1B.2	Kern and San Luis Obispo.	Occurs on alkaline or adobe substrates within valley and foothill grassland.	March-May
<i>Leptodactylon californicum</i> ssp. <i>tomentosum</i> fuzzy prickly-phlox Polemoniaceae <i>Linanthus californicus</i> linanthus	--/--/4.2 none	Santa Barbara and San Luis Obispo.	Occurs in coastal dunes.	March- August
<i>Leptosiphon grandiflorus</i> large-flowered leptosiphon Polemoniaceae	--/--/4.2	Alameda, Kern, Madera, Merced, Monterey, Marin, Santa Barbara*, Santa Clara, Santa Cruz, San Francisco, San Luis Obispo, San Mateo, and Sonoma.	Usually occurs on sandy substrates within coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, and valley and foothill grassland.	April-August
<i>Lessingia tenuis</i> spring lessingia Asteraceae	--/--/4.3	Alameda, Kern, Monterey, Santa Barbara, San Benito, Santa Clara, San Luis Obispo, Stanislaus, and Ventura.	Occurs in openings within chaparral, cismontane woodland, and lower montane coniferous forest.	May-July

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<i>Lilium humboldtii</i> ssp. <i>ocellatum</i> ocellated Humboldt lily Liliaceae	--/--/4.2	Anacapa Island, Los Angeles, Orange, Riverside, Santa Barbara, San Bernardino, Santa Cruz Island, San Diego, San Luis Obispo, Santa Rosa Island, and Ventura.	Occurs in openings within chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and riparian woodland.	March- August
<i>Lomatium parvifolium</i> small-leaved lomatium Apiaceae	--/--/4.2	Monterey, Santa Cruz, and San Luis Obispo.	Occurs on serpentinite substrates within closed-cone coniferous forest, chaparral, coastal scrub, and riparian woodland.	January-June
<i>Lotus formosissimus</i> harlequin lotus Fabaceae <i>Hosackia gracilis</i> harlequin lotus	--/--/4.2 --/--/4.2	Del Norte, Humboldt, Mendocino, Monterey, Marin, San Benito, Santa Cruz, San Francisco, San Luis Obispo, San Mateo, and Sonoma.	Occurs in wetlands and on roadsides within broadleafed upland forest, coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal prairie, coastal scrub, meadows and seeps, marshes and swamps, and north coast coniferous forest, and valley and foothill grassland.	March-July
<i>Lupinus cervinus</i> Santa Lucia lupine Fabaceae	--/--/4.3	Monterey and San Luis Obispo.	Occurs in broadleafed upland forest and lower montane coniferous forest.	May-June
<i>Lupinus ludovicianus</i> San Luis Obispo County lupine Fabaceae	--/--/1B.2	Endemic to San Luis Obispo.	Occurs on sandstone or sandy substrates within chaparral and cismontane woodland.	April-July
<i>Lupinus nipomensis</i> Nipomo Mesa lupine Fabaceae	FE/CE/1B.1	Endemic to San Luis Obispo.	Occurs on coastal dunes.	December- May

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<i>Madia radiata</i> showy golden madia Asteraceae	--/--/1B.1	Contra Costa*, Fresno, Kings*, Kern, Monterey* , Santa Barbara*, San Benito, Santa Clara, San Joaquin*, San Luis Obispo, and Stanislaus.	Occurs in cismontane woodland and valley and foothill grassland.	March-May
<i>Malacothamnus davidsonii</i> Davidson's bush-mallow Malvaceae	--/--/1B.2	Los Angeles, Monterey, Santa Clara, San Luis Obispo, and San Mateo.	Occurs in chaparral, cismontane woodland, coastal scrub, and riparian woodland.	June-January
<i>Malacothamnus gracilis</i> slender bush-mallow Malvaceae	--/--/4.3	Endemic to San Luis Obispo.	Occurs in chaparral.	June-October
<i>Malacothamnus jonesii</i> Jones' bush-mallow Malvaceae	--/--/4.3	Monterey and San Luis Obispo.	Occurs in chaparral and cismontane woodland.	May-July
<i>Malacothamnus niveus</i> San Luis Obispo County bush-mallow Malvaceae	--/--/4.3	Monterey, Santa Barbara, and San Luis Obispo.	Occurs in chaparral.	May-July
<i>Malacothamnus jonesii</i> Jone's bush-mallow	--/--/4.3			
<i>Malacothamnus palmeri</i> var. <i>involutus</i> Carmel Valley bush- mallow Malvaceae	--/--/1B.2	Monterey and San Luis Obispo.	Occurs in chaparral, cismontane woodland, and coastal scrub.	May-October
<i>Malacothamnus palmeri</i> var. <i>palmeri</i> Santa Lucia bush-mallow Malvaceae	--/--/1B.2	Monterey? and San Luis Obispo.	Occurs on rocky substrates within chaparral.	May-July

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<i>Malacothrix incana</i> dunedelion Asteraceae	--/--/4.3	Santa Barbara, San Clemente Island, Santa Cruz Island*, San Diego*, San Luis Obispo, San Miguel Island, San Nicolas Island, Santa Rosa Island, and Ventura.	Occurs in coastal dunes and coastal scrub.	January-October
<i>Malacothrix phaeocarpa</i> dusky-fruited malacothrix Asteraceae	--/--/4.3	Monterey, Santa Barbara, Santa Clara, and San Luis Obispo.	Occurs in openings and burned or disturbed areas within closed-cone coniferous forest and chaparral.	April-June
<i>Malacothrix saxatilis</i> var. <i>arachnoidea</i> Carmel Valley malacothrix Asteraceae	--/--/1B.2	Monterey, Santa Barbara, San Benito, and San Luis Obispo.	Occurs on rocky substrates within chaparral and in coastal scrub.	March-December
<i>Micropus amphibolus</i> Mt. Diablo cottonweed Asteraceae	--/--/3.2	Alameda, Contra Costa, Colusa, Lake, Monterey, Marin, Napa, Santa Barbara, Santa Clara, Santa Cruz, San Joaquin, San Luis Obispo, Solano, and Sonoma.	Occurs on rocky substrates within broadleafed upland forest, chaparral, cismontane woodland, and valley and foothill grassland.	March-May
<i>Microseris paludosa</i> marsh microseris Asteraceae	--/--/1B.2	Mendocino, Monterey, Marin, San Benito, Santa Cruz, San Francisco*, San Luis Obispo, San Mateo*, and Sonoma.	Occurs in closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland.	April-July
<i>Mimulus subsecundus</i> one-sided monkeyflower Scrophulariaceae	--/--/4.3	Fresno, Monterey, San Benito, and San Luis Obispo.	Occurs in lower montane coniferous forest.	May-July
<i>Mimulus fremontii</i> var. <i>fremontii</i> monkeyflower	none			

Scientific Name/ Common Name/ Family (Jepson Manual-1) (Jepson Manual-2)	Federal/State/ CRPR Status (Jepson Manual-1) (Jepson Manual-2)	County Distribution	Habitat Requirements	Phenology
<i>Monardella antonina</i> ssp. <i>benitensis</i> San Benito monardella Lamiaceae <i>Monardella villosa</i> ssp. <i>villosa</i> coyote-mint	--/--/4.3 none	Monterey, San Benito, and San Luis Obispo.	Usually occurs on serpentinite substrates within chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland.	June-July
<i>Monardella frutescens</i> San Luis Obispo monardella Lamiaceae <i>Monardella undulata</i> ssp. <i>undulata</i> San Luis Obispo monardella	--/--/1B.2 --/--/1B.2	Santa Barbara and San Luis Obispo.	Occurs on coastal dunes and sandy substrates within coastal scrub.	May-September
<i>Mondardella palmeri</i> Palmer's monardella Lamiaceae	--/--/1B.2	Monterey and San Luis Obispo.	Occurs on serpentinite substrates within chaparral and cismontane woodland.	June-August
<i>Mondardella undulata</i> curly-leaved monardella Lamiaceae <i>Monardella sinuata</i> ssp. <i>sinuata</i> monardella	--/--/4.2 none	Monterey, Marin, Santa Barbara, Santa Cruz, San Francisco, San Luis Obispo, San Mateo, and Sonoma.	Occurs on sandy substrates within closed-cone coniferous forest, chaparral, coastal dunes, coastal prairie, coastal scrub, and on ponderosa pine sandhills within lower montane coniferous forest.	May-September

Scientific Name/ Common Name/ Family (Jepson Manual-1) (Jepson Manual-2)	Federal/State/ CRPR Status (Jepson Manual-1) (Jepson Manual-2)	County Distribution	Habitat Requirements	Phenology
<i>Monardella crisp</i> crisp monardella Lamiaceae <i>Monardella undulata</i> ssp. <i>crispa</i> crisp monardella	--/--/1B.2 --/--/1B.2	Santa Barbara and San Luis Obispo.	Occurs in coastal dunes and coastal scrub.	April-August
<i>Monolopia congdonii</i> San Joaquin woollythreads Asteraceae	FE/--/1B.2	Fresno, Kings, Kern, Santa Barbara, San Benito, San Luis Obispo, and Tulare*.	Occurs in chenopod scrub and sandy substrates within valley and foothill grassland.	February-May
<i>Monolopia gracilens</i> woodland woollythreads Asteraceae	--/--/1B.2	Alameda, Contra Costa, Monterey, Santa Clara, Santa Cruz, San Luis Obispo, and San Mateo.	Occurs on serpentinite substrates within openings in broadleaved upland forest, chaparral, and north coast coniferous forest, and in cismontane woodland, and valley and foothill grassland.	February-July
<i>Mucronea californica</i> California spineflower Polygonaceae	--/--/4.2	Kern, Los Angeles, Monterey, Riverside, Santa Barbara, San Bernardino, San Diego, San Luis Obispo, and Ventura.	Occurs on sandy substrates within chaparral, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland.	March-August
<i>Nasturtium gambelii</i> Gambel's water cress Brassicaceae	FE/CT/1B.1	Los Angeles, Orange, Santa Barbara, San Bernardino*, San Diego, and San Luis Obispo.	Occurs in freshwater or brackish marshes and swamps.	April-October
<i>Navarretia fossalis</i> Moran's nosegay Polemoniaceae	FT/--/1B.1	Los Angeles, Riverside, San Diego, and San Luis Obispo.	Occurs in chenopod scrub, assorted shallow freshwater marshes and swamps, playas, and vernal pools.	April-June

Scientific Name/ Common Name/ Family (Jepson Manual-1) (Jepson Manual-2)	Federal/State/ CRPR Status (Jepson Manual-1) (Jepson Manual-2)	County Distribution	Habitat Requirements	Phenology
<i>Navarretia nigelliformis</i> ssp. <i>radians</i> shining navarretia Polemoniaceae	--/--/1B.2	Alameda, Contra Costa, Fresno, Merced, Monterey, San Benito, San Joaquin, and San Luis Obispo.	Occurs in cismontane woodland, valley and foothill grassland, and vernal pools.	April-July
<i>Navarretia prostrata</i> prostrate vernal pool navarretia Polemoniaceae	--/--/1B.1	Alameda, Fresno, Los Angeles, Merced, Monterey, Orange, Riverside, San Bernardino?*, San Benito, San Diego, and San Luis Obispo.	Occurs in mesic areas within coastal scrub, meadows and seeps, alkaline valley and foothill grassland, and vernal pools.	April-July
<i>Nemacladus secundiflorus</i> var. <i>robbinsii</i> nemacladus Campanulaceae	--/--/1B.2	Los Angeles, Santa Barbara, San Benito, San Luis Obispo, and Ventura.	Occurs in openings within chaparral and valley and foothill grassland.	April-June
<i>Nemacladus secundiflorus</i> var. <i>secundiflorus</i> large-flowered nemacladus Campanulaceae	--/--/4.3	Kern, Monterey, San Luis Obispo, and Tulare.	Occurs on gravelly substrates and openings within chaparral and valley and foothill grassland.	April-June
<i>Orobanche parishii</i> ssp. <i>brachyloba</i> short-lobed broomrape Orobanchaceae	--/--/4.2	Los Angeles, Santa Barbara, Santa Catalina Island, Santa Cruz Island, San Diego, San Luis Obispo, San Miguel Island, San Nicolas Island, Santa Rosa Island, and Ventura.	Occurs on sandy substrates within coastal bluff scrub, coastal dunes, and coastal scrub.	April-October
<i>Pedicularis dudleyi</i> Dudley's lousewort Scrophulariaceae	--/CR/1B.2	Monterey, Santa Cruz*, San Luis Obispo, and San Mateo.	Occurs in maritime chaparral, cismontane woodland, north coast coniferous forest, and valley and foothill grassland.	April-June
<i>Pentachaeta fragilis</i> fragile pentachaeta Asteraceae	--/--/4.3	Kern, Madera, Merced, Monterey, Santa Barbara, San Luis Obispo, Tuolumne, and Ventura.	Often occurs in openings within chaparral and sandy substrates within lower montane coniferous forest.	March-June

Scientific Name/ Common Name/ Family (Jepson Manual-1) (Jepson Manual-2)	Federal/State/ CRPR Status (Jepson Manual-1) (Jepson Manual-2)	County Distribution	Habitat Requirements	Phenology
<i>Perideridia gairdneri</i> ssp. <i>gairdneri</i> Gairdner's yampah Apiaceae	--/--/4.2	Contra Costa, Kern, Los Angeles*, Mendocino, Monterey, Marin, Napa, Orange*, San Benito, Santa Clara, Santa Cruz, San Diego*, San Luis Obispo, San Mateo*?, Solano, and Sonoma.	Occurs in vernal mesic areas within broadleaved upland forest, chaparral, coastal prairie, valley and foothill grassland, and vernal pools.	June-October
<i>Perideridia pringlei</i> adobe yampah Apiaceae	--/--/4.3	Kern, Los Angeles, Monterey, Santa Barbara, San Luis Obispo, Tulare, and Ventura.	Occurs on serpentinite and often clay substrates within chaparral, cismontane woodland, coastal scrub, and pinyon and juniper woodland.	April-July
<i>Phacelia ramosissima</i> var. <i>austrolitoralis</i> south coast branching phacelia Boraginaceae	--/--/3.2	Los Angeles, Monterey?, Orange, Santa Barbara, San Diego, San Luis Obispo?, and Ventura.	Occurs on sandy, sometimes rocky substrates within chaparral, coastal dunes, coastal scrub, and coastal salt marshes and swamps.	March- August
<i>Phacelia ramosissima</i> phacelia	none			
<i>Pinus radiata</i> Monterey pine Pinaceae	--/--/1B.1	Monterey, Santa Cruz, San Luis Obispo, and San Mateo.	Occurs in closed-cone coniferous forest and cismontane woodland.	Evergreen Tree
<i>Piperia leptopetala</i> narrow-petaled rein orchid Orchidaceae	--/--/4.3	El Dorado, Fresno, Lake, Los Angeles, Monterey, Mariposa, Nevada, Orange, Plumas, Riverside, San Bernardino, San Benito, Santa Clara, San Diego, Shasta, Siskiyou, San Luis Obispo, Sonoma, and Tulare.	Occurs in cismontane woodland, lower montane coniferous forest, and upper montane coniferous forest.	May-July

Scientific Name/ Common Name/ Family (Jepson Manual-1) (Jepson Manual-2)	Federal/State/ CRPR Status (Jepson Manual-1) (Jepson Manual-2)	County Distribution	Habitat Requirements	Phenology
<i>Piperia michaelii</i> Michael's rein orchid Orchidaceae	--/--/4.2	Alameda, Amador, Butte, Contra Costa, Fresno, Humboldt, Los Angeles*, Monterey, Marin, Santa Barbara, San Benito, Santa Clara, Santa Cruz, Santa Cruz Island, San Francisco, San Luis Obispo, San Mateo, Stanislaus, Tulare, Tuolumne, Ventura*?, and Yuba.	Occurs in coastal bluff scrub, closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest.	April-August
<i>Plagiobothrys chorisianus</i> var. <i>hickmanii</i> Hickman's popcorn-flower Boraginaceae	--/--/4.2	Monterey, San Benito, Santa Clara, Santa Cruz, San Luis Obispo, and San Mateo?.	Occurs in closed-cone coniferous forest, chaparral, coastal scrub, marshes and swamps, and vernal pools.	April-June
<i>Plagiobothrys uncinatus</i> hooked popcorn flower Boraginaceae	--/--/1B.2	Monterey, San Benito, Santa Clara, San Luis Obispo, and Stanislaus.	Occurs on sandy substrates within chaparral, cismontane woodland, and valley and foothill grassland.	April-May
<i>Poa diabolii</i> Diablo Canyon bluegrass Poaceae	--/--/1B.2	Endemic to San Luis Obispo.	Occurs on shale substrates and sometimes burned areas within closed-cone coniferous forest, mesic areas within chaparral, cismontane woodland, and coastal scrub.	March-April
<i>Prunus fasciculata</i> var. <i>punctata</i> sand almond Rosaceae	--/--/4.3	Santa Barbara and San Luis Obispo.	Occurs on sandy substrates within maritime chaparral, cismontane woodland, coastal dunes, and coastal scrub.	March-April

Scientific Name/ Common Name/ Family (Jepson Manual-1) (Jepson Manual-2)	Federal/State/ CRPR Status (Jepson Manual-1) (Jepson Manual-2)	County Distribution	Habitat Requirements	Phenology
<i>Pseudognaphalium leucocephalum</i> white rabbit-tobacco Asteraceae	--/--/2.2	Los Angeles (LAX), Orange (ORA), Riverside (RIV), Santa Barbara (SBA), San Diego (SDG), San Luis Obispo (SLO), Ventura Los Angeles, Orange, Riverside, Santa Barbara, San Diego, San Luis Obispo, and Ventura.	Occurs on sandy or gravelly substrates within chaparral, cismontane woodland, coastal scrub, and riparian woodland.	July-December
<i>Ribes sericeum</i> Santa Lucia gooseberry Grossulariaceae	--/--/4.3	Monterey and San Luis Obispo.	Occurs in broadleafed upland forest, coastal bluff scrub, and north coast coniferous forest.	February-April
<i>Sanicula hoffmanii</i> Hoffmann's sanicle Apiaceae	--/--/4.3	Monterey, Santa Barbara, Santa Cruz, Santa Cruz Island, San Luis Obispo, San Mateo, and Santa Rosa Island.	Often occurs on serpentinite or clay substrates within broadleafed upland forest, chaparral, and coastal scrub.	March-May
<i>Sanicula maritima</i> adobe sanicle Apiaceae	--/CR/1B.1	Alameda*, Monterey, San Francisco*, and San Luis Obispo.	Occurs on clay and serpentinite substrates within chaparral, coastal prairie, meadows and seeps, and valley and foothill grassland.	February-May
<i>Scrophularia atrata</i> black-flowered figwort Scrophulariaceae	--/--/1B.2	Santa Barbara and San Luis Obispo.	Closed-cone coniferous forest • Chaparral • Coastal dunes • Coastal scrub • Riparian scrub Occurs in closed-cone coniferous forest, chaparral, coastal dunes, coastal scrub, and riparian scrub.	March-July

Scientific Name/ Common Name/ Family (Jepson Manual-1) (Jepson Manual-2)	Federal/State/ CRPR Status (Jepson Manual-1) (Jepson Manual-2)	County Distribution	Habitat Requirements	Phenology
<i>Senecio aphanactis</i> chaparral ragwort Asteraceae	--/--/2.2	Alameda, Contra Costa, Fresno, Los Angeles, Merced, Monterey, Orange, Riverside, Santa Barbara, Santa Clara, Santa Catalina Island, Santa Cruz Island, San Diego, San Luis Obispo, Solano, Santa Rosa Island, and Ventura.	Sometimes occurs on alkaline substrates within chaparral, cismontane woodland, and coastal scrub.	January-April
<i>Senecio astephanus</i> San Gabriel ragwort Asteraceae	--/--/4.3	Kern, Los Angeles, Monterey, Santa Barbara, San Bernardino, San Diego, and San Luis Obispo.	Occurs on rocky slopes within coastal bluff scrub and chaparral.	May-July
<i>Senecio blochmaniae</i> Blochman's ragwort Asteraceae	--/--/4.2	Santa Barbara and San Luis Obispo.	Occurs in coastal dunes.	May-October
<i>Sidalcea hickmanii</i> ssp. <i>anomala</i> Cuesta Pass checkerbloom Malvaceae	--/CR/1B.2	Endemic to San Luis Obispo.	Occurs on rocky or serpentinite substrates within closed-cone coniferous forest and chaparral.	May-June
<i>Sidalcea hickmanii</i> ssp. <i>parishii</i> Parish's checkerbloom Malvaceae	--/CR/1B.2	Santa Barbara, San Bernardino, and San Luis Obispo.	Occurs in chaparral, cismontane woodland, and lower montane coniferous forest.	June-August
<i>Stebbinsoseris decipiens</i> Santa Cruz microseris Asteraceae	--/--/1B.2	Monterey, Marin, Santa Cruz, San Francisco, San Luis Obispo, and San Mateo.	Occurs in open areas and sometimes serpentinite substrates within broadleaved upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland.	April-May

Scientific Name/ Common Name/ Family (Jepson Manual-1) (Jepson Manual-2)	Federal/State/ CRPR Status (Jepson Manual-1) (Jepson Manual-2)	County Distribution	Habitat Requirements	Phenology
<i>Streptanthus albidus</i> ssp. <i>peramoenus</i> most beautiful jewel- flower Brassicaceae <i>Streptanthus glandulosus</i> ssp. <i>glandulosus</i> jewelflower	--/--/1B.2 none	Alameda, Contra Costa, Monterey, Santa Clara, and San Luis Obispo.	Occurs on serpentinite substrates within chaparral, cismontane woodland, and valley and foothill grassland.	March-October
<i>Stylocline masonii</i> Mason's neststraw Asteraceae	--/--/1B.1	Kern, Los Angeles, Monterey, and San Luis Obispo.	Occurs on sandy substrates within chenopod scrub and pinyon and juniper woodland.	March-May
<i>Suaeda californica</i> California seablite Chenopodiaceae	FE/--/1B.1	Alameda*, Contra Costa*, Santa Clara*, San Francisco*, and San Luis Obispo.	Occurs in coastal salt marshes and swamps.	July-October
<i>Suaeda taxifolia</i> woolly seablite Chenopodiaceae	--/--/4.2	Anacapa Island, Los Angeles, Orange, Santa Barbara, Santa Barbara Island, San Clemente Island, Santa Catalina Island, Santa Cruz Island, San Diego, San Luis Obispo, San Nicolas Island, Santa Rosa Island, and Ventura.	Occurs on coastal bluff scrub, coastal dunes, and along the margins of coastal salt marshes and swamps.	January-December
<i>Symphyotrichum defoliatum</i> San Bernardino aster Asteraceae	--/--/1B.2	Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Diego, and San Luis Obispo?.	Occurs near ditches, streams, and springs within cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, and vernal mesic areas within valley and foothill grassland.	July-November

Scientific Name/ Common Name/ Family (Jepson Manual-1) (Jepson Manual-2)	Federal/State/ CRPR Status (Jepson Manual-1) (Jepson Manual-2)	County Distribution	Habitat Requirements	Phenology
<i>Systemotheca vortriedei</i> Vortriede's spineflower Polygonaceae	--/--/4.3	Monterey and San Luis Obispo.	Occurs on sandy or serpentinite substrates within chaparral and cismontane woodland.	May-September
<i>Toxicoscordion fontanum</i> marsh zigadenus Melanthiaceae	--/--/4.2	Lake, Mendocino, Monterey, Marin, Napa, San Benito, Santa Cruz, San Luis Obispo, San Mateo, and Sonoma.	Occurs on vernal mesic areas and often serpentinite substrates within chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, and marshes and swamps.	April-July
<i>Trifolium hydrophilum</i> saline clover Fabaceae	--/--/1B.2	Alameda, Contra Costa, Colusa?, Lake, Monterey, Napa, Sacramento, San Benito, Santa Clara, Santa Cruz, San Luis Obispo, San Mateo, Solano, Sonoma, and Yolo.	Occurs in marshes and swamps, mesic or alkaline areas within valley and foothill grassland, and vernal pools.	April-June
<i>Triteleia ixiodes</i> ssp. <i>cookii</i> Cook's triteleia Liliaceae	--/--/1B.3	Monterey and San Luis Obispo.	Occurs in serpentinite seeps within closed-cone coniferous forest and cismontane woodland.	May-June
<i>Tropidocarpum capparideum</i> caper-fruited tropidocarpum Brassicaceae	--/--/1B.1	Alameda*, Contra Costa*, Fresno, Glenn*, Monterey, Santa Clara*, San Joaquin*, and San Luis Obispo.	Occurs on alkaline hills within valley and foothill grassland.	March-April

STATUS CODES

FEDERAL: United States Fish and Wildlife Service

FE Federally Listed Endangered
FT Federally Listed Threatened

STATE: California Department of Fish and Game

CE California Listed Endangered
CT California Listed Threatened
CR California Listed Rare

CRPR: California Rare Plant Rank (California Native Plant Society)

1B Plants Rare, Threatened, or Endangered in California and Elsewhere
2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
3 Plants About Which We Need More Information - A Review List
4 Plants of Limited Distribution - A Watch List

Threat Ranks

- 0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
- 0.2-Fairly threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
- 0.3-Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

? Uncertain About Distribution or Identity
* May be Extirpated

SOURCE: CDFG, 2003 and CNPS, 2012

APPENDIX C

SPECIAL STATUS PLANT SPECIES NOT INCLUDED IN THE ANALYSIS

Scientific Name/ Common Name/Family (Jepson Manual-1) (Jepson Manual-2)	CRPR Status (Jepson Manual-1) (Jepson Manual-2)
<i>Allium howellii</i> var. <i>clokeyi</i> Mt. Pinos onion Liliaceae	--/--/1B.2
<i>Arctostaphylos montereyensis</i> Toro manzanita Ericaceae	--/--/1B.2
<i>Aspidotis carlotta-halliae</i> Carlotta Hall's lace fern Pteridaceae	--/--/4.2
<i>Atriplex cordulata</i> heartscale Chenopodiaceae	--/--/1B.2
<i>Atriplex cordulata</i> var. <i>cordulata</i> heartscale	--/--/1B.2
<i>Atriplex cordulata</i> var. <i>erecticaulis</i> earlimart orach	--/--/1B.2
<i>Atriplex coronata</i> var. <i>coronata</i> crownscale Chenopodiaceae	--/--/4.2
<i>Atriplex coulteri</i> Coulter's saltbush Chenopodiaceae	--/--/1B.2
<i>Atriplex joaquiniana</i> San Joaquin spearscale Chenopodiaceae	--/--/1B.2
<i>Atriplex serenana</i> var. <i>davidsonii</i> Davidson's saltscale Chenopodiaceae	--/--/1B.2
<i>Atriplex vallicola</i> Lost Hills crownscale Chenopodiaceae	--/--/1B.2
<i>Atriplex coronata</i> var. <i>vallicola</i> Lost Hills crownscale	
<i>Calyptridium parryi</i> var. <i>hesseae</i> Santa Cruz Mountains pussypaws Portulacaceae	--/--/1B.1
<i>Castilleja ambigua</i> ssp. <i>ambigua</i> Johnny-nip Scrophulariaceae	--/--/4.2
<i>Centromadia parryi</i> ssp. <i>parryi</i> pappose tarplant Asteraceae	--/--/1B.2

Scientific Name/ Common Name/Family (Jepson Manual-1) (Jepson Manual-2)	CRPR Status (Jepson Manual-1) (Jepson Manual-2)
<i>Chorizanthe pungens</i> var. <i>pungens</i> Monterey spineflower Polygonaceae	FT/--/1B.2
<i>Cladium californicum</i> California sawgrass Cyperaceae	--/--/2.2
<i>Eriastrum hooveri</i> Hoover's eriastrum Polemoniaceae	--/--/4.2
<i>Eriogonum nudum</i> var. <i>indictum</i> protruding buckwheat Polygonaceae	--/--/4.2
<i>Fritillaria viridea</i> San Benito fritillary Liliaceae	--/--/1B.2
<i>Gilia leptantha</i> ssp. <i>pinetorum</i> pine gilia Polemoniaceae	--/--/4.3
<i>Lepidium jaredii</i> ssp. <i>album</i> Panoche pepper-grass Brassicaceae	--/--/1B.2
<i>Lepidium jaredii</i> Jared's pepper-grass	--/--/1B.2
<i>Leptosiphon grandiflorus</i> large-flowered leptosiphon Polemoniaceae	--/--/4.2
<i>Lilium humboldtii</i> ssp. <i>ocellatum</i> ocellated Humboldt lily Liliaceae	--/--/4.2
<i>Malacothamnus davidsonii</i> Davidson's bush-mallow Malvaceae	--/--/1B.2
<i>Malacothamnus palmeri</i> var. <i>involucratus</i> Carmel Valley bush-mallow Malvaceae	--/--/1B.2
<i>Malacothrix saxatilis</i> var. <i>arachnoidea</i> Carmel Valley malacothrix Asteraceae	--/--/1B.2
<i>Micropus amphibolus</i> Mt. Diablo cottonweed Asteraceae	--/--/3.2
<i>Monardella antonina</i> ssp. <i>benitensis</i> San Benito monardella Lamiaceae	--/--/4.3

Scientific Name/ Common Name/Family (Jepson Manual-1) (Jepson Manual-2)	CRPR Status (Jepson Manual-1) (Jepson Manual-2)
<i>Monardella villosa</i> ssp. <i>villosa</i> coyote-mint	none
<i>Monardella crisp</i> crisp monardella Lamiaceae	--/--/1B.2
<i>Monardella undulata</i> ssp. <i>crispa</i> crisp monardella	--/--/1B.2
<i>Monardella frutescens</i> San Luis Obispo monardella Lamiaceae	--/--/1B.2
<i>Monardella undulata</i> ssp. <i>undulata</i> San Luis Obispo monardella	--/--/1B.2
<i>Navarretia prostrata</i> prostrate vernal pool navarretia Polemoniaceae	--/--/1B.1
<i>Nemacladus secundiflorus</i> var. <i>robbinsii</i> nemacladus Campanulaceae	--/--/1B.2
<i>Orobanche parishii</i> ssp. <i>brachyloba</i> short-lobed broomrape Orobanchaceae	--/--/4.2
<i>Piperia leptopetala</i> narrow-petaled rein orchid Orchidaceae	--/--/4.3
<i>Plagiobothrys chorisianus</i> var. <i>hickmanii</i> Hickman's popcorn-flower Boraginaceae	--/--/4.2
<i>Pseudognaphalium leucocephalum</i> white rabbit-tobacco Asteraceae	--/--/2.2
<i>Stebbinsoseris decipiens</i> Santa Cruz microseris Asteraceae	--/--/1B.2
<i>Toxicoscordion fontanum</i> marsh zigadenus Melanthiaceae	--/--/4.2
<i>Trifolium hydrophilum</i> saline clover Fabaceae	--/--/1B.2