

CONSERVATION OF GLOBALLY AND LOCALLY RARE PLANT TAXA IN NAPA
COUNTY, CALIFORNIA

by

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We certify that we have read this study and that it conforms to acceptable standards of scholarly presentation and is fully acceptable, in scope and quality, as a thesis for the degree of Master of Arts.

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ABSTRACT

Conservation of Globally and Locally Rare Plant Taxa in Napa County, California

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Napa County is located within a global biodiversity hotspot, and is one of ten localized areas in California that contain the highest numbers of native and endemic plant species. Conservation of rare taxa is an important issue and the research presented here focuses on the globally, sub-nationally, and locally rare plants of Napa County. Initially, a checklist of the flora of Napa County is developed by combining and reviewing local and statewide data sources. Next, a local rarity classification system is developed and tested. Using a geographic information system, the distributions and hotspots, of globally, sub-nationally, *and* locally rare plants in Napa County are identified. Finally, correlation between rarity, habitat types, and protected lands are assessed. The final native plant checklist for Napa County includes 1418 taxa. At global and sub-national assessment scales, 126 native taxa in Napa County are listed as rare or threatened by the California Natural Diversity Database element ranking system. Additionally, 89 taxa meet the area of occupancy criteria for rarity status at the local assessment scale. Analysis of the distributions of all rare plant taxa indicates that there are several rarity hotspots in Napa County that only somewhat correspond among different assessment scales as well as with specific habitats and current protected lands. Results from this study make it

apparent that Napa County contains remarkably high levels of plant diversity and intense concentrations of special status taxa in several locations. Multiple conservation strategies are necessary to protect the flora of this unique area.

DEDICATION

Dedicated to
Margret Crain, Sylvia Lauria,
& Ernest T. Browndog

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CHAPTER 1-

THESIS INTRODUCTION

The present work is a case study focusing on rare plant taxa within the flora of Napa County, California. The overall objective is to analyze current biogeographical data to aid in development of a systematic conservation plan (see Margules & Pressey 2000) for rare plants in Napa County. The process is consistent with the initial stages of Margules and Pressey's (2000) six stages in systematic conservation planning, which include compiling biodiversity data, identification of conservation goals, review of existing reserves, and selection of additional conservation areas. The research presented here focuses on the compilation of pre-existing biodiversity data to identify rare plant conservation targets based on richness measures and habitat correlation. A review of existing conservation areas and suggestions for additional conservation areas and conservation strategies are also presented.

To achieve this goal, several steps were undertaken. First, several data sets were compiled and updated to create a checklist of vascular plants of Napa County. Included on the checklist is existing information on globally and sub-nationally rare plant taxa. Next, a new system for categorizing locally rare plant taxa was developed and applied to the Napa County flora. Finally, rare plant richness was analyzed using ArcGIS 9.1, and the distributions were compared to habitat types and protected land distributions to identify conservation goals and gaps.

Chapter two presents an updated compilation of floristic data from Napa County. Although Napa County has long been recognized as a location with an extremely diverse flora including numerous rare taxa as compared to other counties in California (Majors 1963), no current plant checklist for the area exists. In chapter two, available floristic data is reviewed, updated, and augmented to develop a current checklist plant checklist for Napa County. The goal is to provide valuable information on the flora of Napa County that can be used for comparisons with floras of other regions and well as to guide future research and conservation efforts in the area.

As part of the first stage of systematic conservation planning, Margules and Pressey (2000) emphasize the need to collect data on rare taxa as these taxa are likely to be missed during conservation planning. Information available on the rarity status of plant taxa in Napa County is included on the plant checklist presented here. In addition, chapter three introduces a system for the classification of locally rare taxa. In chapter four, this system is applied to the flora of Napa County to identify locally rare taxa, and the results are included on the final checklist.

Chapter four also outlines conservation targets and goals by mapping the distributions of rare plant taxa using ArcGIS 9.1. Richness hotspots of globally, sub-nationally, and locally rare plant taxa are identified as priority conservation targets in an effort to protect numerous rare taxa in a minimal area. The distributions of these targets are compared to those of various habitat types (Thorne et al. 2004) to identify potentially significant habitats for rare plant conservation efforts. Finally, priority conservation areas

are outlined by reviewing the distributions of protected lands and noting correspondence with rare plant taxa and rarity richness hotspots. Conservation strategies are put forth for prioritized conservation areas based on their level of correspondence with protected land (Rosenzweig 2003).

The research presented here provides a significant foundation for continuing research on rare plant conservation in Napa County. Each chapter is outlined as an individual manuscript; all citations are included at the end. Data presented here are intended to compliment data from other locations within the California Floristic Province as well as other taxonomic groups and global diversity hotspots.

CHAPTER 2-

AN ANNOTATED CHECKLIST OF THE VASCULAR PLANTS OF NAPA COUNTY, CALIFORNIA

Introduction

Background

California is considered one of the most biologically diverse regions of the world today (Orme et al. 2005; Brooks et al. 2006), and is identified as one of 25 global hotspots of biodiversity (Myers et al. 2000). Within the United States, California ranks high on the list of areas with large numbers of endangered species (Dobson et al. 1997) and corresponds with one of the national hotspots of imperiled biodiversity (Abbitt et al 2000; Chaplin et al. 2000).

Within California, Napa County contains particularly high levels of diversity in a variety of categories ranging from plants to amphibians (Parisi 2003) and is considered one of ten local areas that contain the richest concentrations of native and endemic plant species (Stebbins & Major 1965; Thorne et al. 2004). Alas, Napa County also ranks in the highest categories for human population densities, contributing directly to habitat degradation, the leading cause of species loss in California (Parisi 2003).

Recent authors have argued that developing checklists for use in all fields of biological research is critical to understanding and conserving biodiversity (Droege et al. 1998;

Crane 2004). Over 40 years ago, Stebbins and Major (1965) encouraged the development of county level plant checklists, and prioritized regions such as Napa County.

Previous floristic studies on California have included taxa from Napa County (Major 1963; Hickman 1993), but to date no checklist developed specifically for the region exists. Floras and checklists that include listings for Napa County are outdated (Major 1963), incomplete (Callizo et al. 1997), or only provide information on a statewide scale (Hickman 1993). Developed here is a comprehensive annotated vascular plant checklist for Napa County that includes information on rarity, and is applicable to global, state, and local research and conservation planning efforts.

Geography

Largely due to its reputation as one of the world's premier viticultural regions, Napa County is rich with geographical data (Stoms et al 2005). It is located north of San Pablo Bay in the coastal mountains between 38.15° and 38.86°N latitude and between 122.64° and 122.06°W longitude. Its total surface area comprises about 2052 km² making it the eighth smallest of the 58 counties within the state of California and equating to only 0.5% of California's total surface area of 403,932 km² (U. S. Census Bureau 2000).

Napa County encompasses the majority of the Napa River and Putah Creek watersheds, which drain into San Pablo Bay and Lake Berryessa respectively, as well as a small portion of the Suisan Creek watershed (Lambert & Kashiwagi 1978). As part of

the California Coast Range, elevation in Napa varies from sea level to around 1307 meters in the Mayacamas Mountains, which roughly define the County's northern and western borders. The Blue Ridge, the Rocky Ridge, and the Vaca Mountains represent Napa's eastern extent (Lambert & Kashiwagi 1978; Miles et al. 1997).

Geology

Several major bedrock units composed mainly of sedimentary, volcanic, and ultramafic rocks from the Cenozoic and Mesozoic periods (Miles et al. 1997; Harden 2004) contribute parent material to the soil associations found in Napa County. Lambert and Kashiwagi (1978) describe four of the eleven resulting soil associations covering roughly 16% of the county as well drained to poorly drained, nearly level to moderately steep soils on alluvial fans, on flood plains, in basins, on tidal flats, and on terraces. They describe the other seven associations, which cover 84% of the county, as excessively drained to well drained, gently sloping to very steep soils on uplands (Lambert & Kashiwagi 1978).

Climate

Napa County is located within one of the five regions in the world generally characterized by a Mediterranean climate (see Dallman 1998). Relatively mild, wet winters, warm dry summers, and long growing seasons are standard for the county (Hickman 1993; Ornduff et al. 2003; Parisi 2003). Detailed maps show that Napa encompasses at least three unique climatic zones that combine maritime and interior

influences (Hickman 1993). Average maximum temperatures range from 50° to over 100° Fahrenheit and annual rainfall in the County ranges from ~15 to 55 inches per year (Lambert & Kashiwagi 1978).

Vegetation

The varied geography of Napa County leads to an extremely diverse flora (Hickman 1993; Ornduff et al. 2003; Parisi 2003). Despite Napa County's relatively small size, it is divided into two geographical regions and three geographical subregions within the California Floristic Province. The majority of the county is included in the North Coast Ranges subregion of the Northwestern California region. The remaining portion of the county is included in the San Francisco Bay Area and Central Coast subregions of the Central Western California region (Hickman 1993). Nearly 60 vegetation cover types growing in a variety of ecological niches have been identified and mapped in Napa County (Thorne et al. 2004).

Methods

Checklist Development

To create a checklist of the vascular flora of Napa County, several local and statewide data sources that include plant collection records from Napa County were combined. Initially, available data for Napa were pooled from three online databases for the State of California: *The Jepson Herbaria Online Interchange for California Floristics* SMASCH Database (<http://ucjeps.berkeley.edu/interchange.html>) (Jepson Flora Project

2005), the *California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants* (<http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi>) (CNPS 2005), and *Calflora: Information on California Plants for Education, Research, and Conservation* (<http://www.Calflora.org/>) (Calflora 2000). These data sources were chosen based on their representation of large plant collections at significant local and regional herbaria as well as their collaborative efforts with several state and federal government agencies, botanical gardens, and universities. Listings for bryophytes found in Napa County are not included here; however Rae (2006) has identified 125 moss taxa within the county including several potentially rare taxa.

The preliminary Napa County plant checklist was further augmented with personal observations and unpublished data collected by members of the California Native Plant Society's Napa County Chapter (Jake Ruygt, personal communication). These observations mainly confirmed the presence of taxa reported from Napa County but for which no voucher specimen exists. Local landowners were also helpful, and although their extensive knowledge of the plants on their lands added no new species to the final checklist, they did provide valuable information on several undocumented populations of rare taxa. Once collected, all data records were compiled into a provisional list.

Each taxonomic record (species, sub-species, or variety) was subjected to a rigorous verification process to eliminate synonymous records and other nomenclatural and taxonomic errors, while incorporating taxonomic revisions. Taxonomic authority is

based on the *Jepson Manual: Higher Plants of California* (Hickman 1993) in addition to more recent publications for specific taxa. The verification process began by screening each record using *Fred Hrusa's CROSSWALK* (<http://ucjeps.berkeley.edu/xw.html>) (Hrusa 2005) database for plant taxonomic synonymy. In the few cases where records were unavailable on CROSSWALK, records were verified using the *California Native Plant Society's Inventory of Rare and Endangered Plants of California* (Tibor 2001), and the *Jepson Manual* (Hickman 1993). Taxonomic records that did not survive the screening, or records listed as genera only, were compiled on a list of rejected taxa while the verified records were put on a list for accepted taxa. The list of accepted taxa was divided based on their native or exotic status using information from the original data sources and then catalogued on separate lists.

Finally, unconfirmed taxa, originally listed on Calflora and “presumed” to exist in Napa County based on published botanical literature but for which no voucher specimens exist, were removed from the resulting native and exotic lists unless they could be confirmed by one of the other data sources used during the compilation procedure. The taxa removed were compiled in two additional lists for unconfirmed native taxa and unconfirmed exotic taxa. After completing this filtering process, all accepted and confirmed native plant records were compiled in a final checklist of the native flora of Napa County.

It should be noted here that this checklist is a snapshot in time, and is designed to be a foundation for continuing research. Despite verifying each record on the checklist,

inherent issues may affect the accuracy of the final checklist. These include variation in taxonomic methods, changing species distributions and evolution, and sampling issues. The primary concern is that taxonomic assessments and legal conservation statuses according to current regulations are constantly in flux. Although every attempt was made to eliminate all synonymous records, some of the records listed on the original data sources are identified at different taxonomic levels. For example Calflora lists both *Brodiaea californica* Lindl. and *Brodiaea californica* Lindl. var. *leptandra* (Green) Hoover. In some cases, potentially synonymous records for taxa listed at the species and at intraspecific levels were included unless the voucher specimen or record for the species could be identified as a duplicate subspecies or variety. This method corresponds to the protocols used on The Jepson Online Interchange SMASH database and Calflora, making numerical comparisons between the floras of Napa County and the State of California possible. Furthermore, inclusion of these taxa on the checklist did not significantly alter the results regarding overall diversity measures.

The second concern involves natural biological processes that may affect the list. Evolution is a continuous process and new species are sometimes forming while others are extirpated. It should also be noted that geographic distributions of current plant taxa are dynamic and thus recruits from unlisted taxa may enter Napa County and add to its diversity. Despite these issues, this checklist is designed to be updated as new data become available.

Finally, sampling methods can affect the outcome of any study, particularly in those with large areas of interest. Every locale in Napa County has not been sampled adequately, and unlisted taxa will likely be discovered as sampling efforts increase. Nevertheless, this checklist will provide a valuable tool for cataloguing changes that may occur based on future sampling efforts.

Rarity Classification

Given the great interest in conservation and planning issues within Napa County, as well as studies on rarity in general, the checklist of the native flora was annotated with information on rarity. Using data from the California Department of Fish and Game Natural Diversity Database (CNDDDB) element ranking system (CNDDDB 2007), the conservation status rank for each ranked taxon was recorded on the native plant checklist. All records with a conservation status rank were compiled on a separate list for rare taxa for further analysis.

Results

Floristic Summary

After completing the verification and confirmation procedures, the final checklist for the flora of Napa County includes 1716 native and exotic taxa which represent 116 families. The final native plant checklist for Napa County (Appendix A) includes 1418 taxa representing 82.6% of Napa's total vascular flora and 105 different families (Table 2.1).

Table 2.1- Floristic summary of Napa County.

Vascular Plants of Napa County	Number of Taxa (Percent of Napa Flora)	Number of Families (Percent of Napa Flora)
Napa County Flora	1716	116
Native Taxa	1418 (82.6%)	105 (90.5%)
Rare Native Taxa	126 (8.8% native flora, 7.3% total flora)	35 (33.3% native flora, 30.1% total flora)
Exotic Taxa	298 (17.4%)	51 (44.0%)

The ten families containing the largest proportion of the native vascular flora are shown in Table 2.2. These ten families include 730 taxa representing over 51% of Napa's native flora (42% of the total flora).

Table 2.2- Ten most represented families on the Napa County, CA native plant checklist.

Family	Number of Native Taxa in Napa	Percent of Total Napa Flora	Percent of Native Napa Flora
Asteraceae	197	11.5	13.9
Fabaceae	88	5.1	6.2
Poaceae	85	5.0	6.0
Liliaceae	70	4.1	4.9
Scrophulariaceae	65	3.8	4.6
Brassicaceae	50	2.9	3.5
Polemoniaceae	46	2.7	3.2
Apiaceae	45	2.6	3.2
Cyperaceae	42	2.5	3.0
Polygonaceae	42	2.5	3.0

In addition to the 1418 native plant taxa found in Napa County, there are also 298 exotic taxa comprising 17.4% of the county's total vascular flora (Appendix B). These exotic taxa are members of 51 different families including 11 unique families to the checklist for exotic plants. The most represented families on the exotic plant checklist

are provided in Table 2.3. These families include 222 taxa representing close to 75% of Napa's exotic flora (12% of the total county flora).

Table 2.3- Eleven most represented families on the Napa County, CA exotic plant checklist.

Family	Number of Exotic Taxa in Napa	Percent of Total Napa Flora	Percent of Exotic Napa Flora
Poaceae	67	3.9	22.5
Asteraceae	46	2.7	15.4
Fabaceae	30	1.8	10.1
Brassicaceae	18	1.1	6.0
Caryophyllaceae	11	0.6	3.7
Geraniaceae	10	0.6	3.4
Chenopodiaceae	10	0.6	3.4
Scrophulariaceae	10	0.6	3.4
Solanaceae	8	0.5	2.7
Apiaceae	6	0.4	2.0
Polygoneaceae	6	0.4	2.0

Rarity Summary

In sum, 126 native taxa representing 8.8% of the native flora of Napa County (7.3% of Napa's total flora) are listed as rare or threatened to some degree by the CNDDDB element ranking system (Table 2.1, Appendix A) (CNDDDB 2007). These special status taxa are from 35 different families. The 11 most represented are listed in Table 2.4 below. These eleven families contain 88 special status taxa representing over 70% of all special status plants in Napa County.

Table 2.4- Eleven families most represented by special status taxa on the Napa County, CA native plant checklist.

Family	Number of Special Status Taxa	Percent of Total Napa Flora	Percent of Native Napa Flora	Percent of Special Status Napa Flora
Asteraceae	18	1.0	1.2	14.2
Polemoniaceae	12	0.7	0.8	9.6
Fabaceae	11	0.6	0.8	8.8
Brassicaceae	9	0.5	0.6	7.2
Liliaceae	9	0.5	0.6	7.2
Scrophulariaceae	7	0.4	0.5	5.6
Apiaceae	6	0.4	0.4	4.8
Polygonaceae	5	0.3	0.4	4.0
Lamiaceae	4	0.2	0.3	3.2
Linaceae	4	0.2	0.3	3.2
Rhamnaceae	4	0.2	0.3	3.2

Floristic Comparisons

The flora of Napa County as defined by the checklist presented here, is distinctive when compared to other lists and databases that include taxa from Napa County, floras from other counties, and the flora of California as a whole (Table 2.5). This checklist includes more taxa than Majors (1963 manuscript) and the Jepson Herbaria SMASCH list for Napa County (Jepson Flora Project 2005). The increase in number of taxa is due to newly discovered taxa, more recent collections, and taxonomic revisions and updates. The larger number of taxa listed on Calflora (2000) is mainly due to the inclusion of 594 taxa presumed to exist in Napa County. As these taxa were excluded from the final checklist presented here, the Calflora list was expected to be larger.

Table 2.5- Comparison of the total number of listed plant taxa among available data sources for Napa County.

Source	Total Number of Taxa Listed for Napa County
Majors (Manuscript 1963)	1253
The Jepson Herbaria SMASCH List (2007)	1044
Calflora (2005)	2238
Present Study	1716

Regarding the State of California's total flora, the Jepson Flora Project indicates that the state contains 8427 unique taxa (Moe, personal communication). Hickman (1993) indicates that taxa from 173 families exist in California although extensive taxonomic revisions at the family level will soon alter this number (Moe, personal communication). Of the taxa currently known to occur in California, 7204 or 85.5% are native, while 1223 exotic species comprise 14.5% of California's flora (Jepson Flora Project 2005; Table 2.6). The two most speciose families in the state are Asteraceae and Poaceae (Hickman 1993). As of April 2007, the CNDDDB lists 2142 special status plant taxa representing 29.7% of the native flora (25.4% of California's total flora) (Table 2.6) (Bittman, personal communication, CNDDDB 2007).

Table 2.6- Floristic summary of the State of California (CNDDDB 2007, Jepson Flora Project 2005)

Vascular Plants of California	Number of Taxa (Percent of Flora)
California Flora (173 families)	8427
Native Taxa	7204 (85.5%)
Rare Taxa	2142 (29.7% native flora, 25.4% total flora)
Exotic Taxa	298 (14.5%)

According to results presented here, Napa County's 116 families equate to 67.1% of California's total familial diversity. The two largest families in California (Asteraceae & Poaceae) are also the largest families in Napa County. The 1716 taxa present in Napa County represents 20.3% of California's total floristic diversity while Napa's 1418 native taxa represent 19.6 % of California's native flora. Interestingly, both the floras of California and Napa County contain comparable percentages of native and exotic taxa. The 126 special status plant taxa from Napa County comprise 5.8% of all special status plants in California as well as 1.7% of the native California flora (1.5% of California's total flora) (CNDDDB 2007).

When results from Napa County are compared to those from other counties in California with a current flora or checklist, the significance of Napa's flora is further highlighted (Table 2.7). First, comparisons were made to the flora of Sonoma County as it is adjacent to Napa County and shares many of Napa's geographical features. Although Sonoma County is more than twice the size of Napa County (United States Census Bureau 2000) it has only 206 more taxa and 46 more rare taxa (Best et al. 2006). These numbers for Sonoma County equate to only a 12% increase in the number taxa and a 37% increase in number of rare taxa with a 123% increase in overall surface area.

Table 2.7- Floristic comparison of Napa County to California and other selected California counties. *Indicates adjacent county, **indicates county with most similar overall surface area. Sources for total number of taxa listed with respective county. All county area measures from U.S Census Bureau (2000). Rare taxa numbers from CNPS (2005).

County Name (Source)	County Area (km ²) (% Total CA Area)	Number of Taxa (% of California Flora)	Number of Rare Taxa (% of California Rare Flora)	Number of Taxa/ km ²	Number of Rare Taxa/ km ²
<u>Napa</u> (Present study)	2052 (0.5%)	1716 (20.3%)	126 (5.8%)	0.836	0.061
<u>Marin</u> ** (Howell et al. 2007)	2145 (0.5%)	1679 (19.9%)	117 (5.4%)	0.782	0.054
<u>Orange</u> (Roberts 1998)	2455 (0.6%)	1193 (14.2%)	88 (4.1%)	0.485	0.035
<u>Butte</u> (Oswald & Ahart 1994)	4343 (1.1%)	2023 (24.0%)	105 (4.9%)	0.465	0.024
<u>Sonoma</u> * (Best 1996)	4579 (1.1%)	1921 (22.8%)	171 (7.9%)	0.419	0.037
<u>Plumas</u> (Clifton 2003 Manuscript)	6768 (1.7%)	2085 (24.7%)	121 (5.6%)	0.308	0.017
<u>San Luis Obispo</u> (Hoover 1970)	9365 (2.3%)	1583 (18.8%)	202 (9.4%)	0.169	0.021
<u>Monterey</u> (Matthews 1997)	9767 (2.4%)	2055 (24.4%)	182 (8.4%)	0.210	0.018
<u>Mendocino</u> (Smith & Wheeler 1992)	10,044 (2.5%)	2746 (32.6%)	165 (7.7%)	0.273	0.016
<u>San Diego</u> (Rebman & Simpson 2006)	11,722 (2.9%)	2314 (27.5%)	256 (11.9%)	0.197	0.021
<u>Kern</u> (Moe et al. 1995)	21,137 (5.2%)	1875 (22.2%)	161 (7.5%)	0.088	0.007
<u>California</u> (Moe personal communication)	403,932	8427	2142	0.021	0.005

Results from the Napa checklist were then compared to Roberts' (1998) plant checklist for Orange County as well as to Howell et al.'s (2007) for Marin County. Although Marin and Orange Counties are approximately the same size (km²) as Napa County, the floristic results are remarkably different (United States Census Bureau 2000). Despite being almost 100 km² larger than Napa, Marin County has 37 fewer taxa and 9 fewer rare taxa than Napa. Orange County contains 522 fewer taxa and 37 less rare taxa while being over 400 km² larger than Napa (Table 2.7).

In order to adjust for the differences between the size of California, each of its counties, and Napa County, the number of taxa per km² in Napa was compared to the same measures for California and other counties with available data (Hoover 1970; Smith & Wheeler 1992; Oswald & Ahart 1994; Moe & Twisselmann 1995; Roberts 1998; Clifton 2003 manuscript; Best et al. 2006; Rebman & Simpson 2006; Howell et al. 2007). As shown in Table 2.7, Napa has more taxa per km² and more rare taxa per km² than California and every county in the comparison.

Discussion

Plant Diversity In Napa County

The checklist presented here highlights plant *and* rare plant diversity that contributes significantly to the California Floristic Province's status as a diversity hotspot at global and sub-national (statewide) scales. Napa County's high plant richness level is greatly influenced by heterogeneous geographical characteristics similar to those that

account for high floristic diversity in other nearby counties (Howell et al. 2007; Best 1996; Ornduff 2003) as well as other regions characterized by Mediterranean climates (Dallman 1998). Furthermore, results indicate that Napa County is highly representative of the California Floristic Province in terms of familial and species diversity despite its relatively small area. At the same time, results highlight several unique floristic features of Napa County making it an ideal setting for continuing research and conservation efforts.

Threats to Plant Diversity

Unfortunately, Napa County's high population density and growth rate (Parisi 2003) emphasize the area's urgent need for conservation programs. Napa also contains high numbers of exotic taxa, many of which have adverse effects on the native flora and on rare taxa in particular (Parisi 2003). This combination of floristic diversity and eminent threat further highlights the need for immediate attention. Fortunately, local landowners, conservation groups, & government agencies show strong support for conservation programs, and may help expedite the long processes plant conservation often requires.

Recommendations

For its overall size, Napa County contains one of the highest concentrations of plant taxa as well as special status taxa within the California Floristic Province. Further analysis of these rare taxa should therefore be a priority for conservation planners and policy makers.

Continuing research will help to insure the survival of numerous taxa and maintain high levels of botanical diversity in a small geographic area and at a minimal cost.

For these efforts to be most successful, future research should focus on three key topics. First, as previously suggested by Majors (1963), development of modern taxonomic keys specifically for Napa County's flora is highly encouraged. An up to date key will allow researchers and planners to identify plant taxa quickly and accurately and help to prevent erroneous records from entering data sets.

Second, continuing field and herbaria research to confirm the presence of several suspected plant taxa in Napa County is necessary. More complete sampling in Napa County is needed to confirm distributions and to collect voucher specimens for unconfirmed taxa. Furthermore, complete and updated identification of herbarium records for taxa that are listed at both specific and intra-specific levels will eliminate potentially synonymous records.

Finally, studies are needed in Napa County to better determine distributions of all plant taxa in Napa County. Special emphasis should be given to rare or unique taxa and populations, invasive taxa, and locations with high richness levels in order to reveal localized areas most in need of attention. Identification of rare plant richness hotspots within Napa County may be particularly helpful at focusing conservation efforts. The checklist presented here provides a first step toward better understanding of the significance of Napa County's unique flora as well as the flora of California as a whole.

CHAPTER 3-
PROPOSED CRITERIA FOR CATEGORIZING
LOCALLY RARE PLANT TAXA

Introduction

Rarity Scales and Conservation

The Earth's diverse biological communities are extremely valuable to humankind for numerous reasons (Edwards & Abivardi 1998; Allen-Diaz 2000; Zedler et al. 2001). Unfortunately, they are disappearing at an alarming rate due to numerous factors (Pimm et al. 1995; Duncan & Young 2000; Gaston 2003). Rare species are a significant component to many ecosystems and are more susceptible to extinction than relatively common species (Pimm et al. 1988; Pimm et al. 1995; Gaston 2003). This increased susceptibility is often due to increased sensitivity to factors such as habitat fragmentation, increased inbreeding depression, and environmental stochasticity (Terborgh 1974; Goodman 1987; Lessica & Allendorf 1995; Lennartsson 2002; Henle et al. 2004). Rarity is a scale dependent attribute (White 1999; Gaston 2003) and is based directly or indirectly on spatial distributions (White 2004). It is therefore important to classify rare taxa by analyzing their spatial distributions at a variety of scales (Gärdenfors 2001).

Unlike globally rare taxa which are rare everywhere on the planet, *locally rare* taxa are those that are rare or uncommon within a local geographical boundary while

more common outside of that boundary. Locally rare taxa are frequently composed of peripheral populations with significant ecological value (Safriel et al. 1994; Lessica & Allendorf 1995; Leppig & White 2006). They commonly harbor unique genetic and morphological lineages that provide the opportunity for divergence along novel evolutionary paths through the processes of natural selection (Safriel et al. 1994; Lessica & Allendorf 1995; Gaston 2003). Locally rare plants maintenance of genetic variation increases the probability of overall species survival (Lessica & Allendorf 1992; Lessica & Allendorf 1995) and locales with peripheral populations often act as refugia during catastrophic range contractions (Safriel et al. 1994; Channell & Lomilino 2000). Peripheral plant populations also provide the flexibility required for responding to stochastic environmental events such as global climate change (Safriel et al. 1994; Smith et al. 2001). Furthermore, locally rare plants may have intrinsic cultural, economic, and aesthetic value (Ehrlich & Ehrlich 1992; Daily et al. 2000; Gaston 2003). Unfortunately, locally rare taxa are susceptible to the same threats that affect all ecological communities.

Although there is current legislation in the United States to protect globally, nationally, and sub-nationally rare plants (CESA 1970; ESA 1973), most conservation efforts and development decisions happen at local and regional levels (Reid 1998; Brooks et al. 2006; Leppig & White 2006). In addition to the rare taxa identified by global, national, and state agencies, locally rare taxa are important for the preservation of species diversity, and therefore require effective and recognizable conservation status. Although Magney (2004) applied Natural Heritage Network's state element ranking system to a

county jurisdiction, there are no specific local rarity ranks or criteria presently in use to categorize taxa at the county level. Unfortunately due to this vagueness, current regulations that are applicable to locally rare taxa are often not effectively used in conservation planning and prioritizing (Leppig & White 2006).

The purpose of this proposal is to outline a set of protocols for applying conservation ranks at local levels specifically for locally rare taxa. The aim is to address the current gap in the criteria for categorizing our biodiversity at local levels. After briefly summarizing current conservation status criteria, a proposed set of criteria which are applicable to locally rare taxa and compatible with currently established state, national, and global conservation criteria, is introduced. The goal of this proposal is to create a standardized protocol that may be used to categorize locally rare plant taxa at the local and regional jurisdictional level.

Background

First, the rarity criteria of two leading international conservation organizations are reviewed. The Natural Heritage Network (NatureServe) and the International Union for the Conservation of Nature and Natural Resources (IUCN) have developed and implemented criteria for categorizing rare species by using combinations of quantitative and qualitative measures. Criteria are based on number of occurrences, population sizes, range sizes (using various methods), threat levels, and/or extinction probabilities (IUCN 2001; NatureServe 2006). Each of these is discussed but here the main focus is on quantitative area of occupancy (a range size) measures.

NatureServe makes use of the Natural Diversity Database Element Ranking System and uses a series of criteria to classify taxa into several “element ranks” based on their level of rarity (Table 3.1; NatureServe 2006). There are a number of other categories used by NatureServe, however, in this proposal the discussion is limited to the “Conservation Status Ranks” and do not address other categories such as the “Variant Ranks” or “Qualifiers” (see NatureServe 2006 for descriptions). Additionally, each of the conservation status ranks listed in Table 3.1 is applicable at multiple jurisdictional scales that are identified by a prefix rank letter designating assessment level (Table 3.2; NatureServe 2006). Thus, a taxon that is critically imperiled at all current levels of assessment is labeled, for example, G1N1S1, representing critical imperilment at global, national and state levels. Note that both the National and the State levels for assessment are based on the areas of specific jurisdictions or political boundaries. Thus, the area under consideration varies significantly.

Table 3.1-Conservation status ranks and criteria used by NatureServe and CNDDDB.

Conservation Status Rank	Criteria
X = Presumed extinct	Not located despite extensive searches and virtually no likelihood of rediscovery
H = Possibly extinct	Missing; known from only historical occurrences but still some hope of rediscovery
1 = Critically imperiled	<6 viable element occurrences or <1000 individuals or <2000 acres
2 = Imperiled	6-20 viable element occurrences or 1000-3000 individuals or 2000-10,000 acres
3 = Vulnerable to threat or extinction	21-80 viable element occurrences or 3000-10,000 individuals or 10,000-50,000 acres
4 = Apparently secure	Uncommon but not rare, some cause for long-term concern due to declines or other factors
5 = Demonstrably widespread, abundant, & secure	Common; widespread & abundant

Table 3.2- Assessment level ranks (NatureServe 2006).

Assessment Rank	Scale of Condition
G = Global assessment	Overall condition
N = National assessment	Condition in a particular country
S = State assessment	Condition in a particular state
T = Intraspecific rank	Condition of a subspecies or variety

In addition to the information in Tables 3.1 and 3.2, a “T” rank can be included for intra-specific taxa by simply applying the same element ranking system to a particular subspecies or variety. Finally, a threat code can be added to a conservation status rank as a decimal extension (Table 3.3; CNDDDB 2007).

Table 3.3- Threat code extensions (CNDDDB 2007).

Extension	Threat Level
.1	Very threatened
.2	Threatened
.3	No current threats known

Benefits of NatureServe's methods include specific numerical criteria for identifying rarity by range size, population size, and number of element occurrences as well as their applicability to multiple geographic scales and taxonomic levels. They do not provide usable area of occupancy criteria for local scales, however, which has become the preferred method in which geographical data is quantified, summarized, and used for comparative analyses (Williams et al. 1996; White 1999; Draper et al. 2003). Furthermore, in some instances, all criteria used by NatureServe cannot be logically and effectively applied at local level jurisdictions due to size constraints. In short, because of variation in jurisdictional areas, they should not be used as the basis for setting local rarity criteria.

The IUCN uses its own system to categorize rare taxa on its RED List (Table 3.4) which includes criteria based on area of occupancy measures. Each category is defined by specific criteria for population decline, geographic range size, overall population size, and probability of extinction (IUCN 2001). Area of occupancy and overall population size criteria for the three "threat categories" (Critically Endangered, Endangered, and Vulnerable) are outlined in more detail below (Table 3.5).

Table 3.4- IUCN RED List categories (IUCN 2001) *indicates threat categories.

Category	Criteria
Extinct (EX)	No reasonable doubt that the last individual has died
Extinct in the Wild (EW)	Known only to survive in cultivation, captivity, or naturalized populations outside of past range
Critically Endangered (CR)*	Facing extremely high risk of extinction
Endangered (EN)*	Facing a very high risk of extinction
Vulnerable (VU)*	Facing a high risk of extinction
Near Threatened (NT)	Does not qualify for a threatened category but is likely to in the near future
Least Concern (LC)	Widespread and abundant
Data Deficient (DD)	Inadequate information to assess risk of extinction based on distribution and/or population status
Not Evaluated (NE)	Not evaluated against the IUCN criteria

Table 3.5- Area of occupancy and population number criteria for IUCN threat categories (IUCN 2001).

Category	Criteria
Critically Endangered	<10km ² <50 mature individuals
Endangered	<500km ² <250 mature individuals
Vulnerable	<2000km ² <1000 mature individuals

It should be noted that many of the IUCN's criteria for individual categories, including those for area of occupancy and population numbers, do not stand alone. For example, a taxon is considered "critically endangered" based on area of occupancy criteria only if it has an area of occupancy less than 10km² *and* it meets two other criteria such as extreme fragmentation and population decline. Many of the criteria have optional temporal components to them such as probability of extinction within a given time frame, but are not considered here.

IUCN Red List criteria such as those for population decline or probability of extinction can be valuable tools for assigning conservation priority to threatened taxa. However, these are measures that are dynamic over time and distinguishing taxa that meet these criteria can require long term analysis (ten years or more) in situations where available time and data are limited. Their criteria for area of occupancy provide more concrete thresholds that are readily measurable at any given time and are compatible with current tools for geographic analysis. Therefore, the proposed ranking system presented here focuses specifically on these measures.

Proposal

Local Rarity Ranking System

Proposed here is the establishment of a new local assessment level (L-Rank) for categorizing locally rare taxa by applying a modified version of the NatureServe element ranking system in local jurisdictions or geographic regions. Thus, a taxon that meets “critically imperiled” criteria at all geographical assessment levels would now be labeled G1N1S1L1, representing critical imperilment at global, national, state, *and* local levels.

Furthermore, using methods similar to the IUCN system, the introduction of area of occupancy criteria for categorization and geographic analysis of locally rare taxa is also proposed. In addition to the original NatureServe criteria, under this proposal, a taxon would be considered locally rare if it met minimum area of occupancy levels using grids composed of 1km x 1km (1 km²) cells. While support is given to the IUCN’s area

of occupancy criteria for larger scales, the same numbers cannot be applied to local (county) assessment levels due to the fact that many local jurisdictions are relatively small and have an overall area of <2000km². Therefore, new area of occupancy criteria are created specifically for the local assessment level. In sum, the local rarity criteria for the proposed L-Rank system are a hybrid NatureServe's Element Ranking System and the IUCN Red List system with newly defined area of occupancy criteria.

Table 3.6 highlights the proposed system for categorizing locally rare taxa. The main additions to the NatureServe and the IUCN systems included in this system are: 1) scaling of the assessment level to correspond with local rarity, the L-rank, and 2) inclusion of area of occupancy criteria for L-ranks 1, 2, and 3.

Table 3.6- Criteria for proposed L-Rank system based on number of element occurrences, number of individuals, and area of occupancy using 1km raster grid cells.

L-Rank	Criteria
X = Presumed extinct	Not located despite extensive searches and virtually no likelihood of rediscovery
H = Possibly extinct	Missing; known from only historical occurrences but still some hope of rediscovery
1 = Critically imperiled	<6 viable element occurrences or <1000 individuals
2 = Imperiled	<10 km ² or <10, 1km x 1km cells 6-20 viable element occurrences or 1000-3000 individuals
3 = Vulnerable to threat or extinction	<50 km ² or <50, 1km x 1km cells 21-80 viable element occurrences or 3000-10,000 individuals
4 = Apparently secure	<250 km ² or <250, 1km x 1km cells Uncommon but not rare, some cause for long-term concern due to declines or other factors
5 = Demonstrably widespread, abundant, & secure	Common; widespread & abundant

Discussion

Application

The proposed L-Rank system is specifically designed to be compatible with broad scale conservation programs, specifically NatureServe's Element Ranking System and the IUCN Red List. Therefore, it is emphasized that using the proposed system will not significantly affect overall assessment outcomes at the state, national, or global level. Rather, the proposed local rarity criteria will provide a useful tool for comparative analysis at the local level and simply augment the current systems in use.

Locally rare taxa are an important component of the Earth's biodiversity and deserve our attention. Without an explicit set of criteria for identifying and classifying these significant organisms, they cannot be effectively protected. The proposed inclusion of a local rarity L-Rank into a modified combination of two accredited ranking systems is designed to enhance existing methods by empowering local governments and organizations by providing them with a standardized system for local level analysis.

CHAPTER 4-
ANALYSIS OF RARE PLANT DISTRIBUTIONS IN
NAPA COUNTY, CALIFORNIA

Introduction

Background

Biological hotspots are locations or regions that have high concentrations of particular organisms or biological characteristics as compared to other locations and are generally threatened to some degree (Myers 1988; Myers 1990; Kati et al. 2004). At global, national, and sub-national (statewide) scales, the California Floristic Province is repeatedly identified as a biodiversity hotspot based on a variety of criteria ranging from overall diversity to rarity weighted richness (Dobson 1997; Abbitt et al. 2000; Myers et al. 2000; Brooks et al. 2006). Since the majority of conservation decisions are made at local geographical scales (e.g. statewide and below; Mace et al. 2000), numerous authors emphasize the need for fine scale analysis of globally prioritized regions (Médail & Quézel 1997; Poiani et al. 2000; Harris et al. 2005; Brooks et al 2006).

Napa County is located in the heart of the California Floristic Province, and is frequently highlighted as a biological diversity hotspot for numerous taxonomic groups ranging from birds to plants (Chaplin et al. 2000; Parisi 2003). Unfortunately, Napa County ranks high for human population densities in California, a factor directly

contributing to habitat degradation, the leading cause of species loss in the state (Parisi 2003). As well as being an overall diversity hotspot, Napa County is occupied by a disproportionately large number of rare taxa from a variety of different taxonomic groups (Parisi 2003; Chapter 2) which are particularly susceptible to the effects of habitat fragmentation and degradation, and are more likely to become extinct (Pimm et al. 1988; Pimm et al. 1995; Gaston 2003). This combination of rich biological diversity and imminent threats highlights Napa County's need for better data and analysis of the distribution of plant biodiversity in order to aid in systematic conservation efforts.

Rare Plant Conservation

Plant taxa continually dominate rare and endangered species lists and therefore should be prioritized for conservation efforts (Ellstrand & Elam 1993). The variety of valuable ecological and evolutionary roles performed by rare plants further emphasizes their significance (Ellis & Midgley 1996; Kaye 1999; Lyons & Schwartz 2001; Smith et al. 2005). Research shows that Napa County has a uniquely diverse flora including many rare and endemic taxa represented by small populations (Stebbins & Major 1965; Chapter 2). Fortunately, current legislation in California and in the United States can provide conservation status to many of the rare and unique taxa found in Napa County as well as their habitats, once they are listed (ESA 1973; CEQA 2005). This is a long process however and many significant taxa currently remain unlisted.

Local Rarity

The ecological and evolutionary significance of locally rare plant taxa, which are often distributed as edge of range or peripheral populations, has been well discussed in the literature (Smith et al. 2001; Leppig & White 2006; Chapter 3). Nevertheless, unlike globally, nationally, and sub-nationally (state) rare taxa, locally rare taxa are not well integrated into conservation planning efforts largely due to a lack of distribution data and a standardized system for summarizing their status. Once locally rare taxa are systematically classified however, they still may not be eligible for the same protection provided to other rare and significant taxa by current environmental regulations (ESA 1973, CEQA 2005). Local level assessment and regulation is required to protect these plants.

Hotspot Conservation

Conservation planning efforts involving identification of biological hotspots are extremely valuable endeavors in the attempt to conserve rare and/or endangered species (Conservation International 1997; Reid 1998; Abbitt et al. 2000; Myers et al. 2000). Eminent biologist and conservationist Edward O. Wilson stated that the hotspot concept is “the most important contribution to conservation biology of the last century” (Myers 2003). Several significant organizations including the World Bank and Conservation International support the hotspot concept and collectively have allocated over \$750 million to hotspot research efforts, the largest amount ever assigned to a single

conservation strategy (Myers 2003). Additionally, many of these programs have had profound effects on the cancellation, relocation, and mitigation of environmentally harmful practices, even in the absence of specific conservation legislation” (Brooks et al. 2006), and consequently hotspot research, identification, and conservation, is one of our most valuable tools for protecting the world’s species.

Current research specifically focused on two global biodiversity hotspots, the Mediterranean Basin (Médail & Quézel 1997; 1999), and the Atlantic Coastal Forests of Brazil (Harris et al. 2005), revealed that species richness is not evenly distributed at local scales within global hotspots. As conservation efforts happen at global and local jurisdictional levels, multiple spatial scale efforts including local scales are the most effective conservation strategies (Poiani et al. 2000; Gärdenfors 2001; Venevsky & Venevskiaia 2005).

Furthermore, *richness* hotspots are not always congruent with hotspots of *rarity*, which are locations particularly rich with rare taxa (Prendergast et al. 1993). As there is widespread interest in rare and endangered species, this research focuses specifically on rarity hotspots. Additionally, understanding the habitats in which populations of rare plant species occur is a prerequisite to developing a conservation strategy (Wiser 1998). Wu and Smiens (2000) concluded that there is an urgent need of rare plant habitat assessment for multiple scale conservation planning efforts.

The primary goal of this study is to compile and map some of the fine scale attributes of the California Floristic Province by analyzing distributions of rare plants

from multiple assessment levels in a local subset (Napa County) of this global biodiversity hotspot. The second goal is to identify associations between distributions of rare plant richness and habitats to determine if rarity hotspots are consistently distributed within specific vegetation or land-use types. Finally, this study examines the extent to which rare plant richness corresponds with protected areas to identify specific locations that should be prioritized for conservation efforts.

Methods

Globally/Sub-nationally Rare Plants

In Napa County there are 126 taxa distributed in Napa County that are considered rare at the global and/or sub-national (state) level (G-Rank ≤ 3 and/or S-Rank ≤ 3).

These taxa were analyzed collectively throughout the duration of the study. Of these G- and S-ranked taxa, distribution data for 55 taxa were available as geographic information system (GIS) compatible data layers on the California Department of Fish and Game Natural Diversity Database (hereafter CNDDDB) RareFind 3.0.5 computer application (CNDDDB 2006; also see Bittman 2001) and imported into ArcGIS 9.1 (ESRI 2005).

Individual raster layers for each taxon were created in ArcMap (ESRI 2005) using 5 m x 5 m (5 m²) grid cells. Using Arc GIS Spatial Analyst 9.1 (ESRI 2005), each data layer was reclassified using “presence” as the reclass field to create new layers with a binary code indicating presence or absence. To generate a GIS layer illustrating richness hotspots of G- and S-ranked taxa, presence data from the individual taxa layers were

added using the raster calculator in Spatial Analyst. Grid cells that contained more than one G- or S-ranked plant taxa were identified as global and/or sub-national (hereafter global) plant rarity richness hotspots and ranked according to number of ranked taxa per cell.

To make fitting comparisons with larger scaled data sets to be used for the identification of locally rare taxa, another map of globally rare plant richness hotspots was created using 1 km x 1 km (1 km²) grid cells. To accomplish this, 1 km² distribution layers for each taxon were created using the “blockmax” function. This function takes the maximum value of the cells within a given block and assigns the value to the entire block. Again, cells were reclassified to indicate presence or absence and added together using the raster calculator to identify global rarity richness hotspots (cells with two or more ranked taxa) at the 1 km² scale.

Although the “blockmax” procedure artificially inflates the apparent area of distributions, it was a necessary procedure in that it insured that small distributions (≈ 0.5 km²) were not eliminated as the scale of the analysis increased. Therefore, it is important to note that for any grid cell in any of the maps, “presence” indicates only that a particular taxon is present *somewhere* in that cell and provides no data on total number of individuals, overall distribution densities, or geometric areas. Effects of this procedure are presented and discussed in the results and conclusions sections.

Locally Rare Plants

Data from the CalJep spatial distribution database (Viers et al. 2006) and CaprICE Plant Species Distribution Map Browser (available at <http://cain.ice.ucdavis.edu>) were used to visually identify several hundred unranked plant taxa in Napa County as “candidates” for local rarity status (LH, 1, 2, and 3) based on area of occupancy criteria outlined in Chapter 3. Allan Hollander of the University of California- Davis and the Information Center for the Environment provided 1 km² raster layers for the California distribution of each candidate taxon. All layers were imported into Arc GIS 9.1 for analysis.

Each data layer was reclassified with Spatial Analyst using “value” as the reclass field to create new layers with a binary code indicating presence or absence. A mask layer for Napa County was then created by reclassifying the State of California layer to create a new layer with a binary code distinguishing Napa from the rest of the state. The statewide distribution layers for individual taxa were multiplied with the Napa County mask layer to create new layers showing plant distributions within Napa County (cells with a product of one). The resulting layers for individual taxa were then queried and those with distributions meeting the minimum area of occupancy criteria for locally rarity (<250 km²) were classified further. Remaining taxa were assigned appropriate L-Ranks based on area of occupancy criteria outlined in Chapter 3. Once classified, individual distribution layers for plant taxa with L-ranks 1, 2 or 3 were added using the raster

calculator to identify hotspots of locally rare plant richness in Napa County, defined here as any 1 km² grid cell that contains more than one L-ranked plant taxon.

Distributional Correlations

Initially 1 km² distributions of all ranked plants (G, S, & L) were combined to be viewed collectively and to determine how many cells in Napa are occupied by rare taxa of any assessment level. The distributions of global rarity hotspots were then compared with local rarity hotspots to determine the extent to which they correspond. Analysis was carried out using the 1 km² grid cell layers, as it was the smallest scale for which there were available data for G-, S-, *and* L-ranked taxa. Cells identified as globally *and* locally rare plant richness hotspots were identified as multi-scale hotspots of plant rarity, defined here as any cell occupied by two or more L-ranked plant taxa in addition to two or more G- or S-ranked plant taxa.

Two background data layers were imported to identify correlation between rare plant distributions (rarity cells), habitat types (Thorne et al. 2004), and protected lands in Napa County (NCLT 2006). Habitat data was imported and rasterized using 25 m² grid cells and again using 1 km² grid cells. Hotspot layers were added to coded habitat layers using the raster calculator to produce new layers with cell values indicating which habitat type occupies each hotspot cell.

To test for associations between the presence of rare plants (as well as hotspots) and habitat types, the geographic extent of each habitat as a proportion of Napa County, was plotted against the proportion of rarity cells (and hotspot cells) in Napa County

corresponding with each habitat type. In the absence of ecological and/or historical influences, rare taxa should be randomly distributed with respect to habitat types. Theoretically, this null hypothesis predicts a line with a slope of one. Habitat types falling outside of the 95% prediction intervals constructed around this line do not correspond with expected proportions of rarity associated with those habitat types (Garland & Ives 2000). Those habitats falling above the upper interval exceeded expected proportions of rarity and/or hotspot cells; those falling below the lower interval have smaller proportions than expected. The prediction is that rare plant distributions are associated with habitat types due to the fact that a large number of rare plants are associated habitat types (CNPS 2005).

The distributions of protected lands were compared with the distributions of rare plant richness to identify potential conservation gaps in Napa County. A “protected lands” distribution data layer was provided by Lena Septimo of the Napa County Land Trust and imported into the data set. Conservation gaps were visually identified in ArcMap 9.1.

Results

G- and S-ranked Plant Distributions

Figure 4.1 illustrates G- and S-ranked plant richness in Napa County based on occupancy of 25 m² cells. In total over 12 million cells, or 14.8% of the total number of cells in Napa (approximately 82 million), contain at least one G- or S-ranked plant taxa.

Furthermore, 2,879,391 cells, or 3.5% of Napa, are occupied by more than one G- or S-ranked plant (categories 1, 2, or 3) and are considered global rarity hotspots according to the definition used here. Of these hotspot cells, 474,181, or 0.5% of Napa, are the richest, and are occupied by at least five G- or S-ranked plants. The very richest 31,172 cells each contain eight ranked taxa per cell.

Figure 4.2 shows G- and S-ranked plant richness patterns based on occupancy of 1 km² grid cells. In total, 775 cells, or 37.7% of the total number of 1 km² cells in Napa (2052) have at least one G- or S-ranked plant taxa present in them. Additionally, 321 grid cells, or 15.6% of Napa, are occupied by more than one G- or S-ranked plant (categories 1, 2, or 3) and are considered global rarity hotspots. Of these hotspot cells, 50 (2.4% of Napa) are the richest, and are occupied by at least five G-and/or S-ranked plants. The richest cell is occupied by nine G- and/or S-ranked plant taxa.

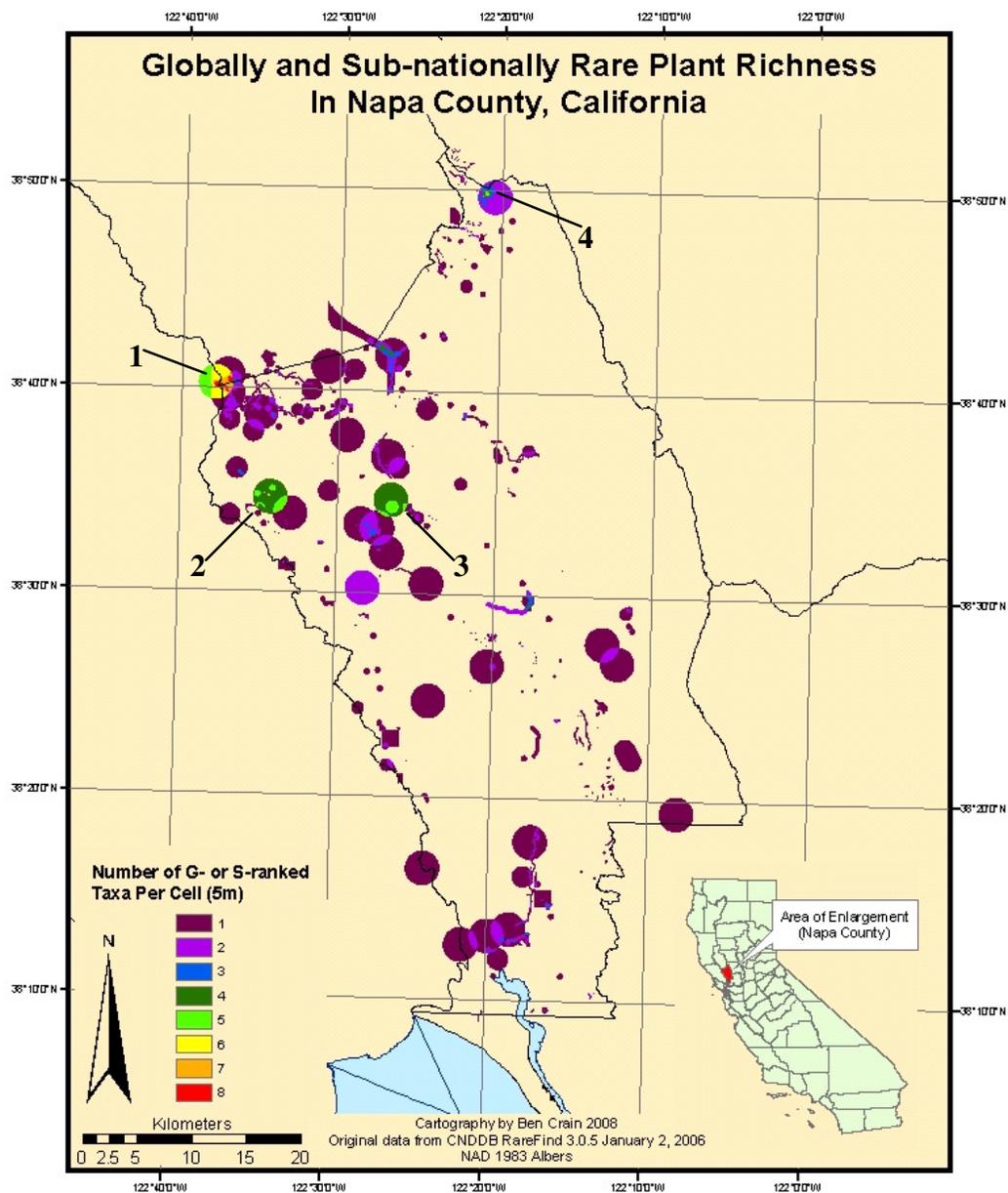


Figure 4.1- G- and S-ranked plant richness patterns in Napa County based on occupancy of 25 m² grid cells. Numbered lines indicate individual hotspots: 1) Mt. St. Helena area, 2) Southeast Calistoga area, 3) Angwin area, 4) Knoxville area.

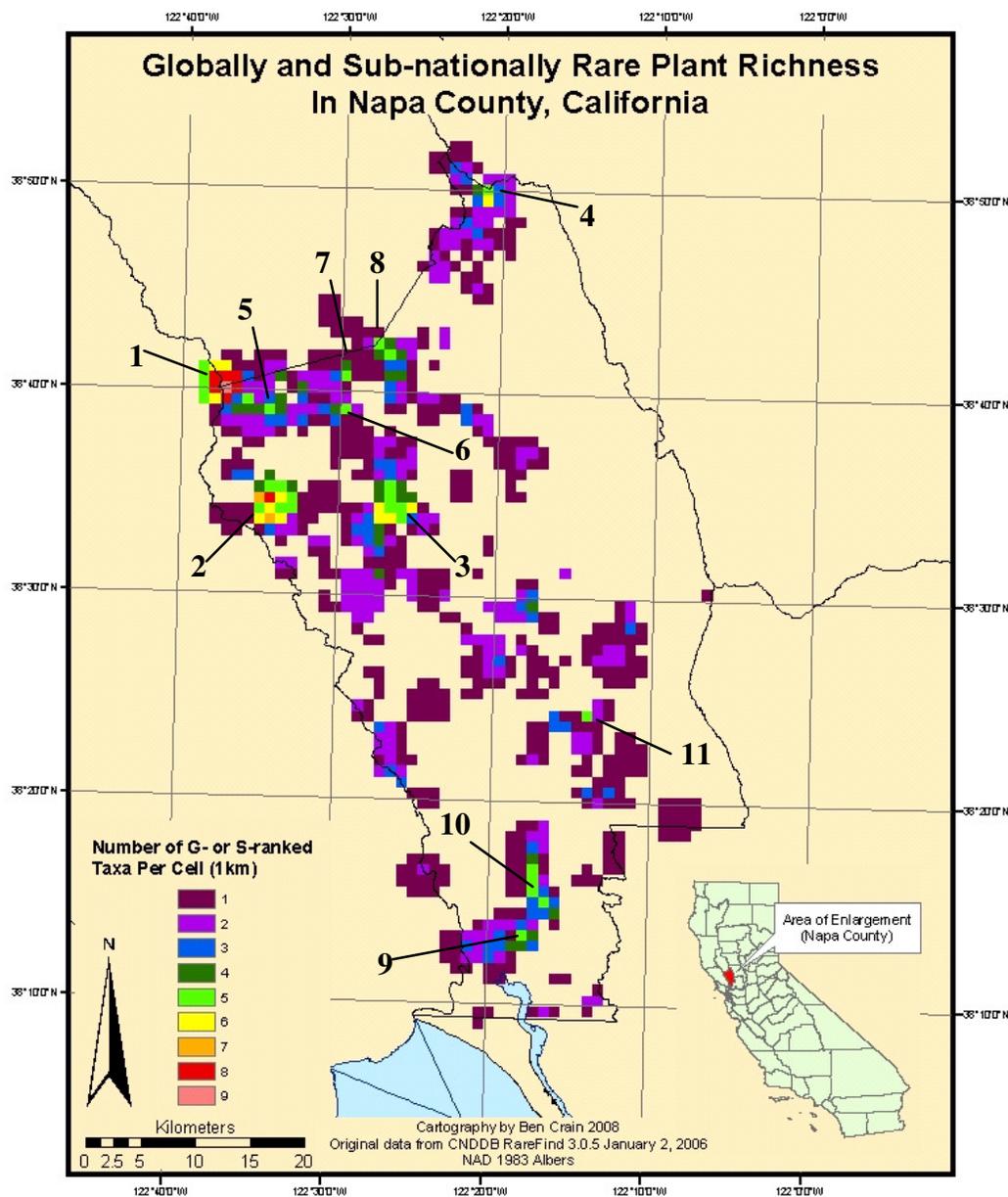


Figure 4.2- G- and S-ranked plant richness patterns in Napa County based on occupancy of 1 km² grid cells. Numbered lines indicate individual hotspots: 1) Mt. St Helena area, 2) Southeast Calistoga area, 3) Angwin area, 4) Knoxville area, 5) Table Rock area, 6) Aetna Springs area, 7) James Creek area, 8) Butts Canyon area, 9) Cuttings Wharf area, 10) Rocktram/NapaRiver area, 11) Foss Valley/Atlas Peak area.

At the 25 m² scale four areas are highlighted as the richest hotspots in Napa County (5 or more G- or S-ranked taxa/cell). At the 1 km² scale, an additional seven are also shown. The richest hotspots in Napa County using 25 m² cells include approximately 15 km² of the Mount St. Helena/Table Mountain area and 13 km² in the area southeast of the City of St. Helena in the north end of Napa Valley (Figure 4.1). Two other areas highlighted in Napa County include approximately 9 km² in the Angwin area near Howell Mountain and 2 km² in the Knoxville area near the Yolo County Border (Figure 4.1). The seven other areas among the richest hotspots in Napa County are only apparent at the 1 km² spatial scale (Figure 4.2). These include: 1 km² near Table Rock, 1 km² southwest of Aetna Springs, 1 km² near James Creek northeast of Aetna Springs, 2 km² along Butts Canyon, 1 km² near Cutting Wharf near the Napa River, 4 km² along the Napa River near Rocktram, and 1 km² near Foss Valley east of Atlas Peak Road.

L-ranked Plants and Distributions

Results indicate that in addition to the 126 G- and/or S-ranked taxa (categories 1, 2, and 3), 89 additional taxa from 33 families meet the area of occupancy criteria for local rarity ranks H, 1, 2, and 3 in Napa County, CA (Appendix A). This equates to a total of 6.3% of Napa's 1418 native plant taxa (Chapter 2). Of these L-ranked plants, 56 taxa (3.9% of Napa's natives) from 27 families meet the criteria for L-ranks 1, 2, and 3 (the threat categories). The remaining 33 taxa representing 18 families, including six families not represented by an L1, 2, or 3 plant, met the criteria for the LH rank according to

available distribution data. Figure 4.3 shows examples of the distributions of three L-ranked plants (categories 1, 2, and 3) using 1 km² grid cells.

Figure 4.4 illustrates L-ranked plant richness in Napa County using 1 km² cells. In total, 644 cells, or 31.3% of the total number of cells in Napa (2052) have at least one L-ranked plant taxa present in them. Furthermore, 331 grid cells, or 16.1% of Napa, are occupied by more than one L-ranked plant (categories 1, 2, or 3) and are considered local rarity hotspots. Of these hotspot cells, 167, or 8.1% of Napa, have at least ten L-ranked plants within them. Additionally, 84 cells, or 4.1% of Napa, have at least 20 L-ranked plants within them and are considered the richest local rarity hotspots in the county. The very richest cell in the county is occupied by 26 L-ranked plant taxa.

In Napa County, 14 areas are highlighted as the richest hotspots of locally rare plants (20 or more L-ranked taxa/cell) (Figure 4.4). The richest hotspot is located in the Mount St. Helena/Sugarloaf Mountain/Table Mountain area and covers 21 km². The second richest location is in the northern edge of the Sugarloaf Ridge State Park area near Bald Mountain and Heath Canyon and covers only 2 km².

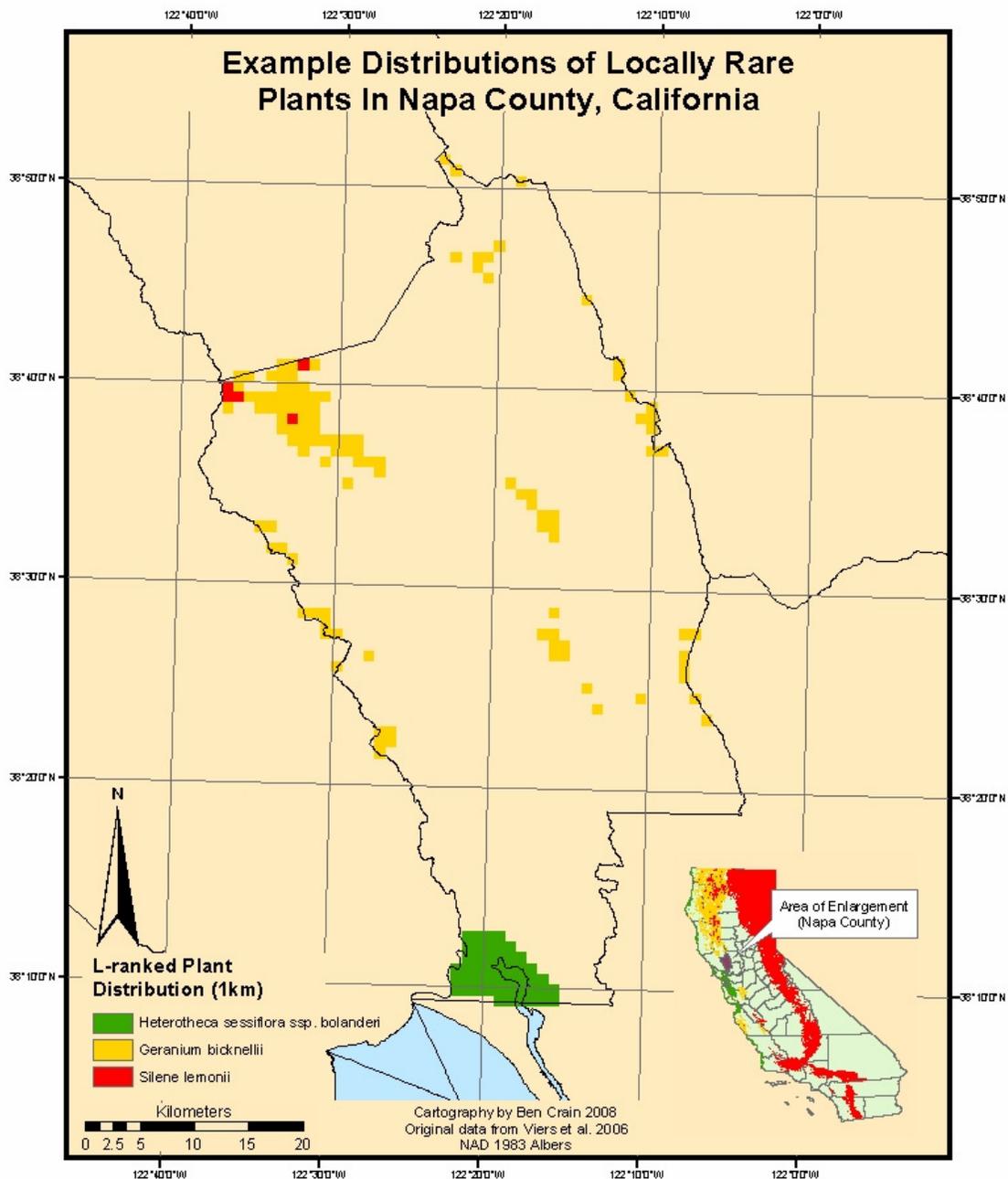


Figure 4.3- Examples of the distributions of three L-ranked plants (categories 1, 2, and 3) in Napa County based on occupancy of 1 km² grid cells.

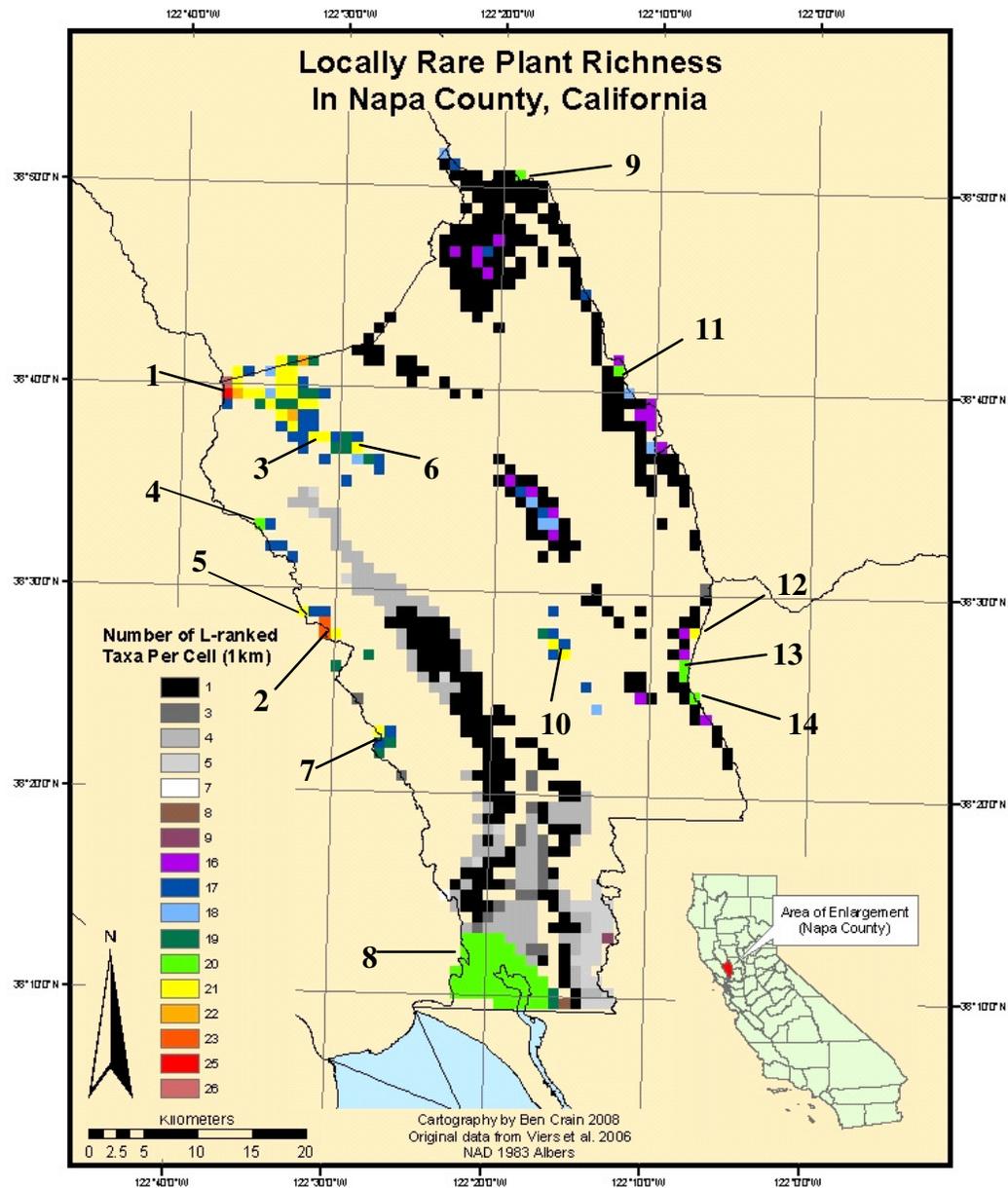


Figure 4.4- L-ranked plant richness patterns in Napa County based on occupancy of 1 km² grid cells. Numbered lines indicate individual hotspots: 1) Mt. St. Helena/Sugarloaf Mt. area, 2) Sugarloaf Ridge/Bald Mt. area, 3) Rattlesnake Ridge area, 4) Diamond Mt. area, 5) Sulfur Canyon area, 6) Three Peaks area, 7) Mt. Veeder area, 8) South Napa River/adjacent sloughs area, 9) Long Canyon area, 10) Atlas Peak area, 11) Blue Ridge area, 12) North of Bull Canyon area, 13) Blue Ridge Rd area, 14) Mix Canyon Rd. area..

The remaining 12 L-ranked plant richness hotspots include: 2 km² in the Rattlesnake Ridge area, 1 km² south of Calistoga in the Diamond Mountain area, 1 km² south of Sulfur Canyon, 1 km² in the Three Peaks area, 1 km² in the Mount Veeder area, 46 km² along the southern end of the Napa River and the adjacent sloughs and islands, 1 km² in the northern Long Canyon area near the Yolo/Napa border, 2 km² in the Atlas Peak area, 1 km² along the Blue Ridge near Green Canyon, 1 km² north of Bull Canyon near the Napa/Solano border, 2 km² near the Blue Ridge Road near the Napa/Solano border, and 1 km² in the Vaca Mountains near Mix Canyon Road.

Correspondence Between Rarity Assessment Level Ranks

Figure 4.5 shows the combined 1 km² distributions of G-, S-, and L-ranked plant taxa in Napa County. A total of 1191 grid cells are occupied by at least one ranked plant taxon. This number of cells equates to 58.0% of Napa County's total surface area.

Figure 4.6 shows a comparison of the distributions of global rarity richness hotspots with distributions of local rarity richness hotspots. When combined, 568 1 km² grid cells (27.7% of Napa's total) meet the definition of rare plant richness hotspots for at least one assessment level rank. Of these, 84 grid cells (4.1% of Napa's total) are considered both global *and* local rarity hotspots, and thus, are identified as multi-scale hotspots of rare plant richness.

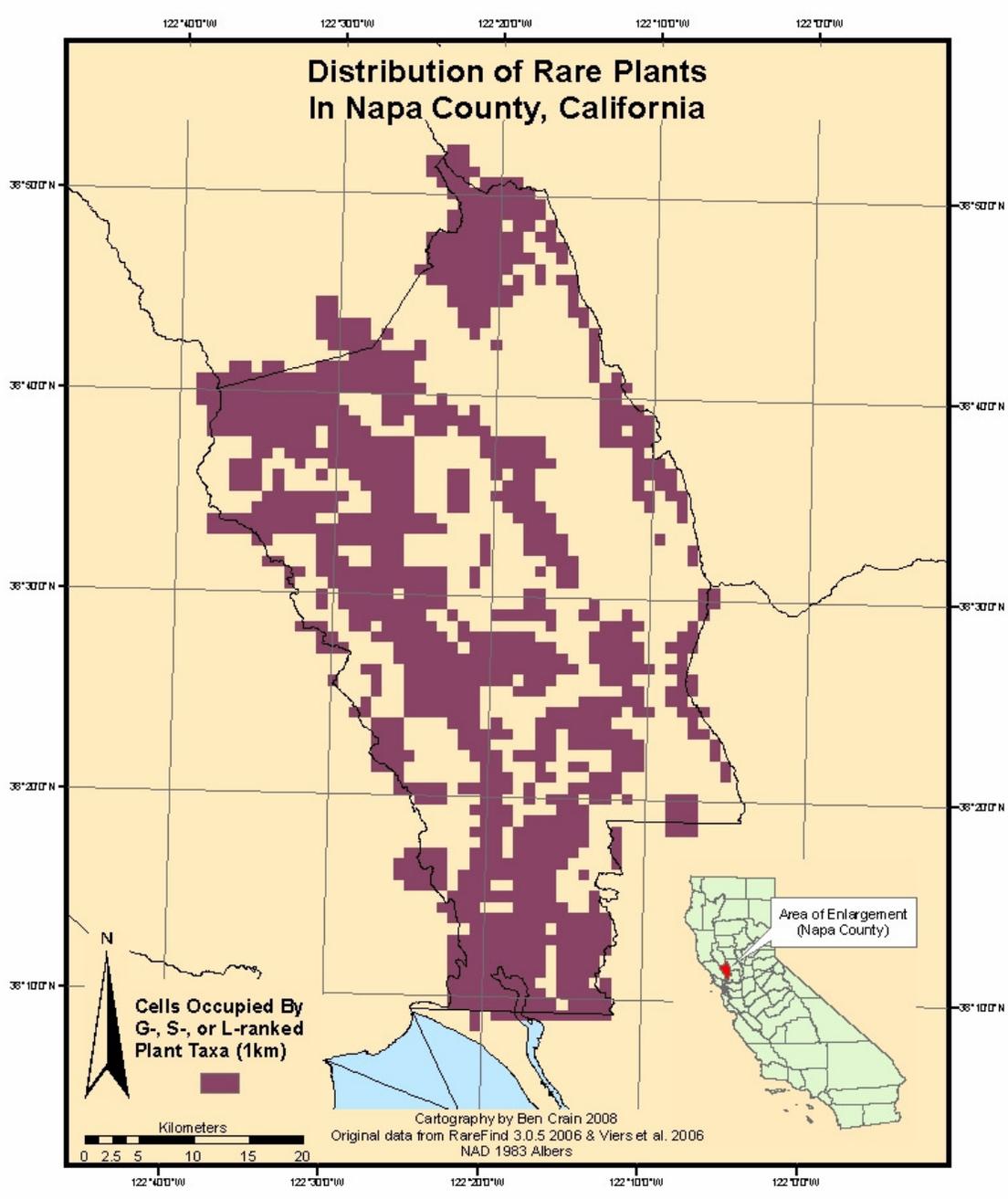


Figure 4.5- 1 km² cells in Napa County occupied by rare plant taxa.

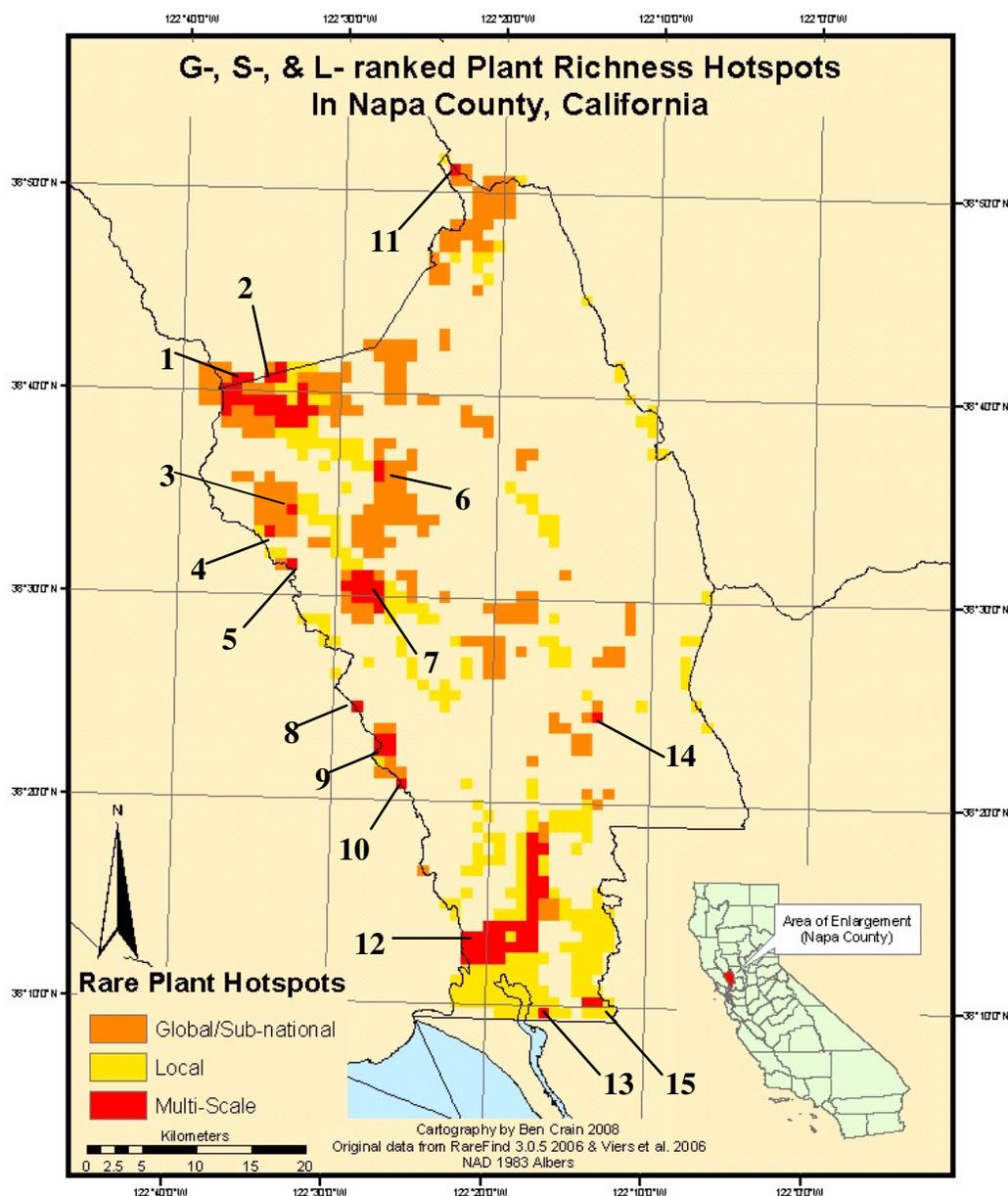


Figure 4.6- Global, local, and multi-scale rare plant richness hotspots in Napa County, CA.

Numbers indicate individual hotspots: 1) Mt. St. Helena/Sugarloaf Mt. area, 2) Three Peaks area, 3) Calistoga area, 4) Diamond Mt area, 5) N. of Spring Mt. Rd., 6) Angwin area, 7) St. Helena area, 8) Sonoma border near Dry Creek Rd., 9) Mt. Veeder area, 10) Devils Canyon area, 11) Yolo border near Berryessa Rd., 12) S. Napa River area, 13) American Canyon area, 14) Milliken Canyon area, 15) American Canyon Creek area.

In total there are 15 locations in Napa County that are classified as multi-scale hotspots of rare plant richness. They include: 22 km² in the Mount St. Helena/Sugarloaf Mountain area, 3 km² in the Three Peaks area, 1 km² east of Calistoga in the north end of Napa Valley, 1 km² south of Calistoga in the Diamond Mountain area, 1 km² north of Spring Mountain Road near the Napa/Sonoma border, 2 km² north of Angwin, 10 km² in the St. Helena area, 1 km² near Dry Creek Road on the Napa/Sonoma border, 4 km² in the Mount Veeder area, 1 km² near Devil's Canyon near the Napa/Sonoma border, 1 km² on the Napa/Yolo border north of Berryessa Road, 33 km² along the south end of the Napa River and its adjacent sloughs, 1 km² along the American Canyon Creek near the Napa/Solano border, 1 km² near Milliken Canyon, and 2km² in the American Canyon area. The richest G-, S-, and L-ranked plant hotspots only correspond in the Mount St. Helena area (Figures 4.2, 4.4, & 4.6).

Rarity and Habitat

Distributions of of the 59 habitat types found in Napa County (Thorne et al. 2004) are highly variable. The most common habitat in Napa County is not surprisingly, Agriculture. This is followed by the Blue Oak Alliance, the California Annual Grasslands Alliance, the Chamise Alliance, and Water. The most uncommon types are the California Juniper Alliance, the Sugar Pine-Canyon Oak NFD Association, the Sparse Bush Lupine/Annual Grasses/Rock Outcrop NFD Alliance, the *Lotus scoparius* Alliance (post-burn), and the Coyote Brush-California Sagebrush- (Lupine spp.) NFD Super Alliance (Table 4.1).

Table 4.1- Proportion of Napa County occupied by various habitats; Proportion of G- or S-ranked plant distribution cells (rarity cells) occupied by various habitats; Percent of global rarity hotspot cells occupied by various habitats (25 m² cells).

Vegetation/Land Use Type (Thorne et al. 2004)	% of Napa County	% of Rarity Cells	% of Hotspot Cells
1-White Leaf Manzanita– Leather Oak - (Chamise– Ceanothus spp.) Xeric Serpentine NFD Super Alliance	1.59	1.58	2.42
2-Leather Oak- White Leaf Manzanita- Chamise Xeric Serpentine NFD Super Alliance	5.35	3.88	4.46
3-Serpentine Grasslands NFD Super Alliance	0.42	0.39	0.31
4-Leather Oak– California Bay- Rhamnus spp. Mesic Serpentine NFD Alliance	0.87	0.65	0.23
5-California Annual Grasslands Alliance	7.78	4.48	5.33
6-McNab Cypress Alliance	0.47	0.34	0.41
7-Chamise Alliance	6.12	3.62	2.98
8-California Bay- Leather Oak- (Rhamnus spp.) Mesic Serpentine NFD Super Alliance	1.42	1.94	2.23
9-Urban or Built-up	5.25	9.19	16.44
10-Chamise– Wedgeleaf Ceanothus Alliance	1.40	0.29	0.43
11-Blue Oak Alliance	8.74	3.82	3.56
12-Water	5.71	2.86	2.10
13-Upland Annual Grasslands & Forbs Formation	2.41	3.91	3.31
14-Unkown	0.23	0.29	0.42
15-Interior Live Oak- Blue Oak - (Foothill Pine) NFD Association	3.58	0.88	1.08
16-Interior Live Oak Alliance	1.05	0.29	0.36
17-Scrub Interior Live Oak- Scrub Oak- (California Bay- Flowering Ash- Birch Leaf Mountain Mahogany– Toyon- California Buckeye) Mesic East County NFD Super Alliance	2.19	0.62	0.28
18-Black Oak Alliance	0.51	0.99	2.15
19-(Carex spp.– Juncus spp.- Wet Meadow Grasses) NFD Super Alliance	0.06	0.13	0.07
20-Mixed Oak Alliance	5.70	6.22	3.64
21-Perennial Bunchgrass Restoration Sites	0.05	0.05	0.13
22-Sparse California Juniper- Canyon Live Oak- California Bay- California Buckeye/Steep Rock Outcrop NFD Alliance	0.10	0.00	0.00
23-Vacant	0.35	0.64	0.78
24-Valley Oak Alliance	0.57	0.34	0.15
25-Mixed Willow Super Alliance	0.11	0.13	0.31
26-Valley Oak- (California Bay- Coast Live Oak- Walnut– Ash) Riparian Forest NFD Association	1.13	1.33	1.00

27-Sargent Cypress Alliance	0.41	0.14	0.26
28-Foothill Pine/Mesic Non-serpentine Chaparral NFD Association	0.19	0.08	0.04
29-Serpentine Barren	0.01	0.03	0.09
30-Rock Outcrop	0.34	0.47	0.35
31-Brewer Willow Alliance	0.05	0.09	0.13
32-Agriculture	12.78	14.75	15.21
33-Riverine, Lacustrine and Tidal Mudflats	0.08	0.16	0.00
34-Foothill Pine Alliance	0.37	0.84	1.06
35-Valley Oak– Fremont Cottonwood- (Coast Live Oak) Riparian Forest NFD Association	0.10	0.08	0.06
36-Mixed Manzanita- (Interior Live Oak-California Bay– Chamise) West County NFD Alliance	1.72	3.73	4.78
37-(Bulrush– Cattail) Fresh Water Marsh NFD Super Alliance	0.05	0.07	0.05
38-Canyon Live Oak Alliance	0.13	0.39	0.60
39-Knobcone Pine Alliance	1.17	2.81	2.68
40-White Alder (Mixed Willow- California Bay- Big Leaf Maple) Riparian Forest NFD Association	0.19	0.37	0.37
41-Douglas-fir- Ponderosa Pine Alliance	1.82	6.32	6.27
42-California Bay– Madrone- Coast Live Oak- (Black Oak Big- Leaf Maple) NFD Super Alliance	3.63	3.40	2.71
43-Douglas-fir Alliance	3.44	6.03	4.81
44-Coast Live Oak- Blue Oak- (Foothill Pine) NFD Association	5.23	5.76	1.60
45-Sugar Pine- Canyon Oak NFD Association	<0.01	0.01	0.00
46-Ponderosa Pine Alliance	0.03	0.12	0.30
47-Coast Live Oak Alliance	2.61	1.82	0.69
48-Coast Redwood– Douglas-fir/California Bay NFD Association	0.57	1.15	0.57
49-California Juniper Alliance	<0.01	0.00	0.00
50-Oregon White Oak Alliance	0.22	0.21	0.23
51-Tanbark Oak Alliance	0.05	0.13	0.39
52-Coast Redwood Alliance	0.06	0.07	0.00
53-Lotus scoparius Alliance (post-burn)	0.01	0.00	0.00
54-Eucalyptus Alliance	0.08	0.04	0.06
55-Sclerophyllous Shrubland Formation	0.65	0.24	0.10
56-Winter-Rain Sclerophyll Forests & Woodlands Formation	0.12	0.05	0.01
57-Coyote Brush– California Sagebrush- (Lupine spp.) NFD Super Alliance	0.01	0.00	0.00
58-Sparse Bush Lupine/Annual Grasses/Rock Outcrop NFD Alliance	<0.01	0.00	0.00
59-Saltgrass- Pickleweed NFD Super Alliance	0.71	1.79	2.02

In total, 54 habitat types correspond with G- and S-ranked plant distributions (rarity cells) at the 25 m² spatial scale of analysis (Table 4.1). Those corresponding most frequently are Agriculture, Urban or Built-up, the Douglas-fir- Ponderosa Pine Alliance, the Mixed Oak Alliance, and the Douglas-fir Alliance. Habitat types corresponding most infrequently are the California Juniper Alliance, the Sparse Bush Lupine/Annual Grasses/Rock Outcrop NFD Alliance, the *Lotus scoparius* Alliance (post-burn), Coyote Brush- California Sagebrush- (Lupine spp.) NFD Super Alliance, and the Sparse California Juniper- Canyon Live Oak- California Bay- California Buckeye/Steep Rock Outcrop NFD Alliance.

Of the 54 habitats associated with rarity cells in Napa County, 51 types correspond with global rarity richness hotspots at the 25 m² scale (Table 4.1). Habitats most commonly associated with these hotspots are Urban or Built-up, Agriculture, Douglas-fir- Ponderosa Pine Alliance, the California Annual Grasslands Alliance, and Douglas-fir Alliance. Those most infrequently corresponding are the Sugar Pine- Canyon Oak NFD Association, Coast Redwood Alliance, Riverine, Lacustrine, and Tidal Mudflats, Winter-Rain Sclerophyll Forests and Woodlands Formation, and Foothill Pine/Mesic Non-serpentine Chaparral NFD Association. The richest hotspots are distributed in 22 habitat types with Urban or Built-up, Rock Outcrop, Mixed Manzanita- (Interior Live Oak-California Bay- Chamise) West County NFD Alliance, Canyon Live Oak Alliance, Knobcone Pine Alliance, and Douglas-fir Alliance habitat types being associated with the very richest cells.

As previously mentioned, common habitats are more likely to be associated with rarity cells and hotspot cells due to chance resulting from area effects. Prediction interval tests accounting for area indicate that only the Douglas Fir- Ponderosa Pine Alliance (41) exceeded the 95% prediction interval of expected proportions of rarity cells occupied in Napa County. No habitat types fell below the 95% prediction interval (Figure 4.7). In terms of habitat types versus proportion of global rarity hotspot cells, four types exceeded expected proportions: Douglas Fir- Ponderosa Pine Alliance (41), Mixed Manzanita- (Interior Live Oak- California Bay- Chamise) West County NFD Alliance (36), Black Oak Alliance (18), and Urban or Built-up areas (9) (Figure 4.8).

In terms of the proportions of specific habitat types corresponding with rarity cells at the 5 m², the most consistent association is with the Sugar Pine– Canyon Oak NFD Association, which is occupied by a rare plant in 100% of its range in Napa County. Others with strong correspondence include the Ponderosa Pine Alliance, the Douglas-fir- Ponderosa Pine Alliance, the Canyon Live Oak Alliance, and the Tanbark Oak Alliance. The Sparse Bush Lupine/Annual Grasses/Rock Outcrop NFD Alliance, Coyote Brush- California Sagebrush- (Lupine spp.) NFD Super Alliance, *Lotus scoparius* Alliance (post-burn), California Juniper Alliance, and the Sparse California Juniper-Canyon Live Oak- California Bay-California Buckeye/Steep Rock Outcrop NFD Alliance have the lowest percentages of their range occupied (Table 4.2).

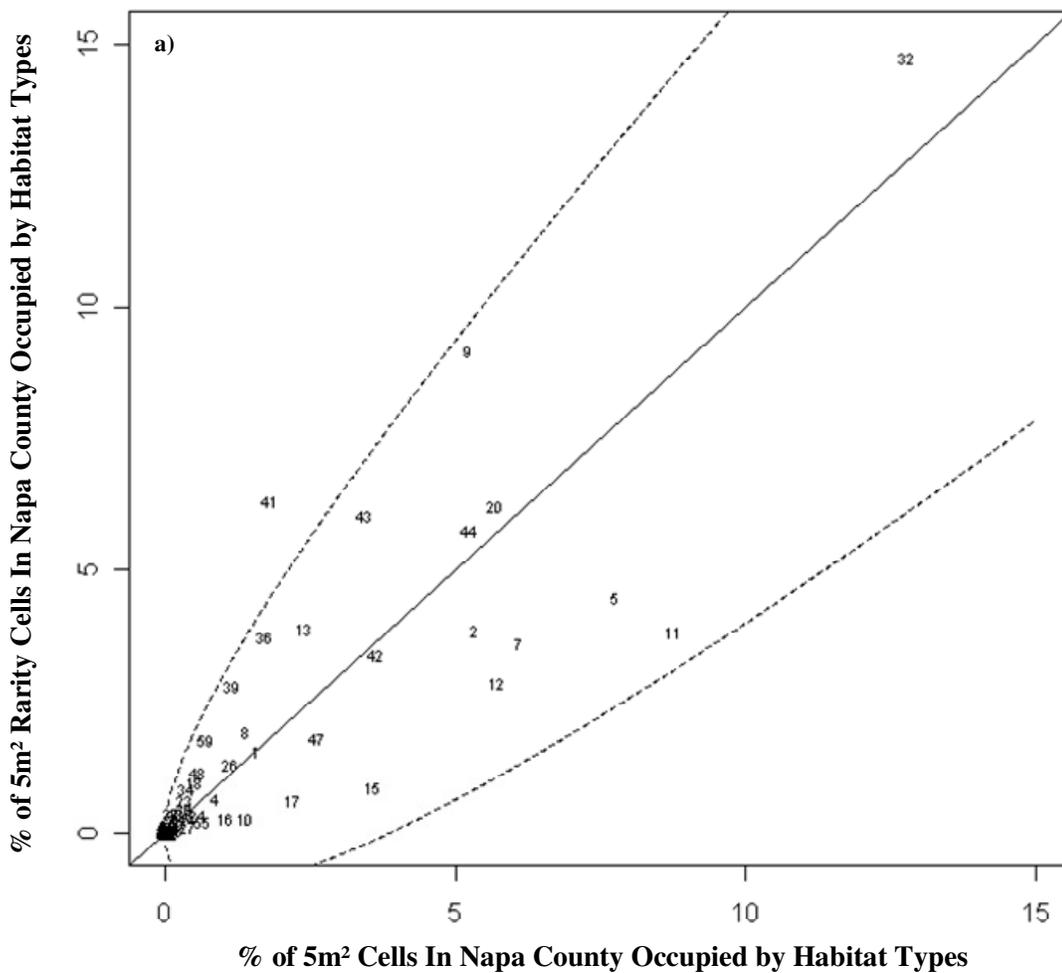


Figure 4.7- a) Habitat types and the proportion of Napa County they occupy versus the proportion of global rarity cells they occupy (25 m²). Point numbers indicate habitat types as outlined in Table 4.1. One to one ratio is shown as a solid line with 95% prediction intervals shown as dotted lines.

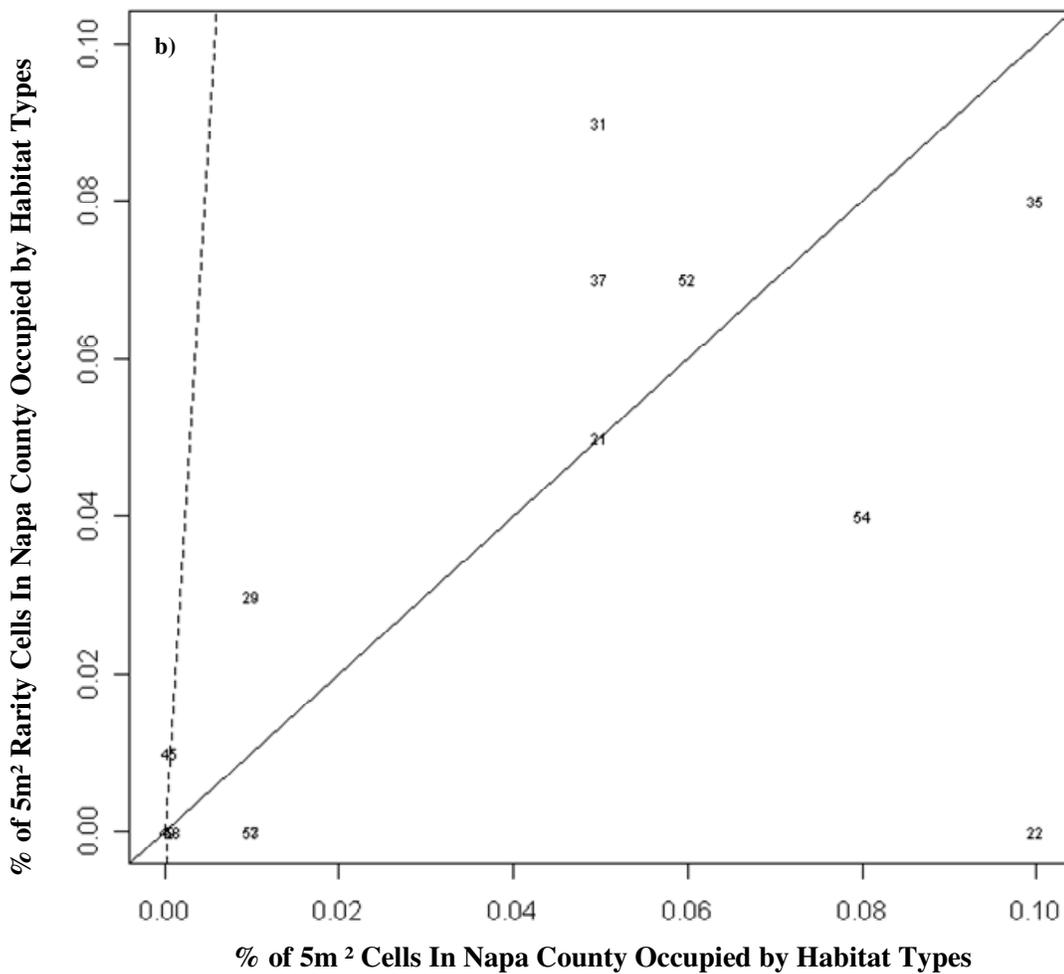


Figure 4.7- b) Subset of Figure 4.7a. Point numbers indicate habitat types as outlined in Table 4.1. One to one ratio is shown as a solid line with 95% prediction intervals shown as dotted lines.

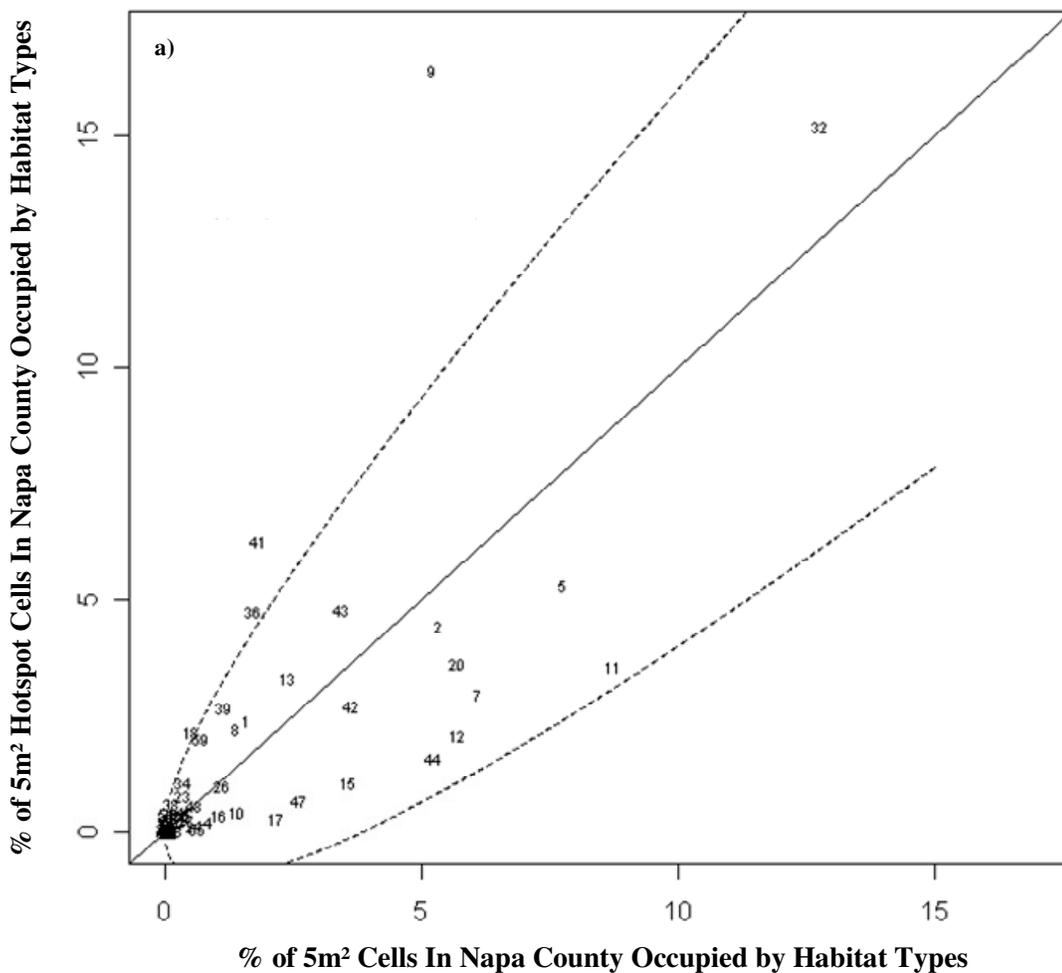


Figure 4.8- a) Habitat types and the proportion of Napa County they occupy versus the proportion of global rarity hotspot cells they occupy (25 m²). Point numbers indicate habitat types as outlined in Table 4.1. One to one ratio is shown as a solid line with 95% prediction intervals shown as dotted lines.

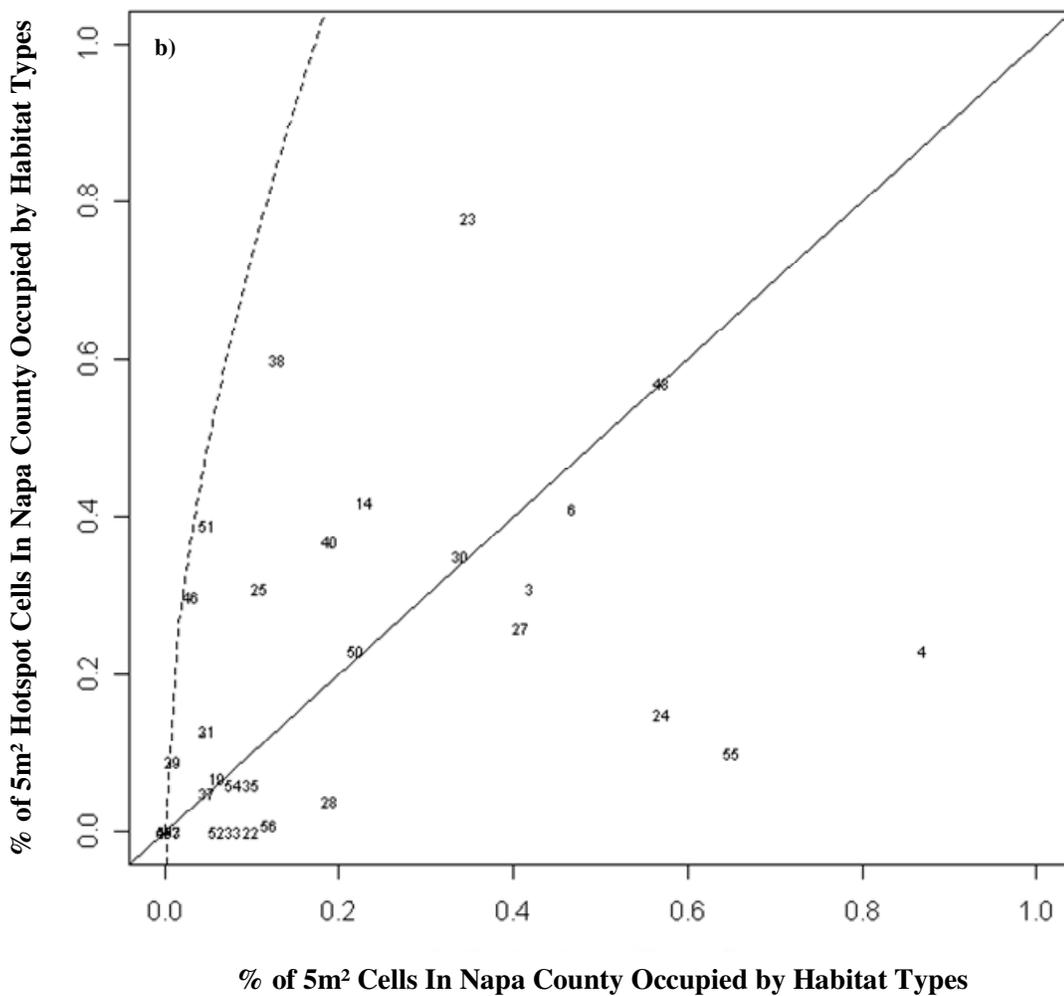


Figure 4.8- b) Subset of Figure 4.8a. Point numbers indicate habitat types as outlined in Table 4.1. One to one ratio is shown as a solid line with 95% prediction intervals shown as dotted lines.

Table 4.2- Proportion of habitat distributions corresponding with rarity cells (G- or S-ranks) and global rarity hotspot cells (25 m² cells).

Vegetation/Land Use Type (Thorne et al. 2004)	% of Vegetation/Land Use Type Occupied by a Rare Taxon (Occupied by a Hotspot)
1-White Leaf Manzanita– Leather Oak - (Chamise– Ceanothus spp.) Xeric Serpentine NFD Super Alliance	13.03 (4.75)
2-Leather Oak- White Leaf Manzanita- Chamise Xeric Serpentine NFD Super Alliance	9.51 (2.60)
3-Serpentine Grasslands NFD Super Alliance	12.14 (12.14)
4-Leather Oak– California Bay- Rhamnus spp. Mesic Serpentine NFD Alliance	9.71 (0.82)
5-California Annual Grasslands Alliance	7.55 (2.14)
6-McNab Cypress Alliance	9.34 (2.74)
7-Chamise Alliance	7.75 (1.52)
8-California Bay- Leather Oak- (Rhamnus spp.) Mesic Serpentine NFD Super Alliance	17.89 (4.89)
9-Urban or Built-up	22.99 (9.79)
10-Chamise– Wedgeleaf Ceanothus Alliance	2.73 (0.95)
11-Blue Oak Alliance	5.73 (1.27)
12-Water	6.58 (1.15)
13-Upland Annual Grasslands & Forbs Formation	21.31 (4.29)
14-Unkown	16.62 (5.67)
15-Interior Live Oak- Blue Oak - (Foothill Pine) NFD Association	3.23 (0.94)
16-Interior Live Oak Alliance	3.66 (1.07)
17-Scrub Interior Live Oak- Scrub Oak- (California Bay- Flowering Ash- Birch Leaf Mountain Mahogany– Toyon- California Buckeye) Mesic East County NFD Super Alliance	3.74 (0.40)
18-Black Oak Alliance	25.46 (13.18)
19-(Carex spp.– Juncus spp- Wet Meadow Grasses) NFD Super Alliance	30.39 (3.80)
20-Mixed Oak Alliance	14.32 (1.99)
21-Perennial Bunchgrass Restoration Sites	13.93 (7.78)
22-Sparse California Juniper- Canyon Live Oak- California Bay- California Buckeye/Steep Rock Outcrop NFD Alliance	0.00 (0.00)
23-Vacant	23.64 (6.88)
24-Valley Oak Alliance	7.80 (0.81)
25-Mixed Willow Super Alliance	16.38 (9.09)
26-Valley Oak- (California Bay- Coast Live Oak- Walnut– Ash) Riparian Forest NFD Association	15.36 (2.76)
27-Sargent Cypress Alliance	4.53 (2.03)

28-Foothill Pine/Mesic Non-serpentine Chaparral NFD Association	5.35 (0.73)
29-Serpentine Barren	32.47 (27.42)
30-Rock Outcrop	18.44 (3.27)
31-Brewer Willow Alliance	23.63 (8.35)
32-Agriculture	15.14 (4.75)
33-Riverine, Lacustrine and Tidal Mudflats	26.84 (0.11)
34-Foothill Pine Alliance	29.64 (8.95)
35-Valley Oak- Fremont Cottonwood- (Coast Live Oak) Riparian Forest NFD Association	9.58 (1.74)
36-Mixed Manzanita- (Interior Live Oak-California Bay- Chamise) West County NFD Alliance	28.43 (8.67)
37-(Bulrush- Cattail) Fresh Water Marsh NFD Super Alliance	18.23 (2.68)
38-Canyon Live Oak Alliance	38.78 (14.33)
39-Knobcone Pine Alliance	31.48 (7.14)
40-White Alder (Mixed Willow- California Bay- Big Leaf Maple) Riparian Forest NFD Association	25.23 (5.98)
41-Douglas-fir- Ponderosa Pine Alliance	45.46 (10.75)
42-California Bay- Madrone- Coast Live Oak- (Black Oak Big- Leaf Maple) NFD Super Alliance	12.30 (2.34)
43-Douglas-fir Alliance	23.01 (4.36)
44-Coast Live Oak- Blue Oak- (Foothill Pine) NFD Association	14.45 (0.96)
45-Sugar Pine- Canyon Oak NFD Association	100.00 (0.00)
46-Ponderosa Pine Alliance	47.97 (28.03)
47-Coast Live Oak Alliance	9.13 (0.82)
48-Coast Redwood- Douglas-fir/California Bay NFD Association	26.36 (4.75)
49-California Juniper Alliance	0.00 (0.00)
50-Oregon White Oak Alliance	12.33 (3.14)
51-Tanbark Oak Alliance	34.63 (24.75)
52-Coast Redwood Alliance	14.62 (0.00)
53-Lotus scoparius Alliance (post-burn)	0.00 (0.00)
54-Eucalyptus Alliance	6.90 (2.25)
55-Sclerophyllous Shrubland Formation	4.86 (0.49)
56-Winter-Rain Sclerophyll Forests & Woodlands Formation	4.87 (0.34)
57-Coyote Brush- California Sagebrush- (Lupine spp.) NFD Super Alliance	0.00 (0.00)
58-Sparse Bush Lupine/Annual Grasses/Rock Outcrop NFD Alliance	0.00 (0.00)
59-Saltgrass- Pickleweed NFD Super Alliance	33.24 (8.92)

In terms of the proportions of specific habitat types corresponding with global rarity hotspots at 5 m², the most consistent association is with the Ponderosa Pine Alliance, which is occupied by a richness hotspot in 28% of its range (Table 4.2). Others with strong hotspot correspondence include Serpentine Barrens, Tanbark Oak Alliance, Canyon Live Oak Alliance, and the Black Oak Alliance. Seven habitat types, including the Sugar Pine- Canyon Oak NFD Association, have no association with global rarity richness hotspots.

Habitat data summarized at the 1 km² scale revealed different patterns. Ten rare habitat types (distributed in <0.15% of Napa County) are excluded in the 1 km² summary leaving a total of 49 types. This exclusion results from the assignment of habitat types based on cell centroids. At the 1 km² scale, uncommon habitats are less likely to occupy cell centroids and are easily excluded in the summary. As rare habitat types are important for this analysis, 1 km² habitat data could not be used for further analysis.

Rarity and Protected Land

Napa County contains approximately 483 km² of protected lands divided among 20 different owner groups (NCLT 2006, Figure 4.9a). This equates to approximately 23% of the county's total surface area. Preliminary comparisons of rare plant hotspots to current protected lands indicate that many of them currently reside on protected lands at least to some degree. In many cases however, the richest areas do not correspond with protected lands and in other areas there is no correspondence at all (Figure 4.9).

Global rarity richness hotspots (5 m²) correspond best with protected lands in the northern portion of Napa County (Figure 4.9b). The Knoxville area hotspot, several smaller ones, and many individual taxon distributions correspond with protected land in this general location. The Mount St. Helena and Table Rock area hotspots correspond only to some degree. However, according to previous results the richest areas do not correspond in this area. Other significant areas that correspond to some degree are along the Napa River in the southern portion of the county, the Sage Canyon area, Atlas Peak area, Pope Creek area, and the Aetna Springs area. Two of the richest hotspots of global rarity, the area south of Calistoga and near Angwin, correspond with protected areas in almost none of their ranges (Figure 4.9b).

Local rarity hotspots correspond best with protected lands in the southern portion of the county (Figure 4.9c). The majority of the south Napa River and adjacent sloughs and islands hotspot corresponds with protected lands. Hotspots also corresponded relatively well along the eastern border of the county. Here, the Blue Ridge and the Bull Canyon hotspots both correspond with protected lands to some degree (Figure 4.9c).

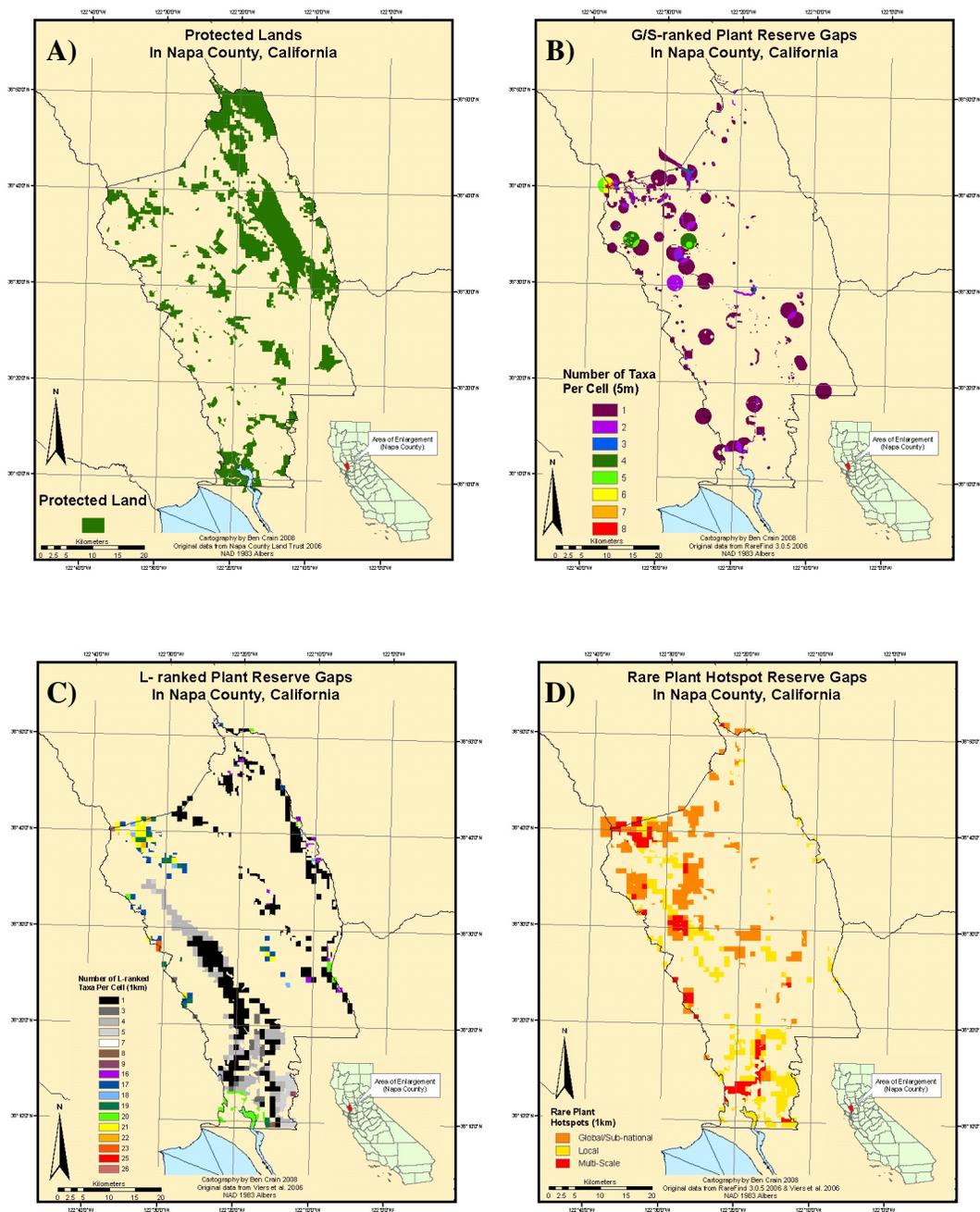


Figure 4.9- Protected lands compared to rarity richness hotspots. a) Protected lands in Napa County. b) Global rarity richness reserve gaps c) Local rarity richness reserve gaps d) Multi-scale hotspot reserve gaps.

Many of the hotspots in Napa do not correspond with protected lands however. Large portions of the richest hotspots of local rarity do not correspond with protected lands. The majority of hotspots in the central portion of the county also do not correspond with protected areas (Figure 4.9c).

Multi-scale hotspots and protected lands show similar levels of correspondence. Hotspots in the southern part of the county correspond relatively well. Some portions of the Mount St. Helena/Sugarloaf Mountain hotspot correspond with protected land, but the richest portions do not. Unfortunately, the majority of multi-scale hotspots in the Napa Valley and Mayacamas Mountains do not correspond with protected lands (Figure 4.9d).

Discussion

Global Rarity Hotspot Conservation

At the 25 m² scale of analysis, G- and S-ranked taxa are distributed in approximately 15% of Napa County but hotspots of these ranked plants are distributed in only 3.5% of the county. At the 1 km² scale, G- and S-ranked taxa are distributed in approximately 38% of Napa County but global rarity hotspots are distributed in only 15.6% of the county. These percentages indicate that G- and S-ranked plant taxa are more frequently distributed apart from other rare taxa than in hotspots. As a result, conservation efforts focusing strictly on hotspots may not encompass a majority of rare plant distributions.

Alternately, the richest global rarity hotspot cells in Napa can be protected in an area covering only 0.5% (2.4% at 1 km² scale) of the county. It seems, therefore, that identification of global rarity hotspots in Napa is advantageous for conservation of G- and S-ranked plants at the county scale.

Local Rarity Hotspot Conservation

Through the analysis of the distributions of globally common plants in Napa County, several locally rare plant taxa are identified here using the criteria outlined in Chapter 3. The results presented here indicate that with available data, criteria outlined in Chapter 3 for classifying locally rare plants can be usefully applied at the county level to identify significant peripheral or “edge of range” plant populations. Individual counties are geographically unique in size and shape however, and these factors should be considered when applying this system to other areas.

Many biologically significant plant populations highlighted in this analysis are not currently considered for conservation status. As these populations are often ecologically and evolutionarily significant (Leppig & White 2006), they may not be eligible for conservation status according to the current legislation (ESA 1973, CEQA 2005) and should be managed accordingly at the county scale.

At the 1 km² scale, L-ranked taxa are distributed in approximately 31% of Napa County but local rarity hotspots are distributed in only 16.1% of the county. This indicates that L-ranked plant taxa are also more frequently distributed alone than in hotspots. Again, conservation efforts focusing strictly on hotspots may not encompass a

majority of rare plant distributions. Alternately, the richest local rarity hotspot cells in Napa can be protected in an area covering only 0.04% of the county, which is a realistic goal. The results also indicate that identification of local rarity hotspots in Napa can focus conservation planning efforts at the county scale.

Multi-scale Hotspot Conservation

A large proportion of Napa County ($\approx 58\%$, 1km scale of analysis) is occupied by rare plant taxa from at least one assessment level. This proportion is reduced significantly ($\approx 27\%$) when only considering rarity richness hotspots, but is still quite large. Again, however, the total distribution of multi-scale hotspots is quite limited and equates to only 4% of Napa County, which is a realistic conservation goal.

Current research suggests that hotspot reserves should not only be designed to protect species richness, but also to include adaptive variability (Smith et al. 2001). Conservation of multi-scale hotspots in conjunction with other hotspots can aid significantly in this effort by incorporating a larger variety of biological attributes than contained in global rarity hotspots alone. Of all global hotspots, approximately 26% are also multi-scale hotspots; indicating that protecting multi-scale rarity hotspots will not frequently aid in the protection of locally rare hotspots, and therefore, not be the only conservation goals.

It seems that a variety of protected areas may be the best solution for protecting rare plants in Napa County. Although some L-ranked plant taxa will fall under the conservation umbrella of G- or S-ranked taxa, many of the richest cells for local rarity do

not correspond with distributions of G- or S-ranked plants and remain unprotected in any way. As is often the case in conservation planning, G-, S-, and L-ranked plants will require the employment of a variety of different strategies suited to individual taxa and locations (Schemske 1994; Wu & Smeins 2000; Draper et al. 2003). Hotspots should be prioritized to best represent richness and diversity of global and sub-national rarity but should incorporate multi-scale and local rarity hotspots as well when given the option.

Rare Plant Habitats

Habitat data is an important factor for protecting rare plants (Wiser 1998; Wu & Smeins 2000). G- and S-ranked plants show highly variable distributions relative to habitat types in Napa County. With the exception of the Douglas Fir- Ponderosa Pine Alliance, rare plant distributions are generally correlated with habitat types as is expected due to chance alone based on the area of the habitat's distribution. This distribution pattern seems to reflect Napa's heterogenous geography, which allows the opportunity for many of Napa's rare taxa to adapt to and thrive in a variety of unique habitats. Although the Douglas Fir- Ponderosa Pine Alliance *is* a rare habitat in Napa County, it was the only habitat association exceeding the 95% prediction interval, thus, conclusions presented here do not strongly indicate that rare plants are correlated with rare habitats.

Similarly to G- and S-ranked plant distributions, global rarity hotspots are not strictly associated with uncommon habitat types. However, the three habitat types exceeding 95% prediction intervals: the Douglas Fir- Ponderosa Pine Alliance, the Mixed Manzanita- (Interior Live Oak- California Bay- Chamise) West County NFD Alliance,

and the Black Oak Alliance, are rare and should be considered as habitat targets. Again however, the habitat types most commonly associated with rarity hotspots are the “disturbed” urban and agricultural habitats that will require different conservation strategies than those used on protected lands.

Conservation strategies should consider incorporation of various rare and common habitats when determining priorities in Napa County. Specific consideration should be given to the Douglas Fir- Ponderosa Pine Alliance as a habitat target where appropriate. Interestingly however, G- and S-ranked plant taxa are often associated with “disturbed” habitat types such as agricultural and urban areas. This greatly influences what the most appropriate conservation strategies for these areas may be.

In terms of the proportions of specific habitat types corresponding with G- or S-ranked using 25 m² cells, the most consistently occupied habitats, including the Sugar Pine- Canyon Oak NFD Alliance, Ponderosa Pine Alliance, and Douglas Fir- Ponderosa Pine Alliance, should be considered habitat targets. In regards to the proportions of specific habitat types corresponding with global rarity hotspots using 25 m² cells, the most consistently occupied habitats, including the Ponderosa Pine Alliance, Serpentine Barrens, and Tanbark Oak Alliance, should also be considered conservation target habitats.

Although analysis of local rarity in relation to habitat types was not possible due to scale issues, locally rare plants do correspond somewhat with globally rarity, and thus

protection of G- and S-ranked plant habitats will in part aid in the conservation of L-ranked plant habitats.

Effects of Scale of Analysis on Rarity Models

Multiple scale raster GIS analysis of the distributions of rare plants in Napa County allows for successful identification of distribution patterns at various scales. At either scale of analysis used in this study (25 m² & 1 km² cells), the distributions of G- and S-ranked plants and richness patterns generally correspond but summarizing their distributions into increasing cell sizes greatly affects apparent area of occupancy estimates. Increasing cell sizes from 25 m² to 1 km² more than doubles the apparent area occupied by rare plant taxa and increases the apparent area occupied by multiple rare plants by more than four times. Furthermore, the percentage of cells occupied by five or more rare plant taxa (the richest hotspots) increases by almost five times when using 1 km² cells. Finally, it should be noted that the number of rare plants occupying the richest hotspot also increases from eight to nine as cell size is increased.

These effects stem from using the “blockmax” function, which increases the apparent area of distributions as cell size increases, but insures extremely small populations were not eliminated. This is an extremely important tradeoff when mapping rare plants as they are inherently distributed in relatively small populations that can be missed using other functions in GIS. As a result of the “blockmax” function, a higher percentage of cells are occupied, and more taxa occupy individual cells, but overall distributions remained similar.

Therefore, both scales of distribution data are useful when used appropriately. Although smaller scale data analysis can artificially increase apparent distribution areas and richness levels and can even produce different results (Gaston & Lawton 1990), it can be collected more rapidly and is more practical for larger scale conservation efforts. This is a valuable feature when dealing rare and threatened plant taxa. If reserves are prioritized at the 1 km² scale, they may provide more of a buffer zone surrounding rare plant populations or hotspots within each cell by increasing the minimum area highlighted for protection.

Conversely, since increased cell size results in larger area of occupancy estimates, results from 1 km² analysis can be misleading and affect conservation cost estimates if the model is adopted. Also, not all habitats within larger patches of land are always suitable for protecting rare taxa, indicating several smaller scale land patches may be more suitable for conservation efforts (Wolf 2001). Furthermore, prioritization of smaller areas for conservation reduces land use conflicts (Wu & Smeins 2000). In any case the best scale of analysis depends specifically on the purpose and scope of the study (Draper et al. 2003) and using multiple scales of analysis only strengthens understanding of any given area (Poiani et al. 2000; Gärdenfors 2001; Venevsky & Venevskaja 2005).

Effects of Scale of Analysis on Habitat Models

Summarizing habitat data into 1 km² cells produces significantly different distribution results than those generated from 25 m² data. Although the majority of the most common vegetation types remained in the data set, ten extremely rare vegetation

types (distributed in <0.15% of Napa County) were lost in the 1 km² summary. When analyzing relationships with rare habitat types, particularly the rare types, this can greatly affect results, and thus is further evidence for the benefits of collecting and analyzing data at multiple scales.

Still, this comparison of results generated by different scales of data analysis emphasizes the importance of using multiple scales of analysis for effectively identifying conservation priorities. As other studies have shown (White 1999; Wu & Smeins 2000) different scales of analysis affect overall outcomes, and each has benefits and shortcomings for identifying conservation priorities. Although collection of fine scale data can be expensive and time consuming, it is far more accurate than larger scale data for identifying local biological relationships. It also minimizes area of occupancy measures, which in turn minimizes the prioritized cost and conflict of interest (Wu & Smeins 2000). This is especially important when collaborating on conservation efforts with private landowners in rapidly developing areas like Napa County where land is extremely valuable.

Conservation Strategies

Rosenzweig (2003) outlines three broad conservation strategies that are applicable to the situation in Napa County. They are reservation, restoration, and reconciliation strategies. Reservation strategies are simply setting aside lands to preserve natural habitats. In Napa, the three richest global rarity hotspots not corresponding with current protected lands, a portion of the Mount St. Helena, the area south of Calistoga, and the

area near Angwin, should be prioritized for conservation efforts first. Following this, all unprotected portions of G- and S-ranked plant distributions should be prioritized as well.

Within the set of global rarity hotspots, protection of multi-scale hotspots should also be an early consideration as it is likely the most cost-effective method for protecting a variety of rare plants and adaptive variation. Significant multi-scale hotspots such as the St. Helena area, unprotected portions of the Mount St. Helena area, two locations surrounding Calistoga, the Three Peaks area, the Mount Veeder area, and the American Canyon Creek area qualify here.

Finally, unprotected locally rare plant richness hotspots not corresponding with larger scale rarity hotspots should be prioritized. These areas include the Diamond Mountain area, the Sulfur Canyon area, the Atlas Peak area, and the two areas near Blue Ridge Road and Mix Canyon Road along the Napa/Solano border. Again, distributions of single L-ranked plant taxa should not be ignored and should be protected whenever possible.

In locations already assigned reservation status, use of restoration strategies is encouraged (Rosenzweig 2003). Many of the reserved lands in Napa County are still threatened by a variety of factors such as fire and erosion, which can adversely affect rare plant populations. In these locations efforts should focus on restoring protected areas and creating more suitable habitats for rare plants within existing reserves. Habitat data presented here at the 25 m² can be used to guide habitat conservation and restoration efforts to maximize globally rare plant habitat where necessary. As some of the locally

rare plant distributions and hotspots correspond with global rarity distributions, protection of these habitats will incidentally aid in locally rare plant habitat conservation.

Preservation of a variety of rare plant hotspots is a plausible goal, even in a rapidly growing area like Napa, considering many hotspots already reside on protected lands. Doing so will provide valuable protection for a large number of rare plant taxa as well as maintain habitats for other plant and animal taxa.

Hotspots of rare plants often correspond with hotspots of other groups of endemic species (Myers et al 2000) and may afford us the opportunity to streamline conservation efforts in Napa County for a variety of non-plant taxa as well. Further research is needed however, and studies of other taxonomic groups in Napa County using methods similar to those presented here are strongly encouraged.

Finally, in many cases, reservation or restoration is not possible in Napa County. In these cases reconciliation strategies, or strategies to reduce human impact on the environment, are encouraged. The most obvious situation where this may be necessary is in the vineyards of Napa County, which are the leading causes of habitat loss and alteration. In these cases simple reconciliation strategies can help to protect rare plant taxa in many cases. Activities such as dry farming to reduce water usage and using smaller amounts of pesticides to lessen disturbance to plant-pollinators can have remarkable effects on the health of the immediate and surrounding areas and the rare plant populations they may support. Many rare plants are disturbance oriented and can adapt to and survive in human impacted environments. By simply becoming familiarized

with their distributions, harmful activities can be avoided in these situations to prevent the extirpation of rare plants.

This study is to be considered a preliminary analysis of the distributions of rare plants in Napa County and a test of the local rarity criteria outlined in Chapter 3. It is believed that this system can be successfully used to aid in rare plant conservation at multiple scales. Incorporation of this system is encouraged in local conservation planning efforts and in rare plant conservation efforts throughout the California Floristic Province. This system will only improve as better data become available but it provides valuable information in its current format.

This study may also facilitate more focused analysis of individual hotspots in Napa County, as well as the distributions of multiple scales of rarity in other areas of California and in other global diversity hotspots. Data availability is commonly the most limiting factor for studies such as the one presented here, however plant distribution data is currently available for each county in the State of California (Viers et al. 2006) and is improving in numerous areas. Many significant biological areas cross political boundaries (Abbitt et al. 2000) and cooperation between scientists and multiple government agencies is necessary for conservation programs to be most effective (Schemske et al. 1994). Improvement of our understanding of the global distribution of biodiversity is one of the most significant objectives for ecologists and biogeographers (Gaston 2000). Hopefully this project helps meet this objective.

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APPENDIX A

A CHECKLIST OF THE NATIVE VASCULAR FLORA OF NAPA COUNTY, CA, U.S.A.

The checklist is arranged by major plant groups, then alphabetically by family and species. Nomenclature generally follows Hrusa (2005) and Jepson Flora Project (2005). Common names are generally from Calflora (2000). All plants listed are California natives. Rare plants are indicated by an element rank following the common names. G- and S-ranks follow CNDDDB (2007).

PTEROPHYTES

BLECHNACEAE

Woodwardia fimbriata Sm., giant chain fern,
Chain fern, giant chainfern, Western
Chain Fern

DENNSTAEDTIACEAE

Pteridium aquilinum (L.) Kuhn var. *pubescens*
Underw., hairy brackenfern, Bracken,
Western Bracken, Bracken fern, bracken-
fern, Western bracken fern

DRYOPTERIDACEAE

Athyrium filix-femina (L.) Roth var.
cyclosorum Rupr., lady fern, subarctic
lady-fern, Common Lady Fern, Western
Lady Fern
Dryopteris arguta (Kaulf.) Maxon, coastal
wood fern, Shield Fern, wood fern,
California wood fern, coastal woodfern
Polystichum californicum (D.C. Eaton) Diels,
California swordfern, California sword
fern
Polystichum munitum (Kaulf.) C. Presl, sword
fern, western sword fern, western
swordfern

EQUISETACEAE

Equisetum palustre L., marsh horsetail, **G5S1S2**
Equisetum telmateia Ehrh. subsp. *braunii* (Milde)
R.L. Hauke, giant horse tail, giant horsetail

POLYPODIACEAE

Polypodium californicum Kaulf., California
polypody
Polypodium calirhiza S.A. Whitmore & A.R. Sm.,
nested polypody, acrid fern, Licorice Fern
Polypodium glycyrrhiza D.C. Eaton, licorice fern

PTERIDACEAE

Adiantum aleuticum (Rupr.) C.A. Paris, five-finger
fern, Western Five-finger, five-fingered fern,
five-finger maidenhair
Adiantum jordanii Mueller, California maiden-hair,
California maidenhair, California maidenhair
fern
Aspidotis californica (Hook.) Copel., California
lace-fern, California lacefern
Aspidotis densa (Brackenr.) Lellingner, Indian's
dream, Cliffbrake, Lace fern
Cheilanthes covillei Maxon, Coville's lipfern,
Coville's lip fern, **L3**
Cheilanthes gracillima D.C. Eaton, Lace Lip Fern,
lace lip-fern, lace lipfern, Lace fern
Cheilanthes intertexta (Maxon) Maxon, coastal
lipfern

- Pellaea andromedifolia* (Kaulf.) Fee, coffee fern, coffee cliffbrake
Pellaea mucronata (D.C. Eaton) D.C. Eaton, birdfoot cliffbrake, Birdfoot Fern, bird's-foot fern
Pellaea mucronata (D.C. Eaton) D.C. Eaton var. *mucronata*, bird's-foot fern
Pentagramma triangularis (Kaulf.) G. Yatskievych, Windham & Wollenweber, Goldenback Fern, gold-back fern

SELAGINELLACEAE

- Selaginella bigelovii* L. Underw., Spike Moss, bushy spikemoss, Bigelow's spike-moss, Moss Fern, Bigelow's moss-fern
Selaginella wallacei Hieron., Wallace Moss Fern, Wallace's spikemoss, Wallace's spike-moss

GYMNOSPERMS

CUPRESSACEAE

- Calocedrus decurrens* (Torr.) Florin, incense cedar, white cedar, post cedar, bastard cedar
Cupressus bakeri Jeps., Baker's cypress, Modoc cypress, **G3S3.2**
Cupressus macnabiana A. Murray, MacNab's cypress
Cupressus sargentii Jeps., Sargent's cypress, Sargent Cypress
Juniperus californica Carriere, California juniper

PINACEAE

- Pinus attenuata* Lemm., knobcone pine, scrub pine
Pinus lambertiana Douglas, sugar pine
Pinus ponderosa Laws., bull pine, silver pine, western yellow pine, ponderosa pine, pitch pine, yellow pine
Pinus sabiniana Douglas, foothill pine, gray pine, pinon pine, nut pine, grey pine, Digger pine (seldom used historical name, derogatory), California foothill pine, bull pine
Pseudotsuga menziesii (Mirb.) Franco var. *menziesii*, western Douglas-fir, Douglas-fir, false hemlock, red-fir, Douglas-spruce, Oregon pine

TAXACEAE

- Torreya californica* Torr., California torreya, California nutmeg

TAXODIACEAE

- Sequoia sempervirens* (D. Don) Endl., redwood, coast redwood

ANGIOSPERMS

ACERACEAE

- Acer macrophyllum* Purshbig, leaf maple, bigleaf maple
Acer negundo L. var. *californicum* (Torrey & A. Gray), box elder, California Box Elder

ALISMATACEAE

- Alisma plantago-aquatica* L., water plantain
Damasonium californicum Benth., California damsonium
Echinodorus berteroi (Spreng.) Fassett, burhead, upright burhead
Sagittaria latifolia Willd., Wappato, tule potato, broad-leaf arrowhead, broadleaf arrowhead

AMARANTHACEAE

- Amaranthus blitoides* S. Watson, mat amaranth, Prostrate Amaranth, prostrate pigweed
Amaranthus californicus (Moq.) S. Watson, California pigweed, California amaranth
Chenopodium berlandieri Moq., Berlandier's goosefoot, pit-seed goosefoot, pitseed goosefoot
Chenopodium californicum (S. Watson) S. Watson, California goosefoot, Pigweed, soaproot
Chenopodium rubrum L., red goosefoot

ANACARDIACEAE

- Rhus trilobata* Torr. & A. Gray, squawbush (seldom used historical name, derogatory), Skunkbrush, skunkbush sumac
Toxicodendron diversilobum (Torr. & A. Gray) Greene, Poisonoak, poison oak, poison, Pacific poison oak

APIACEAE

- Angelica californica* Jeps., California angelica
Angelica tomentosa S. Watson, woolly angelica,
L3
Apiastrum angustifolium Nutt., mock parsley, wild celery, wild parsley

- Berula erecta* (Hudson) Coville, cutleaf waterparsnip, Water parsnip, cutleaf waterparsnip, cut-leaved water parsnip
- Bowlesia incana* Ruiz & Pav., hoary bowlesia, bowlesia, **L3**
- Cicuta douglasii* (DC.) J.M. Coult. & Rose, Western Water-Hemlock, western water hemlock
- Daucus pusillus* Michx., rattlesnake weed, American wild carrot, Wild carrot
- Eryngium aristulatum* Jeps., Jepson's button-celery, California eryngo
- Eryngium aristulatum* Jeps. var. *aristulatum*, Jepson's button-celery, California eryngo
- Eryngium armatum* (S. Watson) J.M. Coult. & Rose, prickly coyote-thistle, coastal eryngo, Coyote Thistle, **L2**
- Eryngium articulatum* Hook., beethistle, coyote-thistle
- Eryngium constancei* Y. Sheikh, Loch Lomond button-celery, **G1S1.1**
- Eryngium vaseyi* J.M. Coult. & Rose, coyote-thistle, coyotethistle, **LH?**
- Heracleum lanatum* Michx., cow parsnip, Cow-Parsnip
- Hydrocotyle ranunculoides* L. f., floating marsh-pennywort, Marsh Pennywort, floating marshpennywort
- Lilaeopsis masonii* Mathias & Constance, Mason's lilaeopsis, mudflat quillplant, **G3S3.1**
- Lomatium californicum* (Torr. & A. Gray) Mathias & Constance, California lomatium, Celery Weed
- Lomatium caruifolium* (Hook. & Arn.) J.M. Coult. & Rose, caraway-leaved lomatium, Alkali parsnip, alkali desertparsley, **LH?**
- Lomatium caruifolium* (Hook. & Arn.) J.M. Coult. & Rose var. *denticulatum* Jeps., caraway-leaved lomatium, alkali desertparsley
- Lomatium dasycarpum* (Torr. & A. Gray) J.M. Coult. & Rose, woolly-fruited lomatium, Hog Fennel, woollyfruit desertparsley, Lace Parsnip, **L1**
- Lomatium dasycarpum* (Torr. & A. Gray) J.M. Coult. & Rose subsp. *dasycarpum*, woolly-fruited lomatium, woollyfruit desertparsley
- Lomatium dasycarpum* (Torr. & A. Gray) J.M. Coult. & Rose subsp. *tomentosum* (Benth.) Theob., woollyfruit desertparsley, woolly-fruited lomatium
- Lomatium dissectum* (Torr. & A. Gray) Mathias & Constance var. *dissectum*, fern-leaved lomatium, fernleaf biscuitroot, **LH?**
- Lomatium hooveri* (Mathias & Constance) Constance & Ertter, Hoover's lomatium, **G3S3.3**
- Lomatium macrocarpum* (Torr. & A. Gray) J.M. Coult. & Rose, bigseed biscuitroot, large-fruited lomatium
- Lomatium marginatum* (Benth.) J.M. Coult. & Rose, Tall hog-fennel, Hartweg's lomatium, butte desertparsley
- Lomatium marginatum* (Benth.) J.M. Coult. & Rose var. *purpureum* Jeps., butte desertparsley, Jepson's lomatium
- Lomatium nudicaule* (Pursh) J.M. Coult. & Rose, barestem biscuitroot, Pestle parsnip, pestle lomatium
- Lomatium repostum* (Jeps.) Mathias, Napa biscuitroot, Napa lomatium, **G3S3.3**
- Lomatium utriculatum* (Torr. & A. Gray) J.M. Coult. & Rose, common lomatium, Bladder Parsnip, Hog Fennel
- Lomatium vaginatum* (M.E. Jones) J. Coulter & Rose, broadsheath desertparsley, sheathed lomatium, **L3**
- Oenanthe sarmentosa* J. Presl, Pacific oenanthe, water parsely, Water Parsley
- Osmorhiza chilensis* Hook. & Arn., Sweet Cicely, mountain sweet-cicely, Mountain sweetcicely, Western Sweet-Cicely
- Perideridia gairdneri* (Hook. & Arn.) Mathias, Gairdner's yampah, Squaw root (seldom used historical name, derogatory), Gardner's yampah
- Perideridia gairdneri* (Hook. & Arn.) Mathias subsp. *gairdneri*, Gairdner's yampah, Squaw Potato (seldom used historical name, derogatory), Southern squaw root (seldom used historical name, derogatory), **G5T3S3.2**
- Perideridia kelloggii* (A. Gray) Mathias, Kellogg's yampah, Yampah
- Perideridia oregana* (S. Watson) Mathias, squaw potato (seldom used historical name, derogatory), Oregon yampah
- Sanicula bipinnata* Hook. & Arn., poison sanicle

Sanicula bipinnatifida Hook., snakeroot, purple sanicle
Sanicula crassicaulis DC., Pacific sanicle, Gamble weed, Pacific blacksnakeroot
Sanicula laciniata Hook. & Arn., coastal blacksnakeroot, coast sanicle
Sanicula tuberosa Torr., Tuberos sanicle, turkey pea, Turkey-Pea
Sium suave Walter, hemlock water-parsnip, hemlock waterparsnip
Tauschia glauca (J.M. Coult. & Rose) Mathias & Constance, glaucous umbrellawort, glaucous tauschia, **G4S3.3**
Yabea microcarpa (Hook. & Arn.) Koso-Polj., false carrot, California hedge-parsley, California hedge parsley, Hedge parsley

APOCYNACEAE

Apocynum androsaemifolium L., bitter dogbane, Spreading Dogbane
Apocynum cannabinum L., Indianhemp dogbane, Indian hemp

ARACEAE

Lemna minor L., Duckweed, common duckweed, smaller duckweed
Lemna minuta Kunth, Least Duckweed
Lemna trisulca L., ivy-leaved duckweed, star duckweed, **LH?**

ARALIACEAE

Aralia californica S. Watson, elk's clover, Elkclover, prairie sagewort, California spikenard

ARISTOLOCHIACEAE

Aristolochia californica Torr., Dutchmans pipe, Dutchman's pipe, California Pipe Vine, California pipevine
Asarum caudatum Lindl., wild ginger, Longtail wild ginger, creeping wild-ginger

ASCLEPIADACEAE

Asclepias californica Greene, California milkweed
Asclepias cordifolia (Benth.) Jeps., heart-leaf milkweed, Purple Milkweed, heartleaf milkweed
Asclepias eriocarpa Benth., Kotolo milkweed, Indian milkweed

Asclepias fascicularis Dcne., narrow-leaf milkweed, narrowleaf milkweed, Narrow-leaved Milkweed, Mexican whorled milkweed, Milkweed
Asclepias solanoana Woodson, serpentine milkweed, solanoa, **G3S3.2**
Asclepias speciosa Torrey, showy milkweed

ASTERACEAE

Achillea millefolium L., common yarrow, yarrow
Achyrachaena mollis Schauer, blow-wives, soft blow wives
Adenocaulon bicolor Hook., American trailplant, Trail Plant
Agoseris grandiflora (Nutt.) Greene, California Dandelion, large-flowered agoseris, Giant mountain-dandelion, bigflower agoseris, Grand mountain dandelion
Agoseris heterophylla (Nutt.) Greene, Annual mountain dandelion, annual agoseris, mountain-dandelion
Agoseris hirsuta (Hook.) Greene, seaside agoseris, woolly goat chicory, Coast Dandelion
Agoseris retrorsa (Benth.) Greene, spearleaf agoseris, spear-leaved agoseris, Spearleaf mountain dandelion
Ambrosia psilostachya DC., western ragweed, Ragweed
Ancistrocarphus filagineus A. Gray, woolly fishhooks, false neststraw
Anisocarpus madioides Nutt., woodland madia, forest madia
Arnica discoidea Benth., rayless arnica
Artemisia californica Less., California sagebrush, Coast sagebrush, coastal sage brush
Artemisia douglasiana Besser, Douglas' sagewort, Mugwort, California Mugwort
Aster chilensis Nees, common California aster, California Aster
Aster lentus Greene, Suisun Marsh aster, **G2S2.2**
Aster occidentalis (Nutt.) Torr. & A. Gray, western mountain aster
Aster occidentalis (Nutt.) Torr. & A. Gray var. *occidentalis*, Western Aster, western mountain aster
Aster radulinus A. Gray, rough-leaved aster
Aster subulatus Michx. var. *ligulatus* Shinnery, annual water-aster, slimaster
Baccharis douglasii DC., saltmarsh baccharis, Douglas' baccharis, salt marsh baccharis

- Baccharis pilularis* DC., dwarf chaparral broom, coyote brush
- Baccharis salicifolia* (Ruiz & Pav.) Pers., mulefat, mule's fat, mule-fat, Mule Fat., Seep Willow
- Balsamorhiza macrolepis* Sharp, California balsamroot, big-scale balsam-root, **LH?**
- Balsamorhiza macrolepis* Sharp var. *macrolepis*, California balsamroot, big-scale balsamroot, **G3G4T2S2.2**
- Balsamorhiza macrolepis* W.M. Sharp var. *platylepis* (W.M. Sharp) Ferris, California balsamroot, flat-scale balsam-root
- Blennosperma nanum* (Hook.) S.F. Blake, common blennosperma, common stickyseed
- Blennosperma nanum* (Hook.) S.F. Blake var. *nanum*, common blennosperma, common stickyseed
- Brickellia californica* (Torr. & A. Gray) A. Gray, brickell bush, California brickellbush, California brickellia
- Calycadenia micrantha* R. L. Carr & G. D. Carr, small-flowered calycadenia, **G2G3S2S3.2**
- Calycadenia multiglandulosa* DC., sticky calycadenia, rosin weed, sticky western rosinweed
- Calycadenia pauciflora* A. Gray, small-flowered calycadenia, smallflower western rosinweed
- Calycadenia truncata* DC., rosin weed
- Centromadia fitchii* (A. Gray) Greene, Fitch's tarweed, Fitch's Spikeweed, Fitch spikeweed, spikeweed
- Centromadia parryi* (Green) Green, Parry spikeweed, Parry's tarweed, pappose tarweed
- Centromadia parryi* (Green) Green subsp. *parryi*, pappose tarplant, **G4?T2S2.2**
- Centromadia pungens* (Hook. & Arn.) Greene, common spikeweed, common tarweed
- Centromadia pungens* (Hook. & Arn.) Greene subsp. *maritima* (Greene) B.G. Baldwin, common tarweed, maritime spikeweed
- Chaenactis glabriuscula* DC., common yellow chaenactis, yellow pincushion
- Chaenactis glabriuscula* DC. var. *glabriuscula*, common yellow chaenactis, yellow pincushion
- Chaenactis glabriuscula* DC. var. *heterocarpha* (A. Gray) H.M. Hall, variable-fruited yellow chaenactis, yellow pincushion
- Chaenactis glabriuscula* DC. var. *megacephala* A. Gray, big-headed yellow chaenactis, yellow pincushion
- Chrysothamnus nauseosus* (Pallas) Britton, Mohave Rubberbrush, common rabbitbrush
- Chrysothamnus nauseosus* (Pallas) Britton subsp. *albicaulis* (Nutt.) H.M. Hall & Clem., White-Stemmed Rabbitbrush, white-stemmed common rabbitbrush, Rubber rabbitbrush
- Cirsium cymosum* (Greene) J.T. Howell, peregrine thistle
- Cirsium douglasii* DC., swamp thistle, Douglas' thistle
- Cirsium douglasii* DC. var. *douglasii*, Douglas' swamp thistle, Douglas' thistle
- Cirsium occidentale* (Nutt.) Jeps., cobwebby thistle, Cobweb Thistle, western thistle
- Cirsium occidentale* (Nutt.) Jeps. var. *venustum* (Greene) Jeps., Venus thistle, red thistle, coulter's thistle, cobwebby thistle
- Cirsium quercetorum* (A. Gray) Jeps., Alameda County thistle, brownie thistle
- Cirsium remotifolium* (Hook.) DC., few-leaved thistle, fewleaf thistle
- Conyza canadensis* (L.) Cronq., horseweed, Canadian Horseweed, Canada horseweed
- Deinandra corymbosa* (DC.) Torr. & A. Gray, coastal tarweed
- Eclipta prostrata* (L.) L., false daisy
- Ericameria arborescens* (A. Gray) Greene, golden fleece, goldenfleece
- Ericameria linearifolia* (DC.) Urb. & J. Wussow, Linear-leaved goldenbush, narrowleaf goldenbush, interior goldenbush
- Erigeron algidus* Jeps., stalked fleabane, **LH?**
- Erigeron angustatus* Greene, serpentine fleabane, narrow-leaved daisy, **G1S1.2?**
- Erigeron biolettii* Greene, streamside daisy, Biolett's erigeron, **G3?S3?**
- Erigeron foliosus* Nutt. var. *foliosus*, Thread-stemmed fleabane, fleabane, leafy fleabane, **LH?**
- Erigeron foliosus* Nutt. var. *franciscensis* G.L. Nesom, Franciscan erigeron, San Francisco leafy fleabane
- Erigeron inornatus* A. Gray, rayless fleabane, California rayless daisy, California rayless fleabane

- Erigeron petrophilus* Greene, cliff fleabane, rockloving erigeron
- Erigeron petrophilus* Greene var. *petrophilus*, cliff fleabane, rockloving erigeron
- Erigeron philadelphicus* L., Philadelphia fleabane
- Erigeron reductus* (Cronq.) G.L. Nesom, lesser California rayless fleabane, rayless daisy, Fleabane, **L3**
- Erigeron reductus* (Cronq.) G.L. Nesom var. *angustatus* (A. Gray) G.L. Nesom, narrow-leaved rayless daisy, lesser California rayless fleabane, Pine Erigeron, **L3**
- Eriophyllum confertiflorum* (DC.) A. Gray, Yellow Yarrow, golden-yarrow, golden yarrow
- Eriophyllum confertiflorum* (DC.) A. Gray var. *confertiflorum*, Yellow Yarrow, golden yarrow, golden-yarrow
- Eriophyllum lanatum* (Pursh) J. Forbes, common woolly sunflower, woolly sunflower, Woolly Sunflower, Common woollysunflower
- Eriophyllum lanatum* (Pursh) J. Forbes var. *achillaeoides* (DC.) Jeps., Woolly sunflower, yarrow woolly sunflower, common woolly sunflower, Yarrow-Leaved Woolly-Sunflower
- Eriophyllum lanatum* (Pursh) J. Forbes var. *arachnoideum* (F.E. Fisch. & Ave-Lall.) Jeps., common woolly sunflower, spiderweb sunflower, Woolly Sunflower
- Eriophyllum latilobum* Rydb., San Mateo woolly sunflower, **G1S1.1**
- Filago californica* Nutt., California herba impia, Filago, California cottonrose, California filago
- Gnaphalium bicolor* Bioletti, bicolored everlasting, Bioletti's cudweed, **L2**
- Gnaphalium californicum* DC., California cudweed, green everlasting, California everlasting
- Gnaphalium canescens* DC., everlasting cudweed, **L2**
- Gnaphalium canescens* DC. subsp. *beneolens* (Davidson) Stebb. & D.J. Keil, fragrant everlasting, everlasting cudweed, Cudweed
- Gnaphalium canescens* DC. subsp. *microcephalum* (Nutt.) Stebb. & D.J. Keil, white everlasting
- Gnaphalium palustre* Nutt., western marsh cudweed, Lowland Cudweed
- Gnaphalium purpureum* L., purple everlasting, purple cudweed
- Gnaphalium ramosissimum* Nutt., pink cudweed, pink everlasting
- Gnaphalium stramineum* Kunth, Chilean cudweed, Small-flowered cudweed, Everlasting Cudweed, cotton-batting
- Grindelia camporum* Greene, Great Valley gumweed, Gum Plant, Gumweed, Common gumplant
- Grindelia camporum* Greene var. *camporum*, Great Valley gumweed
- Grindelia hirsutula* Hook. & Arn., hairy gumweed, Gumweed
- Grindelia hirsutula* Hook. & Arn. var. *davyi* (Jeps.) M.A. Lane, hairy gumweed, Davy's gumweed
- Grindelia hirsutula* Hook. & Arn. var. *hirsutula*, Gumweed, hairy gumweed
- Grindelia nana* Nutt., Idaho resinweed, Idaho gumweed
- Grindelia stricta* DC. var. *angustifolia* (A. Gray) M.A. Lane, Oregon gumweed, marsh gumplant, **L3**
- Gutierrezia californica* (DC.) Torr. & A. Gray, California matchweed, Matchweed, Snakeweed, San Joaquin snakeweed
- Gutierrezia sarothrae* (Pursh) Britton & Rusby, Common snakeweed, Matchweed, broom snakeweed, **LH?**
- Harmonia hallii* (D. D. Keck) B. G. Baldwin, Hall's harmonia, **G2S2.2**
- Harmonia nutans* (Greene) B. G. Baldwin, nodding harmonia, **G3S3.3**
- Helenium bigelovii* A. Gray, Bigelow's sneezeweed, Sneezeweed
- Helenium puberulum* DC., Sneezeweed, rosilla
- Helianthella californica* A. Gray, California helianthella
- Helianthella californica* A. Gray var. *californica*, California helianthella
- Helianthus annuus* L., Sunflower, common sunflower, Hairy-leaved sunflower
- Helianthus bolanderi* A. Gray, serpentine sunflower, Bolander's sunflower
- Helianthus californicus* DC., California sunflower
- Helianthus exilis* A. Gray, serpentine sunflower, **G3QS3.2**

- Helianthus gracilentus* A. Gray, slender sunflower
- Hemizonia congesta* DC., hayfield tarweed
- Hemizonia congesta* DC. subsp. *clevelandii* (Greene) Babc. & H.M. Hall, hayfield tarweed, Cleveland's tarweed
- Hemizonia congesta* DC. subsp. *congesta*, hayfield tarweed
- Hemizonia congesta* DC. subsp. *luzulifolia* (DC.) Babc. & H.M. Hall, hayfield tarweed, woodrush tarweed
- Hesperevax acaulis* (Kellogg) E. Greene, dwarf evax, stemless dwarf-cudweed
- Hesperevax acaulis* (Kellogg) Greene var. *robustior* Morefield, big evax, stemless dwarf-cudweed
- Hesperevax caulescens* (Benth.) A. Gray, dwarf dwarf-cudweed, hogwallow starfish, **G3S3.2**
- Hesperevax sparsiflora* (A. Gray) Greene, erect dwarf-cudweed, Erect Evax, few-flowered evax
- Hesperevax sparsiflora* (A. Gray) Greene var. *sparsiflora*, few-flowered evax, erect dwarf-cudweed
- Heterotheca grandiflora* Nutt., telegraph weed, telegraphweed
- Heterotheca oregona* (Nutt.) Shinners var. *compacta* (D.D. Keck) Semple, compact Oregon goldenaster, Oregon false goldenaster
- Heterotheca oregona* (Nutt.) Shinners var. *rudis* (Greene) Semple, Oregon false goldenaster, red Oregon goldenaster
- Heterotheca sessiliflora* (Nutt.) Shinn. subsp. *bolanderi* (A. Gray) Semple, Bolander's goldenaster, Golden Aster, sessileflower false goldenaster, **L2**
- Hieracium albiflorum* Hook., white hawkweed, Hawkweed, White-Flowered Hawkweed
- Holocarpha virgata* (A. Gray) D.D. Keck, Pitgland tarweed, narrow tarplant, yellowflower tarweed
- Holocarpha virgata* (A. Gray) D.D. Keck subsp. *virgata*, narrow tarplant, yellowflower tarweed
- Holozonia filipes* (Hook. & Arn.) Greene, Greene's white-crown, whitecrown, Holozonia
- Iva axillaris* Pursh subsp. *robustior* (Hook.) Bassett, poverty weed
- Jaumea carnosa* (Less.) A. Gray, Fleshy Jaumea, marsh jaumea, **L3**
- Lagophylla minor* (D.D. Keck) D.D. Keck, little hareleaf, lesser hareleaf
- Lagophylla ramosissima* Nutt., common hareleaf, branched lagophylla
- Lagophylla ramosissima* Nutt. subsp. *congesta* (Greene) D.D. Keck, clustered hareleaf, branched lagophylla
- Lagophylla ramosissima* Nutt. subsp. *ramosissima*, branched lagophylla, common hareleaf
- Lasthenia burkei* (Green) Green, goldfield **G1S1.1**
- Lasthenia californica* Lindl., California goldfields, common goldfields, Valley goldfields, goldfields
- Lasthenia conjugens* Greene, Contra Costa goldfields, **G1S1.1**
- Lasthenia glaberrima* A.DC., smooth goldfields
- Lasthenia glabrata* Lindl., Yellow-rayed Lasthenia, yellow-rayed goldfields, yellowray goldfields
- Lasthenia glabrata* Lindl. subsp. *glabrata*, yellowray goldfields, yellow-rayed goldfields
- Lasthenia microglossa* (A.DC.) E. Greene, Smallrayed lasthenia, small-rayed goldfields, smallray goldfields
- Layia chrysanthemoides* (DC.) A. Gray, smooth tidy-tips, smooth tidytips
- Layia gaillardioides* (Hook. & Arn.) DC., woodland layia, woodland tidytips
- Layia septentrionalis* D.D. Keck, Colusa tidytips, Colusa layia, **G2S2.2**
- Lessingia hololeuca* Greene, woolly-headed lessingia, woollyhead lessingia, **G3S3**
- Lessingia ramulosa* A. Gray, Sonoma lessingia
- Madia anomala* Greene, plumpseeded madia, plump-seeded madia, Tarweed
- Madia citriodora* Greene, lemon-scented tarweed, lemonscented madia
- Madia elegans* Lindl., common madia
- Madia elegans* Lindl. subsp. *densifolia* (Greene) D.D. Keck, leafy common madia, showy tarweed
- Madia elegans* Lindl. subsp. *vernalis* D.D. Keck, spring madia, Common Madia, spring common madia
- Madia exigua* (Sm.) A. Gray, meager tarweed, small tarweed, Little tarweed

- Madia gracilis* (Sm.) D.D. Keck, slender tarweed, Gumweed, grassy tarweed, Gumweed madia
- Madia sativa* Molina, coast tarweed, Chile Tarweed, Coastal Tarweed
- Malacothrix clevelandii* A. Gray, Cleveland's dandelion, Cleveland's desertydandelion, Cleveland's Malacothrix
- Malacothrix floccifera* (DC.) S.F. Blake, woolly dandelion, Woolly Malacothrix, woolly desertydandelion
- Micropus amphibolus* A. Gray, Mt. Diablo cottonweed, Mount Diablo cottonseed, **G3S3.2?**
- Micropus californicus* F.E. Fisch. & C.A. Mey., Micropus, Cotton Top, slender cottonweed, Q-tips, q tips
- Micropus californicus* F.E. Fisch. & C.A. Mey. var. *californicus*, q tips, slender cottonweed
- Microseris acuminata* Greene, Sierra foothills microseris, Needle microseris, Sierra foothill silverpuffs
- Microseris douglasii* (DC.) Sch. Bip., Douglas' microseris, Douglas' silverpuffs
- Microseris douglasii* (DC.) Sch. Bip. subsp. *douglasii*, Douglas' silverpuffs, Douglas' microseris
- Microseris douglasii* (DC.) Sch. Bip. subsp. *tenella* (A. Gray) K.L. Chambers, short-scaled microseris, Douglas' silverpuffs
- Microseris laciniata* (Hook.) Sch. Bip., cut-leaved scorzonella, cutleaf silverpuffs
- Microseris sylvatica* (Benth.) Sch. Bip., sylvan microseris, sylvan scorzonella, **G3S3.2**
- Monolopia major* DC., cupped monolopia
- Packera clevelandii* (Greene) W. A. Weber & Á. Löve, Cleveland's ragwort
- Packera eurycephala* (Torr. & A. Gray) W.A. Weber & Á. Löve, broadhead ragwort, Cut-leaved butterweed
- Packera greenii* (A. Gray) W. A. Weber & Á. Löve, Green Bay Packers Plant, serpentine ragwort
- Pentachaeta alsinoides* Greene, tiny pygmy-daisy, tiny pygmydaisy
- Pentachaeta exilis* (A. Gray) A. Gray, slender pentachaeta, meager pygmydaisy
- Pentachaeta exilis* (A. Gray) A. Gray subsp. *exilis*, meager pygmydaisy, slender pentachaeta
- Petasites frigidus* (L.) Fries var. *palmatus* (Ait.) Cronq., arctic sweet coltsfoot, coltsfoot, Western Coltsfoot
- Psilocarphus brevissimus* Nutt., woolly marbles, short woollyheads
- Psilocarphus brevissimus* Nutt. var. *brevissimus*, short woollyheads, woolly marbles, Woolly Heads
- Psilocarphus oregonus* Nutt., Oregon woollyheads, Oregon woolly marbles, Woolly marbles
- Psilocarphus tenellus* Nutt., slender woolly marbles, Woolly Marbles, slender woollyheads, Woolly-heads, Slender Woolly-heads
- Psilocarphus tenellus* Nutt. var. *tenellus*, slender woolly marbles, slender woollyheads, Woolly Marbles, slender woolly-heads
- Pyrrocoma racemosa* (Nutt.) Torr. & A. Gray, racemose pyrrocoma, clustered goldenweed
- Pyrrocoma racemosa* (Nutt.) Torr. & A. Gray var. *paniculata* (Nutt.) Kartesz & Gandhi, panicked pyrrocoma, clustered goldenweed, **LH?**
- Pyrrocoma racemosa* (Nutt.) Torr. & A. Gray var. *racemosa*, clustered goldenweed, racemose pyrrocoma
- Rafinesquia californica* Nutt., California plumseed, California chicory
- Rigiopappus leptocladus* A. Gray, Rigiopappus, wire-weed, wireweed
- Senecio aronicoides* DC., rayless ragwort, Groundsel, California butterweed, California rayless butterweed, Butterweed, California groundsel
- Senecio clevelandii* Greene var. *clevelandii*, Cleveland's ragwort, **G4?T3QS3.3**
- Senecio flaccidus* Less., threadleaf ragwort, shrubby ragwort
- Senecio flaccidus* Less. var. *douglasii* (DC.) B. Turner & T.M. Barkley, Douglas' groundsel, Shrubby Butterweed, Bush senecio, Douglas' shrubby ragwort, Douglas' ragwort, bush groundsel
- Senecio hydrophilus* Nutt., water groundsel, water ragwort, Alkali-Marsh Ragwort
- Senecio integerrimus* Nutt., lambstongue ragwort, mountain butterweed
- Senecio integerrimus* Nutt. var. *exaltatus* (Nutt.) Cronq., Columbia ragwort, Groundsel, Columbia mountain butterweed, **LH?**
- Solidago californica* Nutt., California goldenrod, oreja de liebre

- Solidago spathulata* DC. subsp. *spathulata*,
Dune Goldenrod, Dune goldenrod, coast
goldenrod
- Stebbinsoseris heterocarpa* (Nutt.) K.L.
Chambers, grassland stebbinsoseris
- Stephanomeria elata* Nutt., Annual Mitra,
Santa Barbara wirelettuce, Santa Barbara
stephanomeria
- Stephanomeria exigua* Nutt., small wirelettuce
- Stephanomeria exigua* Nutt. subsp. *coronaria*
(Greene) Gottlieb, milk-aster, white-
plume wirelettuce, whiteplume
wirelettuce
- Stephanomeria virgata* Benth., virgate
stephanomeria, Tall stephanomeria, rod
wirelettuce, Twiggy wreath plant
- Stephanomeria virgata* Benth. subsp.
pleurocarpa (Greene) Gottlieb, wand
wirelettuce, wand stephanomeria, Tall
Stephanomeria
- Stephanomeria virgata* Benth. subsp. *virgata*,
virgate stephanomeria, tall milk-aster, rod
wirelettuce, **LH?**
- Uropappus lindleyi* (DC.) Nutt., Uropappus,
silver puffs
- Wyethia angustifolia* (DC.) Nutt., Narrow-leaf
Mule-ears, Narrowleaf mule ears,
California compassplant, narrow-leaved
mule-ears
- Wyethia glabra* A. Gray, Shining mule ears,
smooth mule-ears, Coast Range mule-ears
- Wyethia helenioides* (DC.) Nutt., whitehead
wyethia, Gray mule ears, whitehead mule-
ears
- Wyethia mollis* A. Gray, Mule-ears, mountain
mule-ears, Woolly Mule's-Ears, Mountain
mule ears, woolly mule-ears, **LH?**
- Xanthium spinosum* L., spiny clotbur, spiny
cocklebur, spiny cocklebur
- Xanthium strumarium* L., rough cocklebur,
cocklebur

Berberidaceae

- Berberis aquifolium* Pursh, Oregon grape,
Mountaingrape, mountain grape
- Berberis aquifolium* Pursh var. *dictyota* (Jeps.)
Jeps., Shining netvein barberry, Jepson's
Oregon grape
- Berberis nervosa* Pursh, Oregon grape,
Cascades Oregon grape, Oregon grape

- Berberis pinnata* Lag., Coast Barberry, California
barberry, shiny-leaf mahonia
- Vancouveria hexandra* (Hook.) C. Morren &
Decne., northern vancouveria, Deciduous
vancouveria, white insideout flower
- Vancouveria planipetala* Calloni, inside-out
flower, redwood insideout flower, redwood
ivy

Betulaceae

- Alnus rhombifolia* Nutt., white alder
- Corylus cornuta* Marsh. var. *californica* (A. DC.)
W.M. Sharp, California Hazel, California
hazelnut

Boraginaceae

- Amsinckia eastwoodiae* J.F. Macbr., Eastwood's
fiddleneck
- Amsinckia lunaris* J.F. Macbr., bent-flowered
fiddleneck, bentflower fiddleneck, **G2S2.2**
- Amsinckia lycopsoides* Lehm., tarweed fiddleneck,
Bugloss fiddleneck
- Amsinckia menziesii* (Lehm.) A. Nelson & J.F.
Macbr., Menzies' fiddleneck, small-flowered
fiddleneck, Menzie's fiddleneck, Fiddleneck
- Amsinckia menziesii* (Lehm.) A. Nelson & J.F.
Macbr. var. *intermedia* (F.E. Fisch. & C.A.
Mey.) Ganders, common fiddleneck,
Fiddleneck, orange-flowered Menzies'
fiddleneck
- Amsinckia menziesii* (Lehm.) A. Nelson & J.F.
Macbr. var. *menziesii*, Rigid Fiddleneck,
Menzies' fiddleneck, Small-Flowered
Fiddleneck
- Cryptantha clevelandii* Greene, Cleveland's
cryptantha, common cryptantha
- Cryptantha clevelandii* Greene var. *dissita* (I.M.
Johnst.) Jeps. & Hoover, serpentine
cryptantha, Cleveland's cryptantha, **G5T1S1.1**
- Cryptantha flaccida* (Lehm.) Greene, flaccid
cryptantha, Beaked cryptantha, weakstem
cryptantha
- Cryptantha hispidula* Brand, Napa cryptantha
- Cryptantha intermedia* (A. Gray) Greene,
Clearwater cryptantha, common cryptantha,
Common cryptanth
- Cryptantha microstachys* (A. Gray) Greene,
Popcorn Flower, Tejon cryptantha
- Cryptantha muricata* (Hook. & Arn.) A. Nelson &
J.F. Macbr., Prickly Popcorn Flower, pointed
cryptantha, prickly cryptantha

Cryptantha nemaclada Greene, Colusa cryptantha
Cryptantha torreyana (A. Gray) Greene, Torrey's Cryptantha
Cynoglossum grande Lehm., Western houndstongue, Western Hound's Tongue, grand hound's tongue, Pacific hound's tongue, Houndstongue
Heliotropium curassavicum L., Heliotrope, seaside heliotrope, Chinese Parsley, salt heliotrope
Pectocarya penicillata (Hook. & Arn.) A. DC., sleeping combseed, winged combseed, winged pectocarya
Pectocarya pusilla (A. DC.) A. Gray, Pectocarya, little combseed, Little Pectocarya
Plagiobothrys bracteatus (Howell) I.M. Johnst., bracted popcornflower, bracted popcorn flower, Bracted Allocarya
Plagiobothrys canescens Benth., Valley Popcorn Flower, grey popcorn flower, valley popcorn, valley popcornflower, **L3**
Plagiobothrys cusickii (Greene) I.M. Johnst., Cusick's popcorn flower, **LH?**
Plagiobothrys fulvus (Hook. & Arn.) I.M. Johnst., Common popcorn flower, fulvous popcorn flower, fulvous popcornflower
Plagiobothrys fulvus (Hook. & Arn.) I.M. Johnst. var. *campestris* (Greene) I.M. Johnst., fulvous popcornflower, tawny popcorn flower, Common popcorn flower
Plagiobothrys greenii (A. Gray) I. M. Johnst., Greene's allocarya, Greene's popcornflower
Plagiobothrys nothofulvus (A. Gray) A. Gray, rusty popcornflower, Rusty popcorn flower, Popcorn Flower, rusty-haired popcorn flower
Plagiobothrys stipitatus (Greene) I.M. Johnst., stalked popcornflower, vernal pool allocarya
Plagiobothrys stipitatus (Greene) I.M. Johnst. var. *micranthus* (Piper) I.M. Johnst. common vernal pool allocarya, stalked popcornflower
Plagiobothrys stipitatus (Greene) I.M. Johnst. var. *stipitatus*, vernal pool allocarya, stalked popcornflower

Plagiobothrys strictus (Greene) I.M. Johnst., Calistoga popcornflower, Calistoga popcornflower, **G1S1.1**
Plagiobothrys tenellus (Nutt.) A. Gray, Popcorn flower, Pacific popcornflower, slender popcorn flower
Plagiobothrys tener (Greene) I.M. Johnst., slender popcornflower, Slender popcorn flower, slender allocarya

BRASSICACEAE

Arabis breweri S. Watson, Brewer's rock-cress, Brewer's rockcress
Arabis breweri S. Watson var. *breweri*, Brewer's rock-cress, Brewer's rockcress
Arabis glabra (L.) Bernh., towermustard rockcress, tower mustard, smooth rock-cress
Arabis glabra (L.) Bernh. var. *glabra*, Tower-Mustard, smooth rock-cress
Arabis modesta Rollins, modest rock cress, **G3QS3.3?**
Arabis oregana Rollins, Oregon rockcress, Oregon rock cress, **G3G4QS3.3?**
Arabis sparsiflora Torr. & A. Gray var. *arcuata* (Nutt) Rollins, Elegant rock-cress, arched rock-cress, elegant rockcress
Athysanus pusillus (Hook.) Greene, common sandweed, dwarf athysanus, Athysanus
Barbarea orthoceras Ledeb., American Wintercress, American rocket, erectpod wintercress, winter-cress, **L2**
Cardamine californica (Torr. & A. Gray) Greene, milk maids, California Toothwort, California Toothwort, Milk Maids, Bitter cress
Cardamine californica (Torr. & A. Gray) Greene var. *californica*, milkmaids, California Toothwort, milk maids
Cardamine californica (Torr. & A. Gray) Greene var. *cardiophylla* (Greene) Rollins, milkmaids, milk maids
Cardamine californica (Torr. & A. Gray) Greene var. *integriolia* (Torr. & A. Gray) Rollins, milkmaids, Rain-bells, California Toothwort, milk maids
Cardamine californica (Torr. & A. Gray) Greene var. *sinuata* (Greene) O. Schulz, milkmaids, milk maids
Cardamine oligosperma Torr. & A. Gray, Bitter-cress, Idaho bittercress, bitter cress
Draba verna L., spring draba, Whitlowgrass, Whitlow grass

- Draba verna* L. var. *aestivalis* Lej., small-bruited spring draba
- Erysimum capitatum* (Douglas) Greene, sanddune wallflower, western wallflower, Wallflower
- Erysimum capitatum* (Douglas) Greene subsp. *capitatum*, western wallflower, Douglas' Wallflower
- Guillenia flavescens* (Hook.) Greene, yellow mustard, yellow California mustard
- Guillenia lasiophylla* (Hook. & Arn.) Greene, California mustard, Shaggy thelypod
- Hutchinsia procumbens* (L.) Desv., prostrate hutchinsia
- Idahoia scapigera* (Hook.) A. Nelson & J.F. Macbr., oldstem idahoia *Barbarea orthoceras* Ledeb., American Wintercress, American rocket, erectpod wintercress, winter-cress, **L3**
- Lepidium dictyotum* A. Gray, net pepper-grass, alkali pepperweed
- Lepidium dictyotum* A. Gray var. *acutidens* A. Gray, alkali pepperwort, net pepper-grass
- Lepidium latipes* Hook., San Diego pepperweed, dwarf peppergrass, dwarf pepper-grass
- Lepidium nitidum* Torr. & A. Gray, peppergrass, shining pepperweed, tongue grass, shining pepper-grass, Common peppergrass
- Lepidium nitidum* Torr. & A. Gray var. *nitidum*, shining peppergrass, shining pepperweed, shining pepper-grass
- Lepidium oxycarpum* Torr. & A. Gray, sharp-podded pepper-grass, forked pepperweed
- Lepidium strictum* (S. Watson) Rattan, prostrate pepper-grass, upright pepperweed, Peppergrass
- Lepidium virginicum* L., Virginia pepperweed, wild pepper-grass
- Rorippa curvisiliqua* (Hook.) Britton, Western Yellow-cress, Western yellow cress, curvepod yellowcress, Western Yellowcress, curvepod yellow-cress
- Rorippa nasturtium-aquaticum* (L.) Hayek, watercress, water cress, water-cress
- Rorippa palustris* (L.) Besser, bog yellowcress, bog yellow-cress
- Streptanthus barbiger* Greene, bearded jewel-flower, bearded jewelflower, **G3S3.2**
- Streptanthus brachiatus* F.W. Hoffmann, Socrates Mine jewelflower, **L3**
- Streptanthus brachiatus* F.W. Hoffmann subsp. *brachiatus*, Socrates Mine jewelflower, Socrates Mine jewel-flower, **G2T1S1.2**
- Streptanthus breweri* A. Gray, Brewer's jewelflower
- Streptanthus breweri* A. Gray var. *breweri*, Brewer's jewelflower
- Streptanthus breweri* A. Gray var. *hesperidis* (Jeps.) Jeps., green jewel-flower, Brewer's jewelflower, **G5T2S2.2**
- Streptanthus glandulosus* Hook., Tamalpais Jewel-flower, bristly jewelflower, jewelflower
- Streptanthus glandulosus* Hook. subsp. *glandulosus*, bristly jewelflower, jewelflower
- Streptanthus morrisonii* F.W. Hoffm., Morrison's jewelflower, **G2S2**
- Streptanthus morrisonii* F.W. Hoffm. subsp. *elatus* F.W. Hoffm., Three Peaks jewelflower, Three Peaks jewel-flower, **G2T2S2.2**
- Streptanthus morrisonii* F.W. Hoffm. subsp. *kruckebergii* R. Dolan & L. LaPre, Kruckeberg's jewel-flower, Krukeberg's jewelflower, **G2T1S1.2**
- Thelypodium brachycarpum* Torr., shortpod thelypody, short-podded thelypodium, **G3S3.2**
- Thysanocarpus curvipes* Hook., hairy lacepod, sand fringe-pod, Fringed Pod, Lace Pod, common fringe-pod, Fringe pod
- Thysanocarpus laciniatus* Torr. & A. Gray, Narrowleaf fringe pod, common lace-pod, Narrow-leaved Fringe Pod, Fringe Pod, mountain fringe-pod, narrow-leaved lacepod
- Thysanocarpus radians* Benth., showy fringe-pod, ribbed fringe-pod, Fringe pod
- Tropidocarpum gracile* Hook., Slender Keel Fruit, slender tropidocarpum, dobie pod

CALLITRICHACEAE

- Callitriche heterophylla* Pursh, varied-leaved water-starwort, Water Starwort, larger waterstarwort
- Callitriche heterophylla* Pursh var. *bolanderi* (Hegelm.) Fassett, Bolander's water-starwort
- Callitriche heterophylla* Pursh var. *heterophylla*, varied-leaved water-starwort
- Callitriche marginata* Torr., water starwort, California water starwort, winged water-starwort, waterstarwort

Callitriche verna L., vernal water-starwort,
Water Starwort

CALYCANTHACEAE

Calycanthus occidentalis Hook. & Arn.,
sweet-shrub, spicebush

CAMPANULACEAE

- Campanula angustiflora* Eastw., Eastwood's
harebell, Eastwood's bellflower
Campanula griffinii N. Morin, Griffin's
bellflower, Griffin's harebell
Campanula prenanthoides Durand, California
harebell, nodding harebell
Downingia bicornuta A. Gray var. *bicornuta*,
bristled downingia, doublehorn
calicoflower
Downingia concolor Greene, spotted-throat
downingia, maroonspot calicoflower
Downingia concolor Greene var. *concolor*,
maroonspot calicoflower, spotted-throat
downingia
Downingia cuspidata (Greene) Greene,
toothed calicoflower, toothed downingia
Downingia pulchella (Lindl.) Torr., flatface
calicoflower, flatface downingia
Downingia pusilla (Don) Torr., dwarf
downingia, dwarf calicoflower, **G3S3.1**
Githopsis diffusa A. Gray, San Gabriel
bluecup, Southern bluecup
Githopsis diffusa A. Gray subsp. *robusta* N.
Morin, San Gabriel bluecup
Githopsis specularioides Nutt., common
bluecup, Venus' looking glass
Heterocodon rariflorum Nutt., rareflower
heterocodon, few-flowered heterocodon,
Heterocodon
Legenere limosa (Greene) McVaugh, false
Venus' looking glass, legenere, **G2S2.2**
Nemacladus capillaris Greene, common
nemacladus, common threadplant
Nemacladus montanus Greene, mountain
nemacladus, mountain threadplant
Triodanis biflora (Ruiz & Pav.) Greene,
Venus' looking glass, Venus looking-glass

CAPRIFOLIACEAE

Lonicera hispidula Douglas var. *vacillans* A.
Gray, hairy honeysuckle, California
honeysuckle, pink honeysuckle

Lonicera interrupta Benth., chaparral honeysuckle
Sambucus mexicana C. Presl, blue elderberry,
elderberry

Symphoricarpos albus (L.) S.F. Blake var.
laevigatus (Fernald) S.F. Blake, snowberry,
Upright snowberry, common snowberry
Symphoricarpos mollis Nutt., creeping snowberry,
Trailing Snowberry, snowberry
Viburnum ellipticum Hook., oval-leaved viburnum,
common viburnum, Viburnum, **G5S2.3**

CARYOPHYLLACEAE

- Minuartia californica* (A. Gray) J. Mattfield,
California sandwort, Sandwort
Minuartia douglasii (Torr. & A. Gray) J. Mattfield,
Sandwort, Douglas' sandwort, Douglas'
stitchwort
Sagina apetala Ard., annual pearlwort, Sticky
Pearlwort, dwarf pearlwort
Sagina decumbens (J.E. Elliott) Torr. & A. Gray
subsp. *occidentalis* (S. Watson) G.E. Crow,
western pearlwort
Silene antirrhina L., sleepy silene, sleepy catchfly,
snapdragon campion, Sleepy Catch-fly
Silene californica Durand, California Indian pink,
Indian pink, California scarlet campion
Silene coniflora Nees ex Oth, fire-following
campion, manynerve catchfly
Silene lemmonii S. Watson, Lemmon campion,
Lemmon's catchfly, **L1**
Silene verecunda S. Watson subsp. *platyota* (S.
Watson) C.L. Hitchc. & Maguire, San
Francisco campion
Spergularia macrotheca (Hornem.) Heynh., Large-
flowered Sand Spurry, sticky sandspurry, Sand
Spurry, sticky sand-spurry
Spergularia macrotheca (Hornem.) Heynh. var.
leucantha (Greene) B.L. Rob., white sticky
sand-spurry, sticky sandspurry
Spergularia macrotheca (Hornem.) Heynh. var.
longistyla R. Rossbach, sticky sandspurry,
long-styled sand-spurrey
Spergularia marina (L.) Griseb., Sand Spurry,
Saltmarsh spurry, salt marsh sand spurrey, Salt
Marsh Sand Spurry, salt sand-spurry
Stellaria nitens Nutt., shining chickweed, Smooth
chickweed, shiny chickweed

CELASTRACEAE

Paxistima myrsinites (Pursh) Raf., Oregon
boxwood, Oregon boxleaf, **L3**

CHENOPODIACEAE

- Atriplex joaquiniana* A. Nelson, San Joaquin spearscale, San Joaquin saltbush, San Joaquin orache, **G2S2.1**
- Atriplex triangularis* Willd., spear-leaved saltbrush, spearscale orache, Fat Hen, spearscale
- Monolepis nuttalliana* (Schultes) Greene, Nuttall's poverty weed, Nuttall's povertyweed
- Salicornia virginica* L., pickleweed, Virginia glasswort, salt marsh pickleweed

CISTACEAE

- Helianthemum scoparium* Nutt., common sun-rose, Peak Rush-rose, rushrose, Bisbee Peak rushrose, Broom-rose

CONVOLVULACEAE

- Calystegia collina* (Greene) Brummitt, hillside morning-glory, coast range false bindweed
- Calystegia collina* (Greene) Brummitt subsp. *collina*, coast range false bindweed, hillside morning-glory
- Calystegia collina* (Greene) Brummitt subsp. *oxyphylla* Brummitt, Mount Saint Helena morning-glory, Mt. Saint Helena morning-glory, **G4T3S3.2**
- Calystegia malacophylla* (Greene) Munz, Sierra false bindweed, Woolly morningglory, Sierra morning-glory, morning-glory, **LH?**
- Calystegia malacophylla* (Greene) Munz subsp. *malacophylla*, Sierra morning-glory, Sierra false bindweed
- Calystegia occidentalis* (A. Gray) Brummitt, chaparral false bindweed, western morning-glory, bush morning-glory
- Calystegia purpurata* (Greene) Brummitt, Morning-glory, smooth western morning-glory, Pacific false bindweed
- Calystegia purpurata* (Greene) Brummitt subsp. *purpurata*, Morning-glory, Purple Western Morning-glory, smooth western morning-glory, Pacific false bindweed
- Calystegia subacaulis* Hook. & Arn., Stemless morningglory, Morning-glory, hill morning-glory, hillside false bindweed
- Cressa truxillensis* Kunth, alkali weed, spreading alkaliweed

- Dichondra donelliana* Tharp & M.C. Johnst., dichondra, California ponysfoot, **L3**

CORNACEAE

- Cornus glabrata* Benth., brown dogwood
- Cornus nuttallii* Audubon, Pacific dogwood, Pacific mountain dogwood, Mountain Dogwood
- Cornus sericea* L., Creek Dogwood, American dogwood, redosier dogwood
- Cornus sericea* L. subsp. *occidentalis* (Torr. & A. Gray) Fosb., western dogwood
- Cornus sericea* L. subsp. *sericea*, Creek Dogwood, redosier dogwood, American Dogwood, red osier dogwood

CRASSULACEAE

- Crassula aquatica* (L.) Schonl., Pigmy-weed, water pygmyweed, aquatic pygmy-weed
- Crassula connata* Ruiz & Pav., pygmy weed, Pigmy-weed, pygmy-weed, sand pygmyweed, Sand Pygmy-weed
- Dudleya caespitosa* (Haw.) Britton & Rose, Coast Dudleya, Sand Lettuce, **L2**
- Dudleya cymosa* (Lemaire) Britton & Rose, canyon dudleya, canyon liveforever, Rock Lettuce
- Dudleya setchellii* (Jeps.) Britton & Rose, Santa Clara Valley liveforever, Santa Clara Valley dudleya, **G1S1.1**
- Parvisedum pumilum* (Benth.) R.T. Clausen, Sierra stonecrop
- Sedum radiatum* S. Watson, Coast Range stonecrop
- Sedum spathulifolium* Hook., yellow stonecrop, broadleaf stonecrop, Stone-crop, Pacific stonecrop

CUCURBITACEAE

- Marah fabaceus* (Naudin) Greene, wild-cucumber, Coast wild cucumber, California manroot, Manroot
- Marah fabaceus* (Naudin) Greene var. *agrestis* (Greene) K.M. Stocking, wild-cucumber, California manroot
- Marah oreganus* (Torr. & A. Gray) Howell, Wild Cucumber, coastal manroot, coast wild-cucumber, Manroot
- Marah watsonii* (Cogn.) Greene, Manroot, Watson's wild-cucumber, taw manroot

CUSCUTACEAE

- Cuscuta californica* Hook. & Arn., chaparral dodder, California dodder
Cuscuta californica Hook. & Arn. var. *breviflora* Engelm., San Joaquin Dodder, chaparral dodder, California dodder
Cuscuta indecora Choisy, big-seed alfalfa dodder, bigseed alfalfa dodder
Cuscuta pentagona Engelm., five-angled dodder, fiveangled dodder, western field dodder
Cuscuta salina Engelm., saltmarsh dodder
Cuscuta subinclusa Durand & Hilg., canyon dodder

CYPERACEAE

- Bolboschoenus robustus* (Pursh) Soják, big bulrush, Bull tule
Carex amplifolia Boott, big-leaf sedge, Ample-leaved Sedge, bigleaf sedge
Carex aquatilis Wahlenb., water sedge, water-sedge
Carex barbara Dewey, valley sedge, Santa Barbara sedge
Carex bolanderi Olney, Bolander's sedge
Carex brainerdii Mack., Brainerd's sedge, **L1**
Carex densa L.H. Baily, dense sedge, Sedge
Carex deweyana Schwein. subsp. *leptopoda* (Mack.) Calder & Roy L. Taylor, Shorter scaled sedge, Dewey's taper-fruit sedge
Carex dudleyi Mack., Dudley's sedge
Carex feta L.H. Bailey, greensheath sedge, Green-sheathed Sedge, feta sedge
Carex globosa Boott, round-fruit sedge, roundfruit sedge, round-fruited sedge
Carex gracilior Mack., slender sedge
Carex multicaulis L.H. Bailey, Many-Stemmed Sedge, forest sedge, manystem sedge
Carex nudata W. Boott, Dudley's sedge, torrent sedge, naked sedge
Carex praegracilis W. Boott, clustered field sedge, Field sedge
Carex senta Boott, swamp carex, swamp sedge, rough sedge
Carex serratodens W. Boott, two-tooth sedge, Bifid Sedge, twotooth sedge
Carex subbracteata Mack., Small-bracted Sedge, small-bract sedge
Carex subfusca W. Boott, Rusty Slender Sedge, brown sedge

- Carex tumulicola* Mack., foothill sedge, split-awn sedge, slender sedge
Cyperus eragrostis Lam., tall flatsedge, Tall Cyperus
Cyperus erythrorhizos Muhlenb., Red-rooted cyperus, redroot flatsedge
Cyperus niger Ruiz & Pav., Black Cyperus, Brown cyperus, black flatsedge
Cyperus squarrosus L., bearded flatsedge, Umbrella Sedge, Awned Cyperus
Eleocharis acicularis (L.) Roem. & Schult., Spike-rush, Needle Spike-rush, needle spikerush
Eleocharis acicularis (L.) Roem. & Schult. var. *bella* Piper, Beautiful Spike-Rush, beautiful spikerush
Eleocharis engelmannii Steud., Engelmann's spikerush
Eleocharis macrostachya Britton, common spikerush, Creeping spike rush, Pale Spike-Rush, pale spikerush, Wire Grass, Spike-rush
Eleocharis montevidensis Kunth, sand spikerush, Montevideo spike rush
Eleocharis parvula (Roem. & Schult.) Link, small spikerush, dwarf spikerush, **G5S3.3**
Eleocharis radicans (Poir.) Kunth, creeping spikerush, rooted spikerush
Isolepis carinata Hook. & Arn., keeled bulrush
Isolepis cernua (Vahl) Roem. & Schult., annual tule, low clubrush
Lipocarpa micrantha (Vahl) G.C. Tucker, small-flowered hemicarpha, smallflower halfchaff sedge
Rhynchospora californica Gale, California beaked-rush, **G1S1.1**
Schoenoplectus acutus (Muhl. ex Bigelow) Á. Löve & D. Löve var. *occidentalis* (S. Watson) S. G. Sm., tule, Common Tule, Viscid bulrush, western common tule, Hard-Stemmed Tule
Schoenoplectus americanus (Pers) Volkart ex Schinz & R. Keller, Olney's bulrush, bulrush, American tule
Schoenoplectus californicus (C. A. Mey.) Soják, California bulrush, California tule
Schoenoplectus fluviatilis (Torr.) M. T. Strong, river bulrush
Schoenoplectus pungens (Vahl) Palla, three-square
Schoenoplectus tabernaemontani (C. C. Gmel.) Palla, tule, American great bulrush, mountain bulrush
Scirpus microcarpus C. Presl, paniced bulrush, Small-Fruited Bulrush, mountain bog bulrush

DATISACEAE

Datisca glomerata (C. Presl) Baillon, Durango root

ELATINACEAE

Bergia texana (Hook.) Seub., Texas bergia, **L3**

Elatine brachysperma A. Gray, short-seed waterwort, shortseed waterwort

ERICACEAE

Allotropa virgata A. Gray, sugar-stick,

Sugarstick, candystriped allotropa

Arbutus menziesii Pursh, madrone, madrono, Pacific madrone

Arctostaphylos canescens Eastw., hoary manzanita

Arctostaphylos canescens Eastw. subsp. *canescens*, hoary manzanita

Arctostaphylos canescens Eastw. subsp. *sonomensis* (Eastw.) P.V. Wells, Rincon manzanita, Sonoma manzanita

Arctostaphylos columbiana Piper, redwood manzanita, hairy manzanita

Arctostaphylos glandulosa Eastw., Eastwood manzanita, Eastwood's manzanita

Arctostaphylos glandulosa Eastw. subsp. *glandulosa*, Eastwood manzanita, Eastwood's manzanita

Arctostaphylos manzanita Parry, Common manzanita, whiteleaf manzanita

Arctostaphylos manzanita Parry subsp. *elegans* (Jeps.) P.V. Wells, Konocti common manzanita, Konocti manzanita, **G5T2S2.3**

Arctostaphylos manzanita Parry subsp. *manzanita*, whiteleaf manzanita, common manzanita

Arctostaphylos stanfordiana Parry, Stanford's manzanita

Arctostaphylos stanfordiana Parry subsp. *stanfordiana*, Stanford manzanita, Stanford's manzanita

Arctostaphylos tomentosa (Pursh) Lindl., woolly-leaf manzanita, woollyleaf manzanita

Arctostaphylos tomentosa (Pursh) Lindl. subsp. *crustacea* (Eastw.) P.V. Wells, brittle-leaf manzanita, brittleleaf manzanita

Arctostaphylos viscida Parry, whiteleaf manzanita, sticky whiteleaf manzanita

Arctostaphylos viscida Parry subsp. *pulchella* (Howell) P.V. Wells, white-leaf manzanita, sticky whiteleaf manzanita

Arctostaphylos viscida Parry subsp. *viscida*, smooth white-leaf manzanita, sticky whiteleaf manzanita, **LH?**

Chimaphila menziesii (D. Don) Spreng., pipsissewa, Little Prince's-Pine, little prince's pine, **L1**

Pityopus californicus (Eastw.) H.F. Copel., California pinefoot, Pityopus, **G4G5S3.2**

Pyrola picta Sm., white-veined wintergreen, Wintergreen, Whitevein shinleaf, White-veined shinleaf

Rhododendron occidentale (Torr. & A. Gray) A. Gray, western azalea

Vaccinium ovatum Pursh, Huckleberry, California huckleberry, evergreen huckleberry

EUPHORBIACEAE

Chamaesyce ocellata (Durand & Hilg.) Millsp. subsp. *ocellata*, Contura Creek sandmat

Chamaesyce serpyllifolia (Pers.) Small, thyme-leafed spurge, thymeleaf sandmat

Eremocarpus setigerus (Hook.) Benth., Turkey Mullein, Dove Weed, doveweed, Turkey-Mullein, turkey mullein

Euphorbia crenulata Engelm., Chinese caps, Chinesecaps

Euphorbia spathulata Lam., warty spurge, Spurge, Reticulate seeded spurge

FABACEAE

Amorpha californica Nutt., California false-indigo, mock locust, False indigo

Amorpha californica Nutt. var. *napensis* Jeps., Napa false-indigo, Napa false indigo, Indigo bush, **G4T2S2.2**

Astragalus breweri A. Gray, Brewer's milkvetch, Brewer's milk-vetch, **G3S3.2**

Astragalus claranus Jeps., Clara Hunt's milk-vetch, Clara Hunt's milkvetch, **G1S1.1**

Astragalus clevelandii Greene, Cleveland's milk-vetch, Cleveland's milkvetch, **G3S3.3?**

Astragalus gambelianus E. Sheldon, Gambel's dwarf milk-vetch, Gambel's dwarf milkvetch, Dwarf Loco Weed, Gambel's locoweed, Loco Weed

Astragalus rattanii A. Gray, Rattan's milk-vetch, Rattan's milkvetch

- Astragalus rattanii* A. Gray var. *jepsonianus* Barneby, Jepson's milk-vetch, Jepson's milkvetch,, **G4T2S2.2**
- Astragalus tener* A. Gray, alkali milk-vetch, alkali milkvetch
- Astragalus tener* A. Gray var. *tener*, alkali milk-vetch, alkali milkvetch, **G1T1S1.1**
- Cercis occidentalis* Torr., Redbud, western redbud
- Glycyrrhiza lepidota* Pursh, wild licorice, American licorice, Lichorice
- Hoita macrostachya* (DC.) Rydb., leather root, large leather-root, California Hemp
- Hoita orbicularis* (Lindl.) Rydb., Round-leaved Psoralea, creeping leather root, roundleaf leather-root
- Lathyrus jepsonii* Greene, Jepson's Pea, Delta tulle pea, tulle pea
- Lathyrus jepsonii* Greene var. *californicus* (S. Watson) Hoover, California tulle pea
- Lathyrus jepsonii* Greene var. *jepsonii*, Delta tulle pea, **G5T2S2.2**
- Lathyrus nevadensis* S. Watson var. *nevadensis*, Sierra Pea, Sierra Nevada pea
- Lathyrus torreyi* A. Gray, redwood pea, Torrey's pea
- Lathyrus vestitus* Nutt., Pacific pea, Bolander's Pea, common Pacific pea
- Lathyrus vestitus* Nutt. var. *vestitus*, wild sweetpea, common Pacific pea, Hillside Pea
- Lotus crassifolius* (Benth.) Greene, Buck Lotus, big deervetch, broad-leaved lotus
- Lotus crassifolius* (Benth.) Greene var. *crassifolius*, big deervetch, broad-leaved lotus
- Lotus grandiflorus* (Benth.) Greene, chaparral bird's-foot trefoil, chaparral lotus, Large-leaved lotus
- Lotus grandiflorus* (Benth.) Greene var. *grandiflorus*, chaparral bird's-foot trefoil, chaparral lotus
- Lotus humistratus* Greene, Short-podded Lotus or Colchita, Hill Lotus, Bird's foot lotus, foothill deervetch, short-podded lotus
- Lotus micranthus* Benth., small-flowered lotus, Small Flowered Trefoil, Smallflower lotus, desert deervetch, SanDiego lotus, Hill Lotus
- Lotus oblongifolius* (Benth.) Greene, Streambank Lotus, streambank bird's-foot trefoil, narrow-leaved lotus
- Lotus oblongifolius* (Benth.) Greene var. *oblongifolius*, narrow-leaved lotus, streambank bird's-foot trefoil
- Lotus pinnatus* Hook., pinnate-leaved lotus, meadow bird's-foot trefoil, Pinnate lotus, **L3**
- Lotus purshianus* (Benth.) Clem. & E.G. Clem. var. *purshianus*, Spanish clover, Spanish Lotus
- Lotus scoparius* (Nutt.) Ottley, deerweed, common deerweed
- Lotus stipularis* (Benth.) Greene var. *stipularis*, Balsam lotus, balsam bird's-foot trefoil, stipulate lotus
- Lotus strigosus* (Nutt.) Greene, Bishop's lotus, Hairy Lotus, strigose bird's-foot trefoil, strigose lotus
- Lotus wrangelianus* F.E. Fisch. & C.A. Mey., Chilean bird's-foot trefoil, Chilean lotus, Calf lotus, Chile lotus, Chilean trefoil
- Lupinus affinis* J. Agardh, fleshy lupine
- Lupinus albicaulis* Hook., Sickle-keeled Lupine, sicklekeel lupine, white-stemmed lupine, **LH?**
- Lupinus albifrons* Benth., Silver lupine, silver bush lupine
- Lupinus albifrons* Benth. var. *albifrons*, silver lupine, silver bush lupine
- Lupinus albifrons* Benth. var. *collinus* Greene, silver bush lupine, silver lupine
- Lupinus bicolor* Lindl., miniature lupine, Bicolored lupine, Annual Lupine, Lupine
- Lupinus formosus* Greene, Lupine, summer lupine, western lupine
- Lupinus formosus* Greene var. *formosus*, summer lupine, western lupine
- Lupinus formosus* Greene var. *robustus* C.P. Sm., summer lupine, giant western lupine
- Lupinus latifolius* J. Agardh, broadleaf lupine, broad-leaf lupine, Bigleaf lupine
- Lupinus latifolius* J. Agardh var. *latifolius*, broad-leaf lupine
- Lupinus luteolus* Kellogg, butter lupine, pale yellow lupine
- Lupinus microcarpus* Sims, chick lupine
- Lupinus microcarpus* Sims var. *densiflorus* (Benth.) Jeps., Dense-flowered Platycarpus, chick lupine
- Lupinus microcarpus* Sims var. *microcarpus*, Valley lupine, chick lupine

- Lupinus nanus* Benth., sky lupine, Valley sky lupine
- Lupinus pachylobus* Greene, Fatpod lupine, Mt. Diablo lupine, big-pod lupine
- Lupinus polyphyllus* Lindl., meadow-lupine, bigleaf lupine, Bog Lupine
- Lupinus polyphyllus* Lindl. var. *polyphyllus*, meadow-lupine
- Lupinus sericatus* Kellogg, Cobb Mtn. lupine, Cobb Mountain lupine, **G2S2.2**
- Lupinus succulentus* Koch, succulent lupine, arroyo lupine, hollowleaf annual lupine
- Pickeringia montana* Nutt., chaparral pea, Montana chaparral pea
- Pickeringia montana* Nutt. var. *montana*, Montana chaparral pea, chaparral pea
- Rupertia physodes* (Hook.) J.W. Grimes, common rupertia, California tea, forest scurfpea
- Thermopsis macrophylla* Hook. & Arn., Santa Inez goldenbanner, common false lupine, Santa Ynez false lupine, California false lupine, **G1S1.3**
- Thermopsis macrophylla* Hook. & Arn. var. *macrophylla*, common false lupine
- Trifolium albopurpureum* Torr. & A. Gray, rancheria clover, Indian clover
- Trifolium albopurpureum* Torr. & A. Gray var. *albopurpureum*, Indian clover
- Trifolium albopurpureum* Torr. & A. Gray var. *dichotomum* (Hook. & Arn.) Isely, branched Indian clover, Clover
- Trifolium albopurpureum* Torr. & A. Gray var. *olivaceum* (Greene) Isely, olive clover, Owl's clover
- Trifolium amoenum* Greene, showy Indian clover, **G1S1.1**
- Trifolium barbigerum* Torr. var. *barbigerum*, bearded clover
- Trifolium bifidum* A. Gray, Pinole clover, notch-leaf clover, notchleaf clover
- Trifolium bifidum* A. Gray var. *bifidum*, Pinole clover
- Trifolium bifidum* A. Gray var. *decipiens* Greene, notch-leaf clover
- Trifolium ciliolatum* Benth., foothill clover, Tree clover
- Trifolium depauperatum* Desv., Pale Sack Clover, cowbag clover, dwarf sack clover
- Trifolium depauperatum* Desv. var. *amplectens* (Torr. & A. Gray) McDermott, pale bladder clover, balloon sack clover, Clover, Pale Sack Clover
- Trifolium depauperatum* Desv. var. *depauperatum*, dwarf sack clover, cowbag clover, dwarf bladder clover
- Trifolium depauperatum* Desv. var. *hydrophilum* (Greene) Isely, saline clover, water sack clover, **G5T2?S2.2?**
- Trifolium depauperatum* Desv. var. *truncatum* (Greene) Isely, dwarf sack clover
- Trifolium fucatum* Lindl., Sour Clover, bull clover
- Trifolium gracilentum* Torr. & A. Gray, pinpoint clover, graceful clover, Pin-point Clover
- Trifolium gracilentum* Torr. & A. Gray var. *gracilentum*, pinpoint clover, pin-point clover
- Trifolium microcephalum* Pursh, Maiden clover, Hairy Clover, small-head field clover, smallhead clover, small-headed clover, Small-head clover
- Trifolium microdon* Hook. & Arn., Valparaiso clover, thimble clover, Valparaiso
- Trifolium obtusiflorum* Hook. & Arn., clammy clover, Creek Clover
- Trifolium oliganthum* Steud., few-flowered clover, fewflower clover, Minitomcat clover
- Trifolium variegatum* Nutt., white-tipped clover, whitetip clover, variegated clover
- Trifolium willdenovii* Spreng., tomcat clover
- Trifolium wormskioldii* Lehm., cows clover, coast clover, springbank clover, cow clover
- Vicia americana* Willd. var. *americana*, American vetch, Vetch
- Vicia hassei* S. Watson, Hasse's vetch

FAGACEAE

- Chrysolepis chrysophylla* (Hook.) Hjelmq., Giant chinquapin, Chinquapin, golden chinquapin
- Chrysolepis chrysophylla* (Hook.) Hjelmq. var. *minor* (Benth.) Munz, giant chinquapin, bush chinquapin
- Lithocarpus densiflorus* (Hook. & Arn.) Rehder, tanoak, Tanbark Oak
- Quercus agrifolia* Nee, coast live oak, California live oak
- Quercus agrifolia* Nee var. *agrifolia*, coast live oak, California live oak
- Quercus berberidifolia* Liebm., scrub oak, inland scrub oak

- Quercus chrysolepis* Liebm., canyon live oak,
gold-cup oak, Canyon Oak, Maul Oak,
Goldcup Oak, Gold-cup Live Oak
Quercus chrysolepis Liebm. var. *nana* (Jeps.)
Jeps., canyon live oak
Quercus douglasii Hook. & Arn., blue oak
Quercus dumosa Nutt., Nuttall's scrub oak,
coastal sage scrub oak, scrub oak, **G2S1.1**
Quercus durata Jeps., leather oak
Quercus garryana Hook., Garry's oak, Oregon
white oak, Oregon oak, garry oak, Oregon
oak
Quercus garryana Hook. var. *breweri*
(Engelm.) Jepson, Garry's oak, Oregon
white oak, Brewer's oak, oregon oak
Quercus garryana Hook. var. *garryana*,
Oregon white oak, Oregon oak
Quercus kelloggii Newb., Black oak,
California black oak
Quercus lobata Nee, Valley oak, California
white oak
Quercus wislizeni A. DC., interior live oak,
Interior Live Oak, Chapparal Oak
Quercus wislizeni A. DC. var. *frutescens*
Engelm., interior live oak, bush interior
live oak, Chapparal Oak, Live oak
Quercus wislizeni A. DC. var. *wislizeni*,
interior live oak

FRANKENIACEAE

- Frankenia salina* (Molina) I.M. Johnst., alkali
heath, Yerba Reuma, Alkali Heath, alkali
seaheath, alkali-heath

GARRYACEAE

- Garrya buxifolia* A. Gray, boxleaf silk tassel,
dwarf silktassel, Boxleaf silktassel
Garrya congdonii Eastw., Interior silktassel,
Congdon's silk tassel, Silk Tassel,
chaparral silktassel, **L3**
Garrya elliptica Lindl., wavyleaf silktassel,
Silk Tassel Bush or Quinine Bush, coast
silk tassel, Coast silktassel
Garrya flavescens S. Watson, ashy silktassel,
ashy silk tassel
Garrya fremontii Torr., bearbrush, Fremont's
silk tassel

GENTIANACEAE

- Centaurium muehlenbergii* (Griseb.) Piper,
Muhlenberg's centaury, Monterey Centaury
Centaurium trichanthum (Griseb.) B.L. Rob., alkali
centaury
Centaurium venustum (A. Gray) B.L. Rob.,
canchalagua, Beautiful centaury, charming
centaury
Gentiana affinis Griseb. var. *ovata* A. Gray,
pleated gentian, Gentian
Swertia albicaulis (Griseb.) Kuntze, white-stem
green-gentian, Whitestem gentian
Swertia albicaulis (Griseb.) Kuntze var. *nitida*
(Benth.) Jeps., white-stem green-gentian,
Shining swertia
Zeltnera davyi (Jeps.) G. Mans., Davy's centaury

GERANIACEAE

- California macrophylla* (Hook. & Arn.) J. J.
Aldasoro, C. Navarro, P. Vargas, L. Sáez & C.
Aedo, large-leaved filaree, roundleaf stork's
bill, **G3S3.1**
Geranium bicknellii Britton, Bicknell's geranium,
Bicknell's cranesbill, **L3**
Geranium carolinianum L., Carolina geranium

GROSSULARIACEAE

- Ribes californicum* Hook. & Arn., hillside
gooseberry, California gooseberry
Ribes californicum Hook. & Arn. var.
californicum, Hillside Gooseberry, California
gooseberry
Ribes divaricatum Douglas, spreading gooseberry
Ribes malvaceum Sm., chaparral currant
Ribes malvaceum Sm. var. *malvaceum*, chaparral
currant
Ribes menziesii Pursh, canyon gooseberry,
Gooseberry
Ribes roezlii Regel, Sierra gooseberry
Ribes roezlii Regel var. *cruentum* (Greene) Rehder,
Sierra gooseberry, Spiny-fruited gooseberry
Ribes victoris Greene, Victor's gooseberry, **G3S3.3**

HIPPOCASTANACEAE

- Aesculus californica* (Spach) Nutt., California
buckeye, Shrub california buckeye, Buckeye,
California horse chestnut, horse chestnut

HYDROCHARITACEAE

- Elodea canadensis* Rich., Elodea, Waterweed,
Canadian waterweed, common water weed

- Najas flexilis* (Willd.) Rostk. & W.L.E.
Schmidt, slender water nymph, nodding
waternymph
Najas guadalupensis (Spreng.) Magnus,
guadalupe water nymph, southern
waternymph
Najas marina L., spiny naiad, marine water
nymph

HYDROPHYLLACEAE

- Emmenanthe penduliflora* Benth., whispering
bells, whisperingbells
Emmenanthe penduliflora Benth. var.
penduliflora, whispering bells,
whisperingbells
Eriodictyon californicum (Hook. & Arn.)
Torrey, Yerba Santa, California yerba
santa
Eucrypta chrysanthemifolia (Benth.) Greene
var. *chrysanthemifolia*, common eucrypta,
spotted hideseed
Hydrophyllum occidentale (S. Watson) A.
Gray, California waterleaf, western
waterleaf, **L3**
Nemophila heterophylla F.E. Fisch. & C.A.
Mey., small baby blue eyes, variable-
leaved nemophila, White nemophila,
Canyon nemophila
Nemophila menziesii Hook. & Arn., baby blue
eyes
Nemophila menziesii Hook. & Arn. var.
atomaria (F.E. Fisch. & C.A. Mey.)
Chandler, baby blue eyes
Nemophila menziesii Hook. & Arn. var.
menziesii, baby blue eyes
Nemophila parviflora Benth., smallflower
nemophila, small-flowered nemophila
Nemophila parviflora Benth. var. *parviflora*,
Woodland Nemophila, small-flowered
nemophila, smallflower nemophila
Nemophila pedunculata Benth., littlefoot
nemophila, meadow nemophila
Phacelia californica Cham., Rock phacelia,
California phacelia, Phacelia
Phacelia corymbosa Jeps., serpentine phacelia
Phacelia distans Benth., wild heliotrope,
common phacelia, distant phacelia
Phacelia divaricata (Benth.) A. Gray,
divaricate phacelia
Phacelia egena (Brand) J.T. Howell, Kaweah
River phacelia, rock phacelia

- Phacelia imbricata* Greene, imbricate phacelia
Phacelia imbricata Greene subsp. *imbricata*,
imbricate phacelia
Phacelia mutabilis Greene, changeable phacelia,
L1
Phacelia nemoralis Greene, woods phacelia, shade
phacelia
Phacelia nemoralis Greene subsp. *nemoralis*,
shade phacelia, woods phacelia
Phacelia ramosissima Lehm., branching phacelia
Phacelia ramosissima Lehm. var. *ramosissima*,
branching phacelia
Phacelia suaveolens Greene, sweet-scented
phacelia, sweetscented phacelia
Phacelia tanacetifolia Benth., Lacy Phacelia,
tansy-leafed phacelia

HYPERICACEAE

- Hypericum anagalloides* Cham. & Schltldl., tinker's
penny, Creeping St. John'swort
Hypericum concinnum Benth., goldwire, gold-wire
Hypericum formosum Kunth var. *scouleri* (Hook.)
J.M. Coult., Scouler's St. Johnswort, Scouler's
St. John's wort

IRIDACEAE

- Iris douglasiana* Herb., Douglas' iris, Douglas Iris
Iris fernaldii R.C. Foster, Fernald's iris
Iris longipetala Herb., Central Coast iris, Coast
Iris, **G3S3.2**
Iris macrosiphon Torr., long-tubed iris, bowltube
iris, Ground Iris
Sisyrinchium bellum S. Watson, blue-eyed grass,
western blue-eyed grass, Blue-Eyed-Grass
Sisyrinchium californicum (Ker Gawl.) Dryand.,
Yellow-eyed Grass, California golden-eyed
grass, golden blue-eyed grass
Sisyrinchium douglasii A. Dietr. var. *douglasii*,
Purple-eyed Grass, Douglas' blue-eyed grass

ISOETACEAE

- Isoetes howellii* Engelm., Howell's quillwort,
Quillwort
Isoetes nuttallii Engelm., Nuttall's quillwort
Isoetes orcuttii A.A. Eaton, Orcutt's quillwort,
LH?

JUGLANDACEAE

- Juglans californica* S. Watson, Southern California
walnut, Southern California black walnut,
Southern black walnut, **G3S3.2**

Juglans hindsii Jeps. ex R. E. Sm., Northern California black walnut, **G1S1.1**

JUNCACEAE

- Juncus balticus* Willd., Baltic rush, wire rush
Juncus bolanderi Engelm., Bolander's rush
Juncus bufonius L., toad rush, Common Toad Rush
Juncus covillei Piper var. *obtusatus* (Engelm.) C. L. Hitchc., Coville's rush
Juncus dubius Engelm., dubious rush, Mariposa rush
Juncus effusus L., Bog Rush, common bog rush, common rush
Juncus effusus L. var. *pacificus* Fernald & Wiegand, Bog Rush, Pacific common rush, Pacific rush, Common Rush, Pacific Bog Rush
Juncus ensifolius Wikstr., three-stamened rush, Three-stemmed rush, swordleaf rush, Sword-Leaved Rush
Juncus hemiendytus F.J. Herm., dwarf rush, Herman's dwarf rush
Juncus hemiendytus F.J. Herm. var. *hemiendytus*, dwarf rush, Vernal-Pool Rush, Herman's dwarf rush
Juncus kelloggii Engelm., Kellogg's dwarf rush
Juncus lesueurii Bol., dune rush, salt rush, **L2**
Juncus mexicanus Willd., Mexican rush
Juncus occidentalis (Coville) Wiegand, Rush, western rush, Slender juncus, **L2**
Juncus orthophyllus Coville, straight-leaved rush, straightleaf rush, **LH?**
Juncus oxymeres Engelm., pointed rush
Juncus patens E. Meyer, common rush, Spreading Rush, Rush
Juncus phaeocephalus Engelm., brownhead rush, brown-headed rush
Juncus phaeocephalus Engelm. var. *paniculatus* Engelm., Brown-headed Rush, brownhead rush, spreading brown-headed rush, Rush, **LH?**
Juncus phaeocephalus Engelm. var. *phaeocephalus*, brown-headed rush, brownhead rush, **L2**
Juncus tenuis Willd., poverty rush, Slender rush
Juncus uncialis Greene, twelfth rush, inch-high dwarf rush

Juncus xiphioides E. Meyer, irisleaf rush, iris-leaved rush

Luzula comosa E. Meyer, Wood Rush, common wood-rush, Pacific woodrush, hairy wood rush

JUNCAGINACEAE

- Lilaea scilloides* (Poir.) Hauman, flowering quillwort, awl-leaf lilaea
Triglochin maritima L., Arrowgrass, seaside arrowgrass, seaside arrow-grass, **L3**

LAMIACEAE

- Agastache urticifolia* (Benth.) Kuntze, nettle-leaf giant hyssop, Horse-mint, horsemint giant hyssop
Lepechinia calycina (Benth.) Epling, White Pitcher Sage, Woodbalm, pitcher sage, woodbalm, pitcher sage
Mentha arvensis L., Field mint, wild mint, Marsh Mint, American Wild Mint
Monardella candicans Benth., Sierra monardella, **G3S3.3**
Monardella douglasii Benth., Douglas' monardella
Monardella douglasii Benth. subsp. *douglasii*, Douglas' monardella
Monardella sheltonii Torr., Coyote mint, Shelton's coyote mint, Shelton's monardella, **L3**
Monardella villosa Benth., coyote mint
Monardella villosa Benth. subsp. *globosa* (Jeps.) Jokerst, robust monardella, robust coyote mint, **G5T2S2.2**
Monardella villosa Benth. subsp. *villosa*, coyote mint
Monardella viridis Jeps., green monardella
Monardella viridis Jeps. subsp. *viridis*, green monardella, **G3T3S3.3**
Pogogyne douglasii Benth., Douglas' pogogyne, Douglas' mesamint
Pogogyne douglasii Benth. subsp. *parviflora* (Benth.) J.T. Howell, Douglas' mesamint, Douglas' pogogyne
Pogogyne serpylloides (Torr.) A. Gray, thyme-leaf mesa mint, thymeleaf mesamint
Prunella vulgaris L., common selfheal, Selfheal, self-heal
Prunella vulgaris L. var. *lanceolata* (Barton) Fernald, Mountain Selfheal, Selfheal, lance-leaf self-heal
Salvia columbariae Benth., chia, chia sage
Salvia somomensis Greene, Sonoma sage, creeping sage

Salvia spathacea Greene, hummingbird sage
Satureja douglasii (Benth.) Briq., yerba buena
Scutellaria antirrhinoides Benth., nose
 skullcap, snapdragon skullcap
Scutellaria californica A. Gray, California
 skullcap
Scutellaria siphocampyloides Vatke, curve-
 flowered skullcap, Skullcap, grayleaf
 skullcap, Gray-leaved Skullcap
Scutellaria tuberosa Benth., common skullcap,
 skullcap, Scullcap, Danny's skullcap,
 Dannie's Scullcap
Stachys ajugoides Benth., bugle hedgenettle,
 Ajuga hedge nettle, Hedge Nettle
Stachys ajugoides Benth. var. *rigida* (Benth.)
 Jeps. & Hoover, rigid hedge-nettle, Hedge
 Nettle, Rigid Hedge Nettle
Stachys albens A. Gray, White Hedge-nettle,
 cobwebby hedge-nettle, whitestem
 hedgenettle
Stachys bullata Benth., California hedgenettle,
 wood-mint, California Hedge Nettle,
 southern hedge-nettle
Stachys stricta E. Greene, Sonoma hedge-
 nettle, Sonoma hedgenettle
Trichostema lanceolatum Benth., vinegarweed
Trichostema laxum A. Gray, turpentine weed
Trichostema oblongum Benth., oblong
 bluecurls, Mountain Bluecurls
Trichostema ruygtii H. Lewis, Napa Blucurls,
G3S3

LAURACEAE

Umbellularia californica (Hook. & Arn.)
 Nutt., California laurel, bay tree, Oregon
 Myrtle, California bay, California laurel

LILIACEAE

Allium amplexans Torrey, narrow-leaved
 onion, narrowleaf onion
Allium bolanderi S. Watson var. *bolanderi*,
 Bolander's onion
Allium cratericola Eastw., Cascade onion
Allium falcifolium Hook. & Arn., scytheleaf
 onion, sickle-leaf onion
Allium fimbriatum S. Watson, fringed onion,
 Wild Onion
Allium fimbriatum S. Watson var. *fimbriatum*,
 fringed onion

Allium fimbriatum S. Watson var. *purdyi* (Eastw.)
 D. McNeal, Purdy's onion, **G4G5T3S3.3?**
Allium lacunosum S. Watson var. *lacunosum*,,
 Pitted onion, **L3**
Allium serra McNeal & Ownbey, jeweled onion
Allium unifolium Kellogg, one, leaf onion, oneleaf
 onion
Brodiaea appendiculata Hoover, Hoover's
 brodiaea, appendage brodiaea
Brodiaea californica Lindl., California brodiaea
Brodiaea californica Lindl. var. *leptandra*
 (Greene) Hoover, narrow-anthered California
 brodiaea, Sonoma brodiaea, California
 brodiaea, **G4?T2T3S2S3.2**
Brodiaea coronaria (Salisb.) Engler, early harvest
 brodiaea, Harvest brodiaea, crown brodiaea
Brodiaea elegans Hoover,, Harvest brodiaea
Brodiaea elegans Hoover subsp. *elegans*, harvest
 brodiaea
Brodiaea terrestris Kellogg, dwarf brodiaea
Brodiaea terrestris Kellogg subsp. *terrestris*, dwarf
 brodiaea
Calochortus albus (Benth.) Douglas ex A.W.
 Wood, White Globe Lily, white globelily,
 white fairy lantern
Calochortus amabilis Purdy, Golden globelily,
 golden fairy lantern, short lily
Calochortus luteus Lindl., yellow mariposa lily,
 yellow mariposa
Calochortus pulchellus (Benth.) A.W. Wood, Mt.
 Diablo fairy-lantern, Mount Diablo globelily,
G2S2.1
Calochortus splendens Benth., splendid mariposa
 lily, splendid mariposa
Calochortus superbus J.T. Howell, yellow
 mariposa
Calochortus tolmiei Hook. & Arn., Tolmie's star-
 tulip, Pussy-ears, White pussy ears, Tolmie
 star-tulip, Hairy Star Tulip
Calochortus uniflorus Hook. & Arn., large-
 flowered star-tulip
Calochortus venustus Benth., Butterfly Mariposa
 Lily, butterfly mariposa, butterfly mariposa
 lily, **L1**
Calochortus vestae Purdy, coast range mariposa,
 coast range mariposa lily, Yellow mariposa
Camassia quamash (Pursh) Greene, common
 camas, Camas
Camassia quamash (Pursh) Greene subsp.
quamash, camas, Star camas, Common Camas

- Chlorogalum pomeridianum* (DC.) Kunth,
Soap plant, soaproot, wavyleaf soap plant,
Amole
- Chlorogalum pomeridianum* (DC.) Kunth var.
pomeridianum, Soap Plant, wavyleaf soap
plant, common soaproot
- Dichelostemma capitatum* (Benth.) A.W.
Wood, blue dicks, bluedicks, Blue Dicks
or Wild Hyacinth
- Dichelostemma congestum* (Sm.) Kunth,
ookow, Fork-Toothed Ookow
- Dichelostemma multiflorum* (Benth.) A.
Heller, wild hyacinth, Manyflower
brodiaea, roundtooth snakelily, Many-
flowered brodiaea
- Dichelostemma volubile* (Kellogg) A. Heller,
twining snakelily, twining brodiaea
- Disporum hookeri* (Torr.) Britt., Hooker's fairy
bell, Fairy Bells, drops of gold
- Disporum smithii* (Hook.) Piper, large-
flowered fairy bell, Fairy Lantern, Coast
fairy bells, largeflower fairybells
- Erythronium californicum* Purdy, California
fawnlily, California fawn lily
- Erythronium helenae* Appleg., St. Helena fawn
lily, Pacific fawnlily, **G3S3.2**
- Fritillaria affinis* (Schultes) Sealy, Mission
Bells, checker lily
- Fritillaria affinis* (Schultes) Sealy var. *affinis*,
checker lily
- Fritillaria biflora* Lindl., chocolate lily
- Fritillaria pluriflora* Benth., adobe-lily, adobe
lily, **G2S2.2**
- Fritillaria purdyi* Eastw., Purdy's fritillary,
G3S3.2
- Fritillaria recurva* Benth., scarlet fritillary
- Lilium pardalinum* Kellogg subsp. *pardalinum*,
leopard lily
- Lilium rubescens* S. Watson, redwood lily,
Chaparral lily, **G3S3.2**
- Muilla maritima* (Torr.) S. Watson, sea muilla,
common muilla
- Odontostomum hartwegii* Torr.,
Odontostomum, Hartweg's
odontostomum, Hartweg's doll's-lily
- Scoliopus bigelovii* Torr., California fetid
adderstongue, Fetid Adder's Toungue,
slink-pod
- Smilacina racemosa* (L.) Link, large false-
solomon's-seal, Western Solomon's Seal,
Racemose False Solomon's-seal, Fat
Solomon, Branched solomon's seal, Western
False Solomon's-Seal
- Smilacina stellata* (L.) Desf., False solomon seal,
little false-solomon's-seal, Nuttall's Solomon's
Seal, Slim Solomon, Panicked False
Solomon's-seal, Star-Flowered False-
Solomon's-Seal
- Smilax californica* (A. DC.) A. Gray, California
greenbriar, California greenbrier, Greenbriar,
Greenbrier
- Trillium albidum* Freeman, giant white wakerobin
- Trillium chloropetalum* (Torr.) T.J. Howell, giant
wakerobin, Common trillium, Trillium
- Trillium ovatum* Pursh, Western trillium, Wake-
robin, Pacific trillium, western wakerobin
- Triteleia hyacinthina* (Lindl.) Greene, white
brodiaea, Wild Hyacinth
- Triteleia ixioides* (S. Watson) Greene, Golden
brodiaea, prettyface, pretty face, **LH?**
- Triteleia ixioides* (S. Watson) Greene subsp.
scabra (Greene) L. Lenz, foothill triteleia,
prettyface
- Triteleia laxa* Benth., Ithuriel's spear
- Triteleia lugens* Greene, dark-mouthed triteleia,
Coast Range triplet-lily, Coast Range triteleia,
G3S3.3
- Triteleia peduncularis* Lindl., long-rayed brodiaea,
long-ray brodiaea, Marsh Tritileia
- Xerophyllum tenax* (Pursh) Nutt., beargrass,
common beargrass
- Zigadenus fremontii* (Torr.) S. Watson, chaparral
zygadene, Death camas, Starlily, Fremont's
deathcamas, Fremont's Star Lily, Star Lily,
Zygadene, Fremont's death-camas
- Zigadenus micranthus* Eastw., smallflower
deathcamas, small-flowered death-camas
- Zigadenus micranthus* Eastw. var. *fontanus*
(Eastw.) McNeal, fountain death-camas,
smallflower deathcamas, **G4T3S3.2**
- Zigadenus micranthus* Eastw. var. *micranthus*,
smallflower deathcamas, little-flowered death-
camas
- Zigadenus paniculatus* (Nutt.) S. Watson, panicked
death-camas, Sandcorn, foothill deathcamas,
Deathcamas, Sand corn, **LH?**
- Zigadenus venenosus* S. Watson var. *venenosus*,
death camas, meadow deathcamas

LIMNANTHACEAE

Limnanthes alba Benth., white meadowfoam

- Limnanthes alba* Benth. subsp. *alba*, white meadowfoam, typical white meadowfoam
Limnanthes douglasii R. Br., Common meadowfoam, Douglas' meadowfoam, Common Meadow-foam
Limnanthes douglasii R. Br. subsp. *douglasii*, Douglas' meadowfoam, snow-white Douglas' meadowfoam
Limnanthes douglasii R. Br. subsp. *nivea* (C. Mason) C. Mason, Douglas' meadowfoam
Limnanthes douglasii R. Br. subsp. *rosea* (Benth.) C. Mason, Douglas' meadowfoam, rosy Douglas' meadowfoam
Limnanthes floccosa Howell subsp. *floccosa*, woolly meadowfoam, **G4T4S3.2**
Limnanthes vinculans Ornd., Sebastopol meadowfoam, **G2S2.1**

LINACEAE

- Hesperolinon bicarpellatum* (H. Sharsm.) H. Sharsm., twocarpel dwarf-flax, two-carpellate western flax, **G2S2.2**
Hesperolinon breweri (A. Gray) Small, Brewer's western flax, Brewer's dwarf-flax, **G2S2.2**
Hesperolinon californicum (Benth.) Small, California dwarf-flax, California western flax
Hesperolinon clevelandii (Greene) Small, Allen Springs dwarf-flax, Allen Springs western flax
Hesperolinon disjunctum H. Sharsm., coast range western flax, Coast Range dwarf-flax
Hesperolinon drymarioides (Curran) Small, drymaria-like western flax, drymary dwarf-flax, **G1S1.2**
Hesperolinon micranthum (A. Gray) Small, Small-flowered Dwarf Flax, smallflower dwarf-flax, Threadstem flax, Common dwarf flax, small-flower western flax
Hesperolinon sharsmithiae O'Donnell, Helen Sharesmith Flax
Hesperolinon serpentinum N. McCarten, Napa dwarf-flax, Napa western flax, **G2S2.1**
Hesperolinon spergulinum (A. Gray) Small, slender western flax, slender dwarf-flax

LOASACEAE

- Mentzelia dispersa* S. Watson, Nada stickleaf, scattered blazing star, bushy blazingstar
Mentzelia laevicaulis (Hook.) Torr. & A. Gray, Blazing Star, smoothstem blazingstar, smooth-stem blazing star, Giant Blazingstar
Mentzelia micrantha (Hook. & Arn.) Torr. & A. Gray, San Luis blazingstar, chaparral blazing star, San Luis Stick Leaf, small-flowered stickleaf

LYTHRACEAE

- Ammannia robusta* Heer & Regel, Grand ammannia, Grand redstem
Lythrum californicum Torr. & A. Gray, common loosestrife, California loosestrife

MALVACEAE

- Malacothamnus helleri* (Eastw.) Kearney, Heller's bush mallow, **G3QS3.3**
Malvella leprosa (Ortega) Krapov., alkali mallow
Sidalcea calycosa M.E. Jones, Pt. Reyes Sidalcea, checker mallow, annual checkerbloom
Sidalcea diploscypha (Torr. & A. Gray) Benth., fringed checkerbloom, Fringed sidalcea, fringed checker mallow
Sidalcea hartwegii Benth., Hartweg's checkerbloom, Hartweg sidalcea, valley checkerbloom
Sidalcea hickmanii Greene subsp. *viridis* C.L. Hitchc., Marin checkerbloom, **G3T2S2.2?**
Sidalcea hirsuta A. Gray, hairy checkerbloom
Sidalcea malviflora (DC.) Benth., Checker bloom, checker mallow, Wild Hollyhock, dwarf checkerbloom
Sidalcea malviflora (DC.) Benth. subsp. *asprella* (Greene) C.L. Hitchc., dwarf checkerbloom, harsh checker mallow, Harsh Checker-Mallow
Sidalcea malviflora (DC.) Benth. subsp. *laciniata* C.L. Hitchc., dwarf checkerbloom, laciniata checker mallow
Sidalcea malviflora (DC.) Benth. subsp. *malviflora*, checker mallow, dwarf checkerbloom
Sidalcea oregana (Torr. & A. Gray) A. Gray, Oregon checker mallow, Oregon checkerbloom
Sidalcea oregana (Torr. & A. Gray) A. Gray subsp. *hydrophila* (A. Heller) C.L. Hitchc., Oregon checkerbloom, marsh checkerbloom, **G5T2?S2?**

MYRSINACEAE

- Anagallis minima* (L.) E. H. L. Krause,
chaffweed, false pimpernel
Glaux maritima L., sea milk-wort, sea
milkwort

OLEACEAE

- Forestiera pubescens* Nutt., desert olive,
stretchberry, **L2**
Fraxinus dipetala Hook. & Arn., California
ash, Foothill Ash, Flowering ash, two-
petaled ash
Fraxinus latifolia Benth., Oregon ash

ONAGRACEAE

- Camissonia contorta* (Douglas) P.H. Raven,
contorted sun-cup, plains evening-
primrose
Camissonia graciliflora (Hook. & Arn.) P. H.
Raven, hill sun-cup, hillsuncup
Camissonia hirtella (Greene) P.H. Raven,
hairy sun-cups, Santa Cruz Island suncup
Camissonia intermedia P.H. Raven,
intermediate suncup, intermediate sun-
cups
Camissonia luciae P.H. Raven, Santa Lucia
sun-cup, Santa Lucia suncup, **LH?**
Camissonia ovata (Torr. & A. Gray) P.H.
Raven, Sun Cup, sun-cup
Camissonia strigulosa (F.E. Fisch. & C.A.
Mey.) P.H. Raven, strigose sun-cup,
Contorted Primrose, sandysoil suncup
Clarkia affinis H.F. & M.E. Lewis, chaparral
clarkia, chaparral fairyfan
Clarkia amoena (Lehm.) A. Nelson & J.F.
Macbr., farewell to spring, farewell-to-
spring
Clarkia amoena (Lehm.) A. Nelson & J.F.
Macbr. subsp. *huntiana* (Jeps.) F.H. Lewis
& M.R. Lewis, farewell to spring,
farewell-to-spring
Clarkia bottae (Spach) F.H. Lewis & M.R.
Lewis, punch-bowl godetia, farwell-to-
spring, **LH?**
Clarkia concinna (F.E. Fisch. & C.A. Mey.)
Greene, red ribbons
Clarkia concinna (F.E. Fisch. & C.A. Mey.)
Greene subsp. *automixa* R.N. Bowman,
Santa Clara red ribbons, red ribbons,
G5?T3S3.3

- Clarkia concinna* (F.E. Fisch. & C.A. Mey.)
Greene subsp. *concinna*, red ribbons
Clarkia gracilis (Piper) A. Nelson & J.F. Macbr.,
Farewelltospring, Clarkia, graceful clarkia,
slender clarkia
Clarkia gracilis (Piper) A. Nelson & J.F. Macbr.
subsp. *gracilis*, slender clarkia, graceful
clarkia
Clarkia gracilis (Piper) A. Nelson & J.F. Macbr.
subsp. *sonomensis* (C.L. Hitchc.) F.H. Lewis
& M.R. Lewis, Sonoma clarkia
Clarkia gracilis (Piper) A. Nelson & J.F. Macbr.
subsp. *tracyi* (Jeps.) Abdel-Hamee & R. Snow,
Tracy's clarkia, **G5T3S3.2**
Clarkia purpurea (Curtis) A. Nelson & J.F.
Macbr., purple clarkia, winecup clarkia
Clarkia purpurea (Curtis) A. Nelson & J.F. Macbr.
subsp. *quadrivulnera* (Douglas) F.H. Lewis &
M.R. Lewis, Clarkia, purple godetia, winecup
clarkia, purple clarkia
Clarkia purpurea (Curtis) A. Nelson & J.F. Macbr.
subsp. *viminea* (Douglas) F.H. Lewis & M.R.
Lewis, purple clarkia, Large Godetia, winecup
clarkia
Clarkia rhomboidea Douglas, Rhomboid Farewell
to Spring, diamond clarkia, diamond-petaled
clarkia, Clarkia, Tongue clarkia, Forest clarkia
Clarkia unguiculata Lindl., elegant clarkia,
woodland clarkia
Epilobium brachycarpum C. Presl, Panicked
Willow-herb, autumn willowweed, Annual
fireweed, tall annual willowherb, Willow herb
Epilobium canum (Greene) P.H. Raven, California
fuchsia, zauschneria, California fuchsia,
hummingbird trumpet
Epilobium canum (Greene) P.H. Raven subsp.
canum, California fuchsia, zauschneria,
hummingbird trumpet, California-fuchsia
Epilobium ciliatum Raf., Northern Willow-herb,
willowherb, Slender Willow-herb, fringed
willowherb
Epilobium ciliatum Raf. subsp. *ciliatum*, fringed
willowherb, Northern Willow-herb,
willowherb, willow-herb
Epilobium densiflorum (Lindl.) P. Hoch & P.H.
Raven, Dense-flowered Boisduvalia, dense
boisduvalia, Dense-Flowered Spike-Primrose,
denseflower willowherb, Willow herb
Epilobium foliosum (Torr. & A. Gray) Suksd.,
California willowherb

Epilobium halleianum Hausskn., Hall's Willow-herb, Hall's willowherb, Pringle's Willow-herb, glandular willowherb, Slender Willowherb, hairy willowherb,

L3

Epilobium minutum Lehm., chaparral willowherb, little willowherb, Willow-herb, Slender annual fireweed, Desert willow herb, Minute Willowherb

Epilobium pygmaeum (Speg.) P. Hoch & P.H. Raven, smooth spike-primrose, smooth boisduvalia

Epilobium torreyi (S. Watson) P. Hoch & P.H. Raven, Narrow-Leaved Boisduvalia, narrow boisduvalia, Boisduvalia, Torrey's willowherb

Gaura coccinea Pursh, scarlet gaura, scarlet beeblossom, **LH?**

Oenothera elata Kunth, Hooker's Evening Primrose, evening-primrose, Hooker's evening-primrose

Oenothera elata Kunth subsp. *hirsutissima* (S. Watson) W. Dietr., hairy evening-primrose, Hooker's evening primrose, Evening Primrose, Hooker's evening-primrose

Oenothera elata Kunth subsp. *hookeri* (Torr. & A. Gray) W. Dietr. & W.L. Wagner, Hooker's evening-primrose, Common evening primrose, Evening Primrose

ORCHIDACEAE

Corallorrhiza maculata, Spotted coralroot, summer coralroot, summer coral root

Corallorrhiza striata, striped coral root, hooded coralroot

Epipactis gigantea Hook., stream orchid, giant helleborine, Stream orchis

Goodyera oblongifolia Raf., Rattlesnake-Plantain, rattlesnake plantain, western rattlesnake plantain

Piperia elegans (Lindl.) Rydb., elegant rein orchid, Coast Piperia, hillside piperia, elegant piperia, Rein Orchis, Rein Orchid

Piperia transversa Suksd., royal rein orchid, mountain piperia

Piperia unalascensis (Spreng.) Rydb., Rein orchid, Alaska rein orchid, Alaska piperia, slender-spire orchid

Platanthera leucostachys Lindl., white bog orchid, White Rein Orchid, Sierra bog orchid, White flowered bog orchid

Spiranthes porrifolia Lindl., Western ladies' tresses, creamy ladies-tresses, creamy ladies'-tresses, Western Ladies-Tresses

OROBANCHACEAE

Boschniakia strobilacea A. Gray, California groundcone, Ground cone

Orobanche bulbosa G. Beck, chaparral broomrape

Orobanche fasciculata Nutt., Fascicled Broomrape, clustered broomrape, clustered broomrape, Pinyon Broomrape

Orobanche uniflora L., naked broom-rape, Broomrape, oneflowered broomrape

Orobanche valida Jeps., Rock Creek broomrape, Rock Creek broom-rape

Orobanche valida Jeps. subsp. *howellii* Heckard & L.T. Collins, Howell's broomrape, **G3T3S3.3**

OXALIDACEAE

Oxalis albicans Kunth, white oxalis, Hairywood Sorrell, radishroot woodsorrel

Oxalis albicans Kunth subsp. *pilosa* (Nutt.) Eiten, radish-root woodsorrel, hairy wood-sorrel, radishroot woodsorrel

PAPAVERACEAE

Dendromecon rigida Benth., bush poppy, tree poppy

Eschscholzia caespitosa Benth., Tufted PFoppy, Foothill poppy, tufted eschscholzia

Eschscholzia californica Cham., California poppy

Eschscholzia lobbii Greene, fryingpans, frying

pans

Platystemon californicus Benth., creamcups, cream

cups

Stylomecon heterophylla (Benth.) G.C. Taylor,

windpoppy, wind-poppy, wind poppy

PHILADELPHACEAE

Whipplea modesta Torr., Whipplea, yerba de selva, common whipplea, Modesty

PHRYMACEAE

Mimulus alsinoides Benth., wingstem monkeyflower, chickweed monkeyflower, **LH?**

- Mimulus angustatus* (A. Gray) A. Gray, narrow-leaved pansy monkeyflower, purplelip pansy monkeyflower
- Mimulus aurantiacus* Curtis, island monkeyflower, Bush Monkey Flower, sticky monkeyflower
- Mimulus bolanderi* A. Gray, Bolander's monkeyflower
- Mimulus cardinalis* Benth., scarlet monkeyflower, Cardinal monkey flower
- Mimulus congdonii* B.L. Rob., Congdon's monkeyflower
- Mimulus douglasii* (Benth.) A. Gray, brownies, purple mouse-ears
- Mimulus floribundus* Lindl., floriferous monkeyflower, manyflowered monkeyflower, Many-flowered monkey flower
- Mimulus guttatus* DC., Seep Monkey-Flower, common yellow monkeyflower, seep monkeyflower, common monkeyflower, Common Large Monkeyflower, Yellow Monkey Flower
- Mimulus kelloggii* (Greene) A. Gray, Kellogg's monkeyflower
- Mimulus latidens* (A. Gray) Greene, broad-toothed monkeyflower, broadtooth monkeyflower
- Mimulus layneae* (Greene) Jeps., Layne's monkeyflower
- Mimulus moschatus* Lindl., Musk Flower, muskflower, musk monkeyflower
- Mimulus nudatus* Greene, bare monkeyflower, **G3S3.3**
- Mimulus pilosus* (Benth.) S. Watson, false monkeyflower, Downy Monkey-flower, Downy Mimetanthe, Snouted monkey flower
- Mimulus pulsiferae* A. Gray, Pulsifer's monkeyflower, Candelabrum Monkey-Flower, candelabrum monkeyflower
- Mimulus rattanii* A. Gray, Rattan's monkeyflower
- Mimulus tricolor* Lindl., tricolor monkeyflower

PLANTAGINACEAE

- Plantago elongata* Pursh, long-leaf plantain, Annual Coast Plantago, coastal plantain, prairie plantain

- Plantago erecta* E. Morris, dotseed plantain, English plantain, Foothill plantain, California plantain
- Plantago maritima* L., alkali plantain, Pacific Seaside Plantain, goose tongue, maritime plantain

PLUMBAGINACEAE

- Limonium californicum* (Boiss.) A. Heller, western marsh-rosemary, Sea Lavender, Marsh Rosemary, California sealavender, **L2**

POACEAE

- Achnatherum coronatum* (Thurb.) Barkworth, Giant stipa, giant ricegrass, giant needlegrass, **LH?**
- Achnatherum lemmonii* (Vasey) Barkworth, Lemmon's needlegrass, Lemmon's stipa
- Agrostis elliotiana* Schultes, Elliott's bentgrass
- Agrostis exarata* Trin., spike bentgrass, Spiked Bentgrass, Spike redtop, Spike Bent Grass, bentgrass
- Agrostis hallii* Vasey, Hall's bentgrass, Hall's Bent Grass, Hall redtop
- Agrostis microphylla* Steud., Small-leaved Bentgrass, little-leaf bentgrass, small-leaf bentgrass
- Agrostis pallens* Trin., thingrass, seashore bentgrass, Bent grass, Leafy Bent Grass
- Alopecurus geniculatus* L., Marsh Foxtail, Water foxtail
- Alopecurus saccatus* Vasey, foxtail, Pacific foxtail
- Andropogon glomeratus* (Walt.) Britton, Sterns & Pogg. var. *scabriglumis* C.S. Campb., southwestern bushy bluestem, beardgrass, Bushy beardgrass
- Beckmannia syzigachne* (Steud.) Fernald, sloughgrass, Slough grass, American sloughgrass
- Bromus carinatus* Hook. & Arn., California brome grass, California Bromegrass, California brome
- Bromus carinatus* Hook. & Arn. var. *carinatus*, Mountain Brome, California brome
- Bromus grandis* (Shear) Hitchc., tall brome, **L1**
- Bromus laevipes* Shear, woodland brome, Chinook brome, Narrow-flowered brome
- Bromus vulgaris* (Hook.) Shear, common brome, Columbia brome
- Calamagrostis koelerioides* Vasey, fire reedgrass

- Calamagrostis ophitidis* (J.T. Howell) Nygren, serpentine reed grass, serpentine reedgrass, **G3S3.3**
- Calamagrostis rubescens* Buckley, pine grass, pinegrass
- Danthonia californica* Bol., California oatgrass
- Danthonia californica* Bol. var. *californica*, California oatgrass
- Deschampsia cespitosa* (L.) P. Beauv., Tufted Hairgrass, California Hairgrass, tufted hair-grass
- Deschampsia danthonioides* (Trin.) Munro, annual hairgrass
- Deschampsia elongata* (Hook.) Munro, Hairgrass, slender hairgrass
- Distichlis spicata* (L.) Greene, Saltgrass, inland saltgrass, salt grass
- Elymus* × *hanseni*, Squirreltail
- Elymus elymoides* (Raf.) Swezey, Bottlebrush Squirreltail, Bottlebrush, squirreltail, Squirrel-tail grass, **L3**
- Elymus glaucus* Buckley, blue wildrye
- Elymus glaucus* Buckley subsp. *glaucus*, Western rye grass, blue wildrye, western rye, Blue Wild-Rye
- Elymus glaucus* Buckley subsp. *jepsonii* (Burt Davy) Gould, Jepson's blue wildrye, Western rye grass, **L1**
- Elymus multisetus* (J.G. Sm.) Burt Davy, big squirreltail, Big Squirreltail Grass
- Elymus trachycaulus* (Link) Shinn., slender wheatgrass
- Eragrostis hypnoides* (Lam.) Britton, Sterns & Pogg., teal lovegrass
- Eragrostis mexicana* (Hornem.) Link subsp. *virescens* (J. Presl) S. D. Koch & Sánchez Vega, Mexican lovegrass, Orcutt's eragrostis
- Eragrostis pectinacea* (Michx.) Nees, tufted lovegrass
- Eragrostis pectinacea* (Michx.) Nees var. *pectinacea*, tufted lovegrass
- Festuca californica* Vasey, California fescue
- Festuca elmeri* Scribn. & Merr., Elmer fescue, coast fescue
- Festuca idahoensis* Elmer, Idaho fescue, Blue bunchgrass, Blue Fescue
- Festuca occidentalis* Hook., western fescue
- Festuca rubra* L., red fescue
- Glyceria occidentalis* (Piper) J.C. Nelson, northwestern mannagrass, western mannagrass, waxy mannagrass
- Hordeum brachyantherum* Nevski, meadow barley
- Hordeum brachyantherum* Nevski subsp. *brachyantherum*, meadow barley
- Hordeum brachyantherum* Nevski subsp. *californicum* (Covas & Stebb.) V. Bothmer, et al., California meadow barley, California barley, meadow barley
- Hordeum depressum* (Scribn. & J.G. Sm.) Rydb., low barley, dwarf barley, alkali barley
- Hordeum jubatum* L., Foxtail Barley, squirreltail barley, Fox-Tail Barley
- Koeleria macrantha* (Ledeb.) J.A. Schultes, junegrass, Prairie junegrass, June Grass
- Leersia oryzoides* (L.) Sw., rice cutgrass
- Leptochloa fascicularis* (Lam.) A. Gray, sprangletop, **L3**
- Leymus triticoides* (Buckley) Pilger, creeping wildrye, Valley Wild-rye, alkali rye, beardless wildrye
- Melica californica* Scribn., California melicgrass, California melic
- Melica geeyeri* Bol., Geyer's onion-grass, Geyer's oniongrass
- Melica harfordii* Bol., Harford's melica, Harford melic, Harford's oniongrass, Harford's Melic
- Melica imperfecta* Trin., small-flowered melica, smallflower melicgrass, California Melic, coast range melic
- Melica torreyana* Scribn., Torrey's melicgrass, Torrey's melica, Torrey melic
- Muhlenbergia andina* (Nutt.) Hitchc., foxtail muhly
- Nassella cernua* (Stebb. & Love) Barkworth, Needle Grass, Nodding stipa, nodding needlegrass, nodding tussockgrass
- Nassella lepida* (Hitchc.) Barkworth, small-flowered needlegrass, Small-flowered Stipa, smallflower tussockgrass, Foothill stipa
- Nassella pulchra* (Hitchc.) Barkworth, Purple stipa, purple needlegrass, purple tussockgrass
- Panicum acuminatum* Sw., Western Panicgrass, western panicum, Western witch grass
- Panicum acuminatum* Sw. var. *acuminatum*, Pacific panic grass, western panicum, Panic Grass
- Panicum capillare* L., witchgrass, Old witch grass
- Paspalum distichum* L., knotgrass, knot grass
- Phalaris angusta* Nees, timothy canarygrass

Phalaris californica Hook. & Arn., California canarygrass, Canarygrass
Phalaris lemmonii Vasey, Lemmon's canarygrass
Phragmites australis (Cav.) Steud., common reed
Pleuropogon californicus (Nees) Vasey, annual semaphoregrass, semaphore grass
Poa howellii Vasey & Scribn., Howell's blue grass, Howell's bluegrass
Poa napensis Beetle, Napa blue grass, Napa bluegrass, **G1S1.1**
Poa secunda J. Presl, one-sided blue grass, Sandberg bluegrass, Pine Bluegrass
Poa secunda J. Presl subsp. *secunda*, Pine Bluegrass, one-sided blue grass, Sandberg's Bluegrass
Puccinellia simplex Scribn., California alkaligrass
Scribneria bolanderi (Thurb.) Hackel, Scribner's grass, Scribneria
Setaria parviflora (Poir.) Kerguelen, Bristly foxtail, Knotroot bristlegrass, perennial foxtail
Spartina foliosa Trin., Cordgrass, California cordgrass, California cord grass, Pacific Cordgrass, **L3**
Torreyochloa pallida (J. Presl) G.L. Church var. *pauciflora* (J. Presl) J.I. Davis, pale false mannagrass, weak mannagrass, Mannagrass
Trisetum canescens Buckley, tall trisetum, nodding oatgrass, Nodding trisetum
Vulpia microstachys (Nutt.) Benth., small fescue, Fescue
Vulpia microstachys (Nutt.) Benth. var. *ciliata* (Beal) Lonard & Gould, Eastwood fescue
Vulpia microstachys (Nutt.) Benth. var. *confusa* (Piper) Lonard & Gould, confusing fescue, Tracy's fescue
Vulpia microstachys (Nutt.) Benth. var. *microstachys*, desert fescue, small fescue
Vulpia microstachys (Nutt.) Benth. var. *pauciflora* (Beal) Lonard & Gould, Pacific fescue, Fescue, Few-flowered Fescue
Vulpia octoflora (Walter) Rydb., six-weeks fescue, sixweeks fescue, Slender Fescue

POLEMONIACEAE

Allophyllum divaricatum (Nutt.) A.D. Grant & V.E. Grant, Straggling gilia, purple false gilyflower, purple false-gilia
Allophyllum gilioides (Benth.) A.D. Grant & V.E. Grant, dense false-gilia, dense false gilyflower, **LH?**
Allophyllum gilioides (Benth.) A.D. Grant & V.E. Grant subsp. *violaceum* (A. Heller) A.G. Day, dense false gilyflower, dense false-gilia
Collomia diversifolia Greene, serpentine collomia, **G3S3.3**
Collomia grandiflora Lindl., large-flowered collomia, grand collomia, Mountain collomia, **L3**
Collomia heterophylla Hook., varied-leaved collomia, Variableleaf collomia
Gilia achilleifolia Benth., California gilia
Gilia achilleifolia Benth. subsp. *multicaulis* (Benth.) A.D. Grant & V.E. Grant, many-stemmed California gilia, California gilia, Many-stemmed Gilia
Gilia capitata Sims, Blue Field Gilia, blue field-gilia, bluehead gilia
Gilia capitata Sims subsp. *capitata*, blue field-gilia, bluehead gilia
Gilia clivorum (Jeps.) V.E. Grant, many-stemmed gilia, purplespot gilia, purple-spot gilia
Gilia sinistra M.E. Jones, Alva Day's gilia, clockwise gilia
Gilia sinistra M.E. Jones subsp. *pinnatisecta* (H. Mason & A.D. Grant) A.G. Day, cut-leaf clockwise gilia, Alva Day's gilia, **G4G5T3S3.3**
Gilia tricolor Benth., Tricolor gilia, bird's eyes, bird's-eye gilia
Gilia tricolor Benth. subsp. *tricolor*, bird's eyes, bird's-eye gilia
Leptosiphon acicularis (Green) Jeps., bristly linanthus, **G3S3.2**
Leptosiphon jepsonii (Schemske & Goodwillie) J. M. Porter & L. A. Johnson, Jepson's linanthus, **G2S2.2**
Leptosiphon latisectus (E. G. Buxton) J. M. Porter & L. A. Johnson, broad-lobed linanthus, **G3S3.3**
Linanthus androsaceus (Benth.) Greene, False baby stars, false babystars, showy linanthus, common linanthus

Linanthus bicolor (Nutt.) Greene, bicolor linanthus, two-color linanthus, Linanthus, true babystars, True baby stars
Linanthus bolanderi (A. Gray) Greene, Bolander's linanthus
Linanthus ciliatus (Benth.) Greene, whisker-brush, Whisker brush linanthus, Whisker linanthus, whiskerbrush
Linanthus dichotomus Benth., eveningsnow, evening-snow
Linanthus parviflorus (Benth.) Greene, common linanthus, variable linanthus
Linanthus pygmaeus (Brand) J.T. Howell, pygmy linanthus
Linanthus pygmaeus (Brand) J.T. Howell subsp. *continentalis* P.H. Raven., pygmy linanthus
Navarretia atractyloides (Benth.) Hook. & Arn., holly-leaf navarretia, hollyleaf pincushionplant
Navarretia cotulifolia (Benth.) Hook. & Arn., cotula navarretia, broad-leaved navarretia, cotulaleaf pincushionplant., **G3S3.2**
Navarretia divaricata (A. Gray) Greene, Mountain Navarretia, divaricate navarretia, **L3**
Navarretia divaricata (A. Gray) Greene subsp. *vividior* (Jeps. & V.L. Bailey) H. Mason, divaricate navarretia, mountain navarretia
Navarretia heterandra H. Mason, Tehama pincushionplant, Tehama navarretia, **G3S3.3**
Navarretia heterodoxa (Greene) Greene, Calistoga pincushionplant, Calistoga navarretia
Navarretia intertexta (Benth.) Hook., needleleaf navarretia, Needle-Leaved Navarretia, interwoven navarretia
Navarretia intertexta (Benth.) Hook. subsp. *intertexta*, interwoven navarretia, needleleaf navarretia
Navarretia jepsonii V.L. Bailey, Jepson's navarretia, Jepson's pincushionplant, **G3S3.3**
Navarretia leucocephala Benth., white-headed navarretia, whitehead navarretia
Navarretia leucocephala Benth. subsp. *bakeri* (H. Mason) A.G. Day, Baker's navarretia, **G4T2S2.1**

Navarretia leucocephala Benth. subsp. *pauciflora* (H. Mason) A.G. Day, fewflower navarretia, few-flowered navarretia, **G4T1S1.1**
Navarretia mellita Greene, skunk navarretia, honeyscented pincushionplant
Navarretia pubescens (Benth.) Hook. & Arn., downy pincushionplant, purple navarretia
Navarretia rosulata Brand, San Anselmo navarretia, Marin County navarretia, **G2?S2?**
Navarretia squarrosa (Eschsch.) Hook. & Arn., skunkbush, skunkweed
Navarretia subuligera Greene, awl-leaf pincushionplant, awl-leaved navarretia, **G4S3.3**
Navarretia tagetina Greene, Navarretia, marigold navarretia, marigold pincushionplant
Navarretia viscidula Benth., sticky navarretia, sticky pincushionplant
Phlox gracilis (Hook.) Greene, Slender Phlox, Microsteris, Beggar's gilia, annual phlox

POLYGALACEAE

Polygala californica Nutt., California milkwort, Milkwort

POLYGONACEAE

Chorizanthe clevelandii Parry, Cleveland's spineflower
Chorizanthe membranacea Benth., pink spineflower
Chorizanthe polygonoides Torr. & A. Gray, knotweed spineflower
Chorizanthe polygonoides Torr. & A. Gray var. *polygonoides*, knotweed spineflower
Chorizanthe stellulata Benth., starlet spineflower
Eriogonum compositum Benth. var. *compositum*, arrow-leaf buckwheat, arrowleaf buckwheat
Eriogonum dasyanthemum Torr. & A. Gray, chaparral buckwheat
Eriogonum fasciculatum Benth., California buckwheat, Eastern Mojave buckwheat
Eriogonum fasciculatum Benth. var. *foliolosum* (Nutt.) Abrams, Eastern Mojave buckwheat, Red-topped Buckwheat, California buckwheat
Eriogonum gracile Benth., slender woolly buckwheat, slender buckwheat
Eriogonum luteolum Greene, golden buckwheat, Wicker Buckwheat, goldencarpet buckwheat
Eriogonum luteolum Greene var. *caninum* (Greene) Reveal, Tiburon buckwheat, **G5T3QS3.2**

Eriogonum luteolum Greene var. *luteolum*, goldencarpet buckwheat, golden buckwheat

Eriogonum nervulosum (S. Stokes) Reveal, Snow Mountain buckwheat, Snow Mtn. buckwheat, **G2S2.2**

Eriogonum nudum Benth., Nude Buckwheat, naked buckwheat

Eriogonum nudum Benth. var. *auriculatum* (Benth.) Jeps., Nude Buckwheat, naked buckwheat

Eriogonum nudum Benth. var. *nudum*, naked buckwheat, Naked-stemmed Eriogonum, Nude Buckwheat

Eriogonum nudum Benth. var. *oblongifolium* S. Watson, naked buckwheat, oblong-leaved buckwheat

Eriogonum roseum Durand & Hilg., wand buckwheat

Eriogonum tripodum Greene, tripod buckwheat, **G3S3.2**

Eriogonum umbellatum Torr., sulphur buckwheat, sulphur-flower buckwheat

Eriogonum umbellatum Torr. var. *bahiiforme* (Torr. & A. Gray) Jeps., bay buckwheat, sulphur-flower buckwheat, sulphur buckwheat, **G5T3S3.2**

Eriogonum wrightii Benth., bastardsage, Wright's Buckwheat

Eriogonum wrightii Benth. var. *trachygonum* (Benth.) Jeps., Wright's buckwheat, Wright's Buckwheat, bastardsage

Polygonum amphibium L., Swamp Knotweed, water smartweed, water knotweed

Polygonum amphibium L. var. *emersum* Michx., Swamp Knotweed, longroot smartweed, Smartweed, Water smartweed, kelp

Polygonum arenastrum Boreau, Dooryard Knotweed, oval-leaf knotweed, common knotweed

Polygonum bolanderi W.H. Brewer, Bolander's polygonum, Bolander's knotweed

Polygonum californicum Meissner, California knotweed

Polygonum douglasii Greene, Douglas' knotweed

Polygonum douglasii Greene subsp. *spergulariiforme* (Meissner) J.C. Hickman, scatter knotweed, spurge knotweed, Spurry Knotweed

Polygonum lapathifolium L., curlytop knotweed, willow weed, Willow-Weed, Willow smartweed, Common knotweed

Polygonum marinense T. Mert. & P.H. Raven, Marin knotweed, **G1QS1.1**

Polygonum parryi Greene, Parry's knotweed

Polygonum punctatum J.E. Elliott, Water Smartweed, dotted smartweed, punctate smartweed, Common water smartweed

Pterostegia drymarioides F.E. Fisch. & C.A. Mey., Pterostegia, woodland pterostegia, fairy mist

Rumex maritimus L., golden dock

Rumex occidentalis S. Watson, western dock

Rumex salicifolius Weinm., willow dock, Willow-leaved Dock

Rumex salicifolius Weinm. var. *denticulatus* Torr., toothed willow dock, willow dock, California Dock, Smooth-Valved Willow Dock

Rumex salicifolius Weinm. var. *salicifolius*, Willow-leaved Dock, willow dock

PORTULACACEAE

Calandrinia breweri S. Watson, Brewer's calandrinia, Brewer's redmaids, **G4S3.2?**

Calandrinia ciliata (Ruiz & Pav.) DC., red-maids, red maids, Redmaids

Calyptridium quadripetalum S. Watson, four-petaled pussypaws, **G3S3.3**

Calyptridium roseum S. Watson, rosy pussypaws, **LH?**

Claytonia exigua Torr. & A. Gray, serpentine springbeauty, little spring beauty

Claytonia exigua Torr. & A. Gray subsp. *exigua*, little spring beauty, serpentine springbeauty, viridis

Claytonia gypsophiloides F.E. Fisch. & C.A. Mey., gypsum spring beauty, gypsum springbeauty

Claytonia parviflora Hook., streambank springbeauty, Miner's lettuce, narrow-leaved miner's lettuce

Claytonia parviflora Hook. subsp. *parviflora*, Utah Miner's Lettuce, narrow-leaved miner's lettuce, streambank springbeauty, miner's lettuce

Claytonia perfoliata Willd., miner's lettuce, Miner's Lettuce

Claytonia perfoliata Willd. subsp. *mexicana* (Rydb.) J.M. Miller & K.L. Chambers, southern miner's lettuce, miner's lettuce
Claytonia perfoliata Willd. subsp. *perfoliata*, miner's lettuce, Claytonia
Claytonia rubra (Howell) Tidestrom, red-stemmed spring beauty, redstem springbeauty
Lewisia rediviva Pursh, bitter root
Montia fontana L., water chickweed, annual water minerslettuce, Water Montia
Montia linearis (Hook.) Greene, narrowleaf minerslettuce, Linear-Leaved Montia, narrow-leaved water chickweed

POTAMOGETONACEAE

Potamogeton diversifolius Raf., Rafinesque's pondweed, diverse-leaved pondweed, waterthread pondweed
Potamogeton nodosus Poir., longleaf pondweed, long-leaved pondweed, Pondweed
Potamogeton pectinatus L., Pondweed, fennel-leaved pondweed, fennel pondweed
Potamogeton pusillus L., small pondweed
Ruppia maritima L., Ditchgrass or Wigeon Grass, ditch grass, widgeongrass

PRIMULACEAE

Dodecatheon hendersonii A. Gray, mosquito bills, foothill shooting star, Shooting Star
Trientalis latifolia Hook., Star-flower, woodland star, Western star flower

RANUNCULACEAE

Actaea rubra (Ait.) Willd., red baneberry, baneberry, Bearberry, western baneberry
Anemone oregana A. Gray, Oregon anemone, blue windflower, Western Wood Anemone
Aquilegia eximia Planchon, Van Houtte's columbine, VanHoutte's columbine
Aquilegia formosa F. E. Fisch, western columbine, Crimson Columbine, Sitka columbine, Columbine
Clematis lasiantha Nutt., chaparral clematis, pipestem clematis, pipestem
Clematis ligusticifolia Nutt., Virgin's bower, western white clematis, yerba de chiva, Western virgin's bower, creek clematis

Delphinium decorum F.E. Fisch. & C.A. Mey., coastal larkspur, Coast larkspur, Larkspur
Delphinium hesperium A. Gray, western larkspur, foothill larkspur
Delphinium hesperium A. Gray subsp. *hesperium*, foothill larkspur, western larkspur
Delphinium hesperium A. Gray subsp. *pallescens* (Ewan) F.H. Lewis & Epling, pale western Larkspur, Western Larkspur, foothill larkspur
Delphinium nudicaule Torr. & A. Gray, red larkspur, canyon larkspur
Delphinium patens Benth., spreading larkspur, zigzag larkspur
Delphinium patens Benth. subsp. *patens*, spreading larkspur, zigzag larkspur
Delphinium uliginosum Curran, swamp larkspur,
G3S3.2
Delphinium variegatum Torr. & A. Gray, royal larkspur
Delphinium variegatum Torr. & A. Gray subsp. *variegatum*, royal larkspur
Isopyrum occidentale Hook. & Arn., western false rue anemone
Myosrus apetalus C. Gay, bristly mousetail, mouse-tail
Myosrus minimus L., Common mouse tail, little mouse-tail, tiny mousetail
Ranunculus aquatilis L., whitewater crowfoot
Ranunculus aquatilis L. var. *capillaceus* (Thuill.) DC., whitewater crowfoot
Ranunculus aquatilis L. var. *hispidulus* E. Drew, whitewater crowfoot
Ranunculus californicus Benth., California buttercup, common buttercup
Ranunculus canus Benth., Great valley buttercup, Sacramento Valley buttercup, Hartweg's buttercup
Ranunculus hebecarpus Hook. & Arn., Slender annual buttercup, delicate buttercup, Pubescent-fruited Buttercup
Ranunculus lobbii (Hiern) A. Gray, Lobb's buttercup, Buttercup, Lobb's aquatic buttercup,
G4S3.2
Ranunculus occidentalis Nutt., western buttercup
Ranunculus orthorhynchus Hook., straight-beaked buttercup, straightbeak buttercup, Bloomer's Buttercup
Ranunculus orthorhynchus Hook. var. *bloomeri* (S. Watson) L.D. Benson, Bloomer's beaked buttercup, Bloomer's Buttercup

- Ranunculus pusillus* Poir., low spearwort, low buttercup
Ranunculus uncinatus D. Don, Hook-Seeded Buttercup, hooked-fruit buttercup, woodland buttercup
Thalictrum fendleri A. Gray, Meadow - Rue, Fendler's meadow-rue
Thalictrum fendleri A. Gray var. *polycarpum* Torr., Meadow Rue, Fendler's meadow-rue, Torrey's meadow-rue

RHAMNACEAE

- Ceanothus confusus* J.T. Howell, Rincon Ridge ceanothus, **G2S2.2**
Ceanothus cuneatus (Hook.) Nutt., buckbrush, buck brush, Wedgeleaf ceanothus
Ceanothus cuneatus (Hook.) Nutt. var. *cuneatus*, buckbrush, buck brush
Ceanothus dentatus Torr. & A. Gray, dwarf sand-scrub ceanothus, sandscrub ceanothus, Dwarf ceanothus, **L2**
Ceanothus divergens Parry, Calistoga ceanothus, **G2S2.2**
Ceanothus foliosus Parry, wavy-leaved ceanothus, wavyleaf ceanothus
Ceanothus foliosus Parry var. *foliosus*, wavy-leaved ceanothus, wavyleaf ceanothus
Ceanothus incanus Torr. & A. Gray, coast whitethorn
Ceanothus integerrimus Hook. & Arn., deerbrush, deer brush
Ceanothus jepsonii Greene, Musk Bush, Jepson ceanothus, musk brush
Ceanothus jepsonii Greene var. *albiflorus* J.T. Howell, white-flowered musk brush, Jepson ceanothus
Ceanothus jepsonii Greene var. *jepsonii*, musk brush, Jepson ceanothus
Ceanothus oliganthus Nutt., hairy ceanothus
Ceanothus oliganthus Nutt. var. *sorediatus* (Hook. & Arn.) C.L. Schmidt, jim brush
Ceanothus parryi Trel., Parry ceanothus
Ceanothus prostratus Benth., pinemat, squawcarpet (seldom used historical name, derogatory), squawcarpet (seldom used historical name, derogatory), Mahala-Mats, **L1**
Ceanothus pumilus Greene, dwarf ceanothus, Siskiyou mat, **L3**

- Ceanothus purpureus* Jeps., Napa ceanothus, hollyleaf ceanothus, holly-leaf ceanothus, holly-leaved ceanothus, **G2S2.2**
Ceanothus sonomensis J.T. Howell, Sonoma ceanothus, **G2S2.2**
Ceanothus velutinus Hook., Snow brush, Tobacco brush, snowbrush, snowbrush ceanothus, tobacco brush
Ceanothus velutinus Hook. var. *hookeri* M.C. Johnst., Hooker's ceanothus, Hooker's tobacco brush
Rhamnus californica Eschsch., Coffee Berry, California coffeeberry
Rhamnus californica Eschsch. subsp. *californica*, California coffeeberry
Rhamnus crocea Nutt., redberry buckthorn, redberry
Rhamnus ilicifolia Kellogg, hollyleaf redberry, Evergreen Buckthorn
Rhamnus tomentella Benth., hoary coffeeberry
Rhamnus tomentella Benth. subsp. *crassifolia* (Jeps.) Sawyer, serpentine hoary coffeeberry, Velvet leaf coffeeberry
Rhamnus tomentella Benth. subsp. *tomentella*, hoary coffeeberry, Chaparral coffee berry

ROSACEAE

- Acaena pinnatifida* Ruiz & Pav. var. *californica* (Bitter) Jeps, California acaena, California sheepburr, **L3**
Adenostoma fasciculatum Hook. & Arn., chamise
Agrimonia gryposepala Wallr., agrimony, common agrimony
Amelanchier alnifolia (Nutt.) Nutt., Saskatoon serviceberry, service-berry
Amelanchier alnifolia (Nutt.) Nutt. var. *semiintegrifolia* (Hook.) C.L. Hitchc., Pacific serviceberry, service-berry
Amelanchier utahensis Koehne, Service-Berry, Utah service-berry, western serviceberry, Pale-leaved serviceberry
Aphanes occidentalis (Nutt.) Rydb., Western Lady's Mantle, ladie's mantle, Lady's mantle
Cercocarpus betuloides Torr. & A. Gray, Mountain mahogany, birch-leaf mountain-mahogany
Cercocarpus betuloides Torr. & A. Gray var. *betuloides*, mountain mahogany, birch-leaf mountain-mahogany
Fragaria vesca L., woodland strawberry, Wood Strawberry, California Strawberry, Wild Strawberry

Heteromeles arbutifolia (Lindl.) Roem., toyon,
Toyon, christmas berry, Christmas Berry
Holodiscus discolor (Pursh) Maxim., cream
bush, Ocean-spray, oceanspray
Horkelia californica Cham. & Schltld.,
California horkelia
Horkelia californica Cham. & Schltld. subsp.
dissita (Crum) Ertter, California horkelia
Malus fusca (Raf.) C.K. Schneid., Oregon crab
apple, Oregon crabapple
Oemleria cerasiformis (Hook. & Arn.) J.W.
Landon, Indian plum, oso berry
Physocarpus capitatus (Pursh) Kuntze, Pacific
ninebark, Western ninebark, Ninebark
Potentilla anserina L., Silverweed, silver-
weed cinquefoil, **L3**
Potentilla anserina L. subsp. *pacifica*
(Howell) Rousi, Pacific potentilla,
silverweed, **L3**
Potentilla glandulosa Lindl., Glandular five-
finger, Sticky Cinquefoil, gland
cinquefoil, Common cinquefoil
Potentilla glandulosa Lindl. subsp.
glandulosa, sticky cinquefoil
Prunus emarginata (Hook.) Walp., bitter
cherry
Prunus ilicifolia (Nutt.) Walp., hollyleaf
cherry, Holly-leaved Cherry, holly-leaf
cherry
Prunus subcordata Benth., Klamath plum,
Sierra plum
Prunus virginiana L. var. *demissa* (Nutt.)
Torr., western chokecherry, Chokecherry,
Western Choke Cherry, western choke-
cherry
Rosa californica Cham. & Schltld., California
wildrose, California wild rose
Rosa gymnocarpa Nutt., dwarf rose, wood
rose
Rosa spithamea S. Watson, ground rose,
Sonoma Rose
Rubus leucodermis Torr. & A. Gray, western
raspberry, White-Stemmed Raspberry,
white-bark raspberry
Rubus parviflorus Nutt., western thimbleberry,
thimbleberry
Rubus ursinus Cham. & Schltld., Pacific
blackberry, California blackberry

RUBIACEAE

Cephalanthus occidentalis L. var. *californicus*
Benth., Button bush, California buttonbush,
Buttonbush
Galium andrewsii A. Gray, phlox-leaved bedstraw,
Needlemat galium, phloxleaf bedstraw
Galium andrewsii A. Gray subsp. *andrewsii*,
phlox-leaved bedstraw, Andrews' bedstraw
Galium andrewsii A. Gray subsp. *intermedium*
Dempster & Stebb., phloxleaf bedstraw,
phlox-leaved bedstraw, **LH?**
Galium angustifolium Nutt. subsp. *angustifolium*,
narrowleaf bedstraw, narrow-leaved bedstraw,
LH?
Galium aparine L., common bedstraw, Goose
Grass, Bedstraw, stickywilly, cleavers
Galium bolanderi A. Gray, Bolander's bedstraw,
Bolander galium
Galium californicum Hook. & Arn., California
bedstraw
Galium californicum Hook. & Arn. subsp.
californicum, California bedstraw
Galium porrigens Dempster, Nuttall's bedstraw,
Climbing Bedstraw, graceful bedstraw
Galium porrigens Dempster var. *porrigens*, oval-
leaved bedstraw, *Climbing Bedstraw*,
Bedstraw, graceful bedstraw
Galium porrigens Dempster var. *tenue* (Dempster)
Dempster, graceful bedstraw
Galium tricornutum Dandy, rough bedstraw,
roughfruit corn bedstraw
Galium triflorum Michx., bedstraw, sweet-scented
bedstraw, fragrant bedstraw, Sweet bedstraw

RUTACEAE

Ptelea crenulata Greene, Western hoptree, hop
tree, California hoptree

SALICACEAE

Populus balsamifera L. subsp. *trichocarpa* (Torrey
& A. Gray) Brayshaw, black cottonwood
Populus fremontii S. Watson subsp. *fremontii*,
Fremont cottonwood, Fremont's Cottonwood,
cottonwood
Salix breweri Bebb, Brewer's willow, serpentine
willow
Salix exigua Nutt., sandbar willow, Narrow-leaved
Willow, narrowleaf willow
Salix hindsiana Benth., sandbar willow
Salix laevigata Bebb, red willow, Polished Willow
Salix lasiolepis Benth., arroyo willow

- Salix lucida*, shining willow
Salix lucida Muhlenb. subsp. *lasiandra*
 (Benth.) E. Murray, yellow willow,
 Pacific willow, shining willow
Salix melanopsis Nutt., dusky willow, **LH?**
Salix scouleriana Hook., Scouler's willow,
 Nuttall willow, Scouler willow
Salix sitchensis Bong., Sitka willow, Coulter
 Willow

SAXIFRAGACEAE

- Boykinia occidentalis* Torr. & A. Gray,, Brook
 Foam, western boykinia, coastal
 brookfoam
Heuchera micrantha Lindl., crevice alumroot,
 Alum-root
Heuchera micrantha Lindl. var. *erubescens*
 (A. Braun & C.D. Bouche) Rosend.,
 crevice alumroot
Lithophragma affine A. Gray, Woodland star,
 common woodland star, San Francisco
 woodland-star
Lithophragma bolanderi A. Gray, Bolander's
 woodland star, Sierra star, Hillstar,
 Bolander's woodland-star
Lithophragma heterophyllum (Hook. & Arn.)
 Torr. & A. Gray, hillside woodland-star,
 Hill Star, woodland star
Lithophragma parviflorum (Hook.) Torr. & A.
 Gray, Prairie star, smallflower woodland-
 star, pink woodland star
Saxifraga californica Greene, California
 saxifrage, Greene's Saxifrage
Saxifraga nidifica Greene var. *nidifica*, Peak
 saxifrage, Peak Saifrage
Tellima grandiflora (Pursh) Lindl., bigflower
 tellima, fringe cups

SCROPHULARIACEAE

- Antirrhinum cornutum* Benth., Spurred
 snapdragon
Antirrhinum kelloggii Greene, Kellogg's
 snapdragon, climbing snapdragon, Lax
 Snapdragon
Antirrhinum vexillo-calyculatum Kellogg, sail-
 flower snapdragon, Brewer's snapdragon
Antirrhinum vexillo-calyculatum Kellogg
 subsp. *vexillo-calyculatum*, sail-flower
 snapdragon, Wiry Snapdragon
Antirrhinum virga A. Gray, tall snapdragon,
G3S3.3?

- Castilleja affinis* Hook. & Arn., Indian paintbrush
Castilleja affinis Hook. & Arn. subsp. *affinis*, coast
 Indian paintbrush, Wight's Indian Paint-brush,
 Indian paintbrush
Castilleja affinis Hook. & Arn. subsp. *neglecta*
 (E.M. Zeile) Chuang & Heckard, Tiburon
 Indian paintbrush, **G4G5T1S1.2**
Castilleja ambigua Hook. & Arn., johnny-nip,
 johnny nip, Paintbrush Orthocarpus
Castilleja ambigua Hook. & Arn. subsp. *ambigua*,
 johnny nip, johnny-nip
Castilleja applegatei Fernald, Wavy-Leaved
 Paintbrush, Wavy-leaved indian paintbrush,
 pine Indian paintbrush, Pine paintbrush, wavy-
 leaf paintbrush
Castilleja applegatei Fernald subsp. *martinii*
 (Abrams) Chuang & Heckard, wavyleaf Indian
 paintbrush, Martin's paintbrush
Castilleja attenuata (A. Gray) Chuang & Heckard,
 valley tassels, narrow-leaved owl's clover
Castilleja densiflora (Benth.) Chuang & Heckard,
 dense-flower owl's-clover, denseflower Indian
 paintbrush, Owl's Clover
Castilleja densiflora (Benth.) Chuang & Heckard
 subsp. *densiflora*, dense-flower owl's-clover,
 denseflower Indian paintbrush, owl's clover
Castilleja exserta (A. Heller) Chuang & Heckard,
 purple owl's-clover, Owl's clover, purple owl's
 clover
Castilleja exserta (A. Heller) Chuang & Heckard
 subsp. *exserta*, Pale purple owl's clover,
 Common Owl's Clover, exserted Indian
 paintbrush, purple owl's clover
Castilleja foliolosa Hook & Arn., Woolly
 Paintbrush, Texas paintbrush, woolly Indian
 paintbrush
Castilleja lacera (Benth.) Chuang & Heckard, Cut-
 leaved owl's clover, cutleaf Indian paintbrush,
 foothill owl's clover, **LH?**
Castilleja latifolia Hook. & Arn., Monterey Indian
 paintbrush, Seaside Paintbrush, **G3S3.3**
Castilleja minor (A. Gray) A. Gray, lesser Indian
 paintbrush, little paintbrush
Castilleja minor (A. Gray) A. Gray subsp. *spiralis*
 (Jeps.) Chuang & Heckard, lesser paintbrush,
 lesser Indian paintbrush
Castilleja rubicundula (Jeps.) Chuang & Heckard,
 cream sacs
Castilleja rubicundula (Jeps.) Chuang & Heckard
 subsp. *lithospermoides* (Benth.) Chuang &
 Heckard, cream sacs

- Castilleja rubicundula* (Jeps.) Chuang & Heckard subsp. *rubicundula*, pink creamsacs, cream sacs, **G5T2S2.2**
- Castilleja subinclusa* Greene, Franciscan Paint Brush, longleaf Indian paintbrush, long-leaf paintbrush
- Castilleja subinclusa* Greene subsp. *franciscana* (Pennell) Chuang & Heckard, longleaf Indian paintbrush, Franciscan Paint Brush, Franciscan paintbrush
- Collinsia greenei* A. Gray, Greene's collinsia, Greene's blue eyed Mary
- Collinsia heterophylla* Buist, purple Chinese houses, Chinese houses
- Collinsia sparsiflora* F.E. Fisch. & C.A. Mey., few-flowered collinsia, spinster's blue eyed Mary
- Collinsia sparsiflora* F.E. Fisch. & C.A. Mey. var. *arvensis* (Greene) Jeps., field collinsia, spinster's blue eyed Mary
- Collinsia sparsiflora* F.E. Fisch. & C.A. Mey. var. *collina* (Jeps.) Newsom, spinster's blue eyed Mary, hillside collinsia
- Collinsia sparsiflora* F.E. Fisch. & C.A. Mey. var. *sparsiflora*, few-flowered collinsia, spinster's blue eyed Mary
- Collinsia tinctoria* Benth., sticky Chinese houses, tincture plant, **L3**
- Cordylanthus mollis* A. Gray, soft bird's beak, soft bird's-beak, **L3**
- Cordylanthus mollis* A. Gray subsp. *mollis*, soft bird's-beak, **G2T1S1.1**
- Cordylanthus pilosus*, hairy bird's-beak
- Cordylanthus pilosus* A. Gray subsp. *pilosus*, hairy bird's beak
- Cordylanthus pringlei* A. Gray, Pringle's bird's beak, **L3**
- Cordylanthus tenuis* A. Gray, slender bird's beak
- Cordylanthus tenuis* A. Gray subsp. *brunneus* (Jepson) Munz, serpentine bird's beak, serpentine bird's-beak, **G4G5T3S3.3**
- Gratiola ebracteata* Benth., bractless hedgehyssop, Bractless Hedge-Hyssop, common hedge-hyssop
- Keckiella corymbosa* (Benth.) Straw, redwood keckiella, Red beardtongue
- Keckiella lemmonii* (A. Gray) Straw, Lemmon beardtongue, bush beardtongue, Shrubby penstemon, Lemmon's keckiella
- Limosella acaulis* Sessé & Moc., Broad-Leaved Mudwort, Owyhee mudwort, Southern mudwort, stemless mudwort
- Linaria canadensis* (L.) Dum.-Cours., toadflax, blue toad-flax, Toad Flax
- Pedicularis densiflora* Hook., Indian warrior
- Penstemon centranthifolius* Benth., scarlet bugler
- Penstemon heterophyllus* Lindl., foothill penstemon, bunchleaf penstemon
- Penstemon heterophyllus* Lindl. var. *heterophyllus*, foothill penstemon
- Penstemon heterophyllus* Lindl. var. *purdyi* (D.D. Keck) McMinn, Purdy's foothill penstemon
- Penstemon newberryi* A. Gray, Mountain pride, **L2**
- Penstemon newberryi* A. Gray var. *sonomensis* (Greene) Jeps., Sonoma beardtongue, **G4T1S1.3**
- Scrophularia californica* Cham. & Schldl., Bee-plant, California figwort, California Bee-plant
- Scrophularia californica* Cham. & Schldl. subsp. *floribunda* (Greene) R.J. Shaw, Figwort, California figwort, bee plant, common California figwort
- Tonella tenella* (Benth.) A. Heller, innocence, lesser baby innocence, Small-flowered tonella
- Triphysaria eriantha* (Benth.) Chuang & Heckard, butter 'n' eggs, johnny-tuck, Johnnytuck
- Triphysaria eriantha* (Benth.) Chuang & Heckard subsp. *eriantha*, johnny-tuck, butter 'n' eggs
- Triphysaria pusilla* (Benth.) Chuang & Heckard, dwarf owl's-clover, little owl's clover, Dwarf Owl's Clover
- Triphysaria versicolor* F.E. Fisch. & C.A. Mey., yellowbeak owl's-clover, yellow owl's clover
- Triphysaria versicolor* F.E. Fisch. & C.A. Mey. subsp. *faucibarbata* (A. Gray) Chuang & Heckard, yellow owl's clover, yellowbeak owl's-clover
- Triphysaria versicolor* F.E. Fisch. & C.A. Mey. subsp. *versicolor*, yellowbeak owl's-clover, yellow owl's clover
- Veronica americana* (Raf.) Benth., Brooklime, American speedwell, American brooklime
- Veronica peregrina* L. subsp. *xalapensis* (Kunth) Pennell, hairy purslane speedwell, Neckweed, Purslane Speedwell, Speedwell
- Veronica serpyllifolia* L. subsp. *humifusa* (Dicks.) Syme, bright-blue speedwell, brightblue speedwell, Thyme-leaved Speedwell, Sprawling Speedwell, **LH?**

SOLANACEAE

- Datura wrightii* Regel, toluaca, Western Jimsonweed, sacred thorn-apple, jimsonweed
Nicotiana attenuata Torr., coyote tobacco
Nicotiana quadrivalvis Pursh, Indian tobacco
Solanum americanum Mill., American black nightshade, common nightshade, Small-flowered Nightshade, white nightshade
Solanum parishii A. Heller, Nightshade, Parish's nightshade, Parish's purple nightshade
Solanum umbelliferum Eschsch., bluewitch nightshade, Bluewitch, blue-witch nightshade, Blue Witch
Solanum xanti A. Gray, purple nightshade, chaparral nightshade, Nightshade

STERCULIACEAE

- Fremontodendron californicum* (Torr.) Coville, Flannel bush, California flannelbush, California fremontia
Fremontodendron californicum (Torr.) Coville subsp. *californicum*, California fremontia

THEOPHRASTACEAE

- Samolus parviflorus* Raf., water pimperl, water-pimperl

TYPHACEAE

- Sparganium erectum* L. subsp. *stoloniferum* (Graebn.) C.D.K. Cook & M.S. Nicholls, simplestem bur-reed, stoloned bur-reed, Bur-reed
Sparganium eurycarpum Engelm. subsp. *eurycarpum*, bur-reed
Typha angustifolia L., narrowleaf cattail, nail rod, cattail, narrow-leaf cattail
Typha latifolia L., broadleaf cattail, Common cattail, soft flag, cattail

URTICACEAE

- Hesperocnide tenella* Torr., Western nettle, western stinging nettle, western stingingnettle
Urtica dioica L., Stinging nettle
Urtica dioica L. subsp. *holosericea* (Nutt.) Thorne, giant creek nettle, hoary nettle, Mountain Nettle, Nettle, Stinging Nettle

VALERIANACEAE

- Plectritis brachystemon* F.E. Fisch. & C.A. Mey., short-spurred plectritis
Plectritis ciliosa (Greene) Jeps., long-spurred plectritis, longspur seablush
Plectritis ciliosa (Greene) Jeps. subsp. *ciliosa*, long-spurred plectritis, longspur seablush
Plectritis ciliosa (Greene) Jeps. subsp. *insignis* (Suksd.) D. Morey, showy plectritis, longspur seablush
Plectritis congesta (Lindl.) A. DC., sea blush, shortspur seablush
Plectritis macrocera Torr. & A. Gray, White Plectritis, long-horn plectritis, Plectritis, longhorn plectritis

VERBENACEAE

- Phyla nodiflora* (L.) Greene, Lippia, turkey tangle fogfruit, common lippia
Phyla nodiflora (L.) Greene var. *nodiflora*, common lippia
Verbena lasiostachys Link, Vervain, Common verbena, western verbena, western vervain
Verbena lasiostachys Link var. *scabrida* Mold., robust vervain

VIOLACEAE

- Viola douglasii* Steud., Douglas' violet, Douglas' golden violet
Viola lobata Benth., Yellow violet, Pine violet, moose-horn violet
Viola lobata Benth. subsp. *integrifolia* (S. Watson) R.J. Little, pine violet, Yellow violet, delta-leafed forest violet
Viola lobata Benth. subsp. *lobata*, pine violet, moose-horn violet
Viola ocellata Torr. & A. Gray, western heart's ease, pinto violet, Twoeyed violet
Viola pedunculata Torr. & A. Gray, johnny jump-up, Johnny-jump-up, California Golden Violet
Viola purpurea Kellogg, Mountain violet, goosefoot violet
Viola purpurea Kellogg subsp. *purpurea*, goosefoot violet
Viola purpurea Kellogg subsp. *quercetorum* (M.S. Baker & J. Clausen) R.J. Little, goosefoot yellow violet, goosefoot violet

VISCACEAE

- Arceuthobium campylopodum* Engelm.,
western dwarf mistletoe, Pine Mistletoe,
Golden Mistletoe, pine dwarf-mistletoe
Arceuthobium occidentale Engelm., foothill-
pine dwarf mistletoe, Digger pine
mistletoe (seldom used historical name,
derogatory), digger pine dwarf-mistletoe
(seldom used historical name, derogatory)
Phoradendron densum Trel., dense mistletoe
Phoradendron villosum (Nutt.) Nutt., Pacific
mistletoe, oak mistletoe, Hairy Mistletoe

VITACEAE

- Vitis californica* Benth., California grape,
California wild grape

ZANNICHELLIACEAE

- Zannichellia palustris* L., horned pondweed

APPENDIX B

A CHECKLIST OF THE EXOTIC VASCULAR FLORA OF NAPA COUNTY, CA, U.S.A

The checklist is arranged alphabetically by family and species. All listed taxa are angiosperms. Nomenclature generally follows Hrusa (2005) and Jepson Flora Project (2005). Common names are generally from Calflora (2000). All plants listed are California exotics.

AIZOACEAE

Carpobrotus edulis (L.) N.E. Br., Hottentot Fig,
hottentot-fig, sea fig, Iceplant
Cypselea humifusa Turp., panal

AMARANTHACEAE

Amaranthus albus L., tumbleweed, pigweed
amaranth
Amaranthus deflexus L., largefruit amaranth,
Amaranth, low amaranth, large-fruited
amaranth
Amaranthus hybridus L., slim amaranth, Slender
pigweed
Amaranthus retroflexus L., red-root pigweed,
green amaranth, red-rooted amaranth, rough
pigweed, redroot amaranth

APIACEAE

Ammi majus L., bishop's weed, large bullwort
Anthriscus caucalis M. Bieb, bur-chervil, burr
chervil, Bur Chevril
Conium maculatum L., poison hemlock
Daucus carota L., Wild carrot, carrot, Queen
Anne's lace
Foeniculum vulgare Mill., fennel, sweet fennel,
Biscuit root
Petroselinum crispum (Mill.) A.W. Hill, parsley
Scandix pecten-veneris L., Venus' needle,
shepherdsneedle, Shepherd's needle

Torilis arvensis (Hudson) Link, Hedge parsley,
field hedge-parsley, Field hedge parsley,
spreading hedgeparsley
Torilis arvensis (Hudson) Link subsp. *arvensis*,
field hedge-parsley
Torilis nodosa (L.) Gaertn., Hedge Parsley,
knotted hedgeparsley, knotted hedge-
parsley, Wild parsley

APOCYNACEAE

Vinca major L., greater periwinkle, periwinkle,
Vinca, bigleaf periwinkle

ARACEAE

Zantedeschia aethiopica (L.) Spreng., calla lily,
Common Calla, callalily

ARALIACEAE

Hedera helix L., English ivy

ASCLEPIADACEAE

Araujia sericifera Brot., Bladderflower

ASTERACEAE

Acroptilon repens (L.) DC., Russian knapweed
Anaphalis margaritacea (L.) Benth. & Hook.,
pearly everlasting
Anthemis cotula L., stinking chamomile,
Mayweed, Dog Fennel, mayweed, dog-
fennel

- Calendula arvensis* L., field marigold, field-marigold
Calendula officinalis L., pot-marigold, pot marigold
Carduus pycnocephalus L., Italian thistle
Carduus tenuiflorus Curtis, Slender-flowered Thistle, Italian thistle, winged plumeless thistle, winged thistle
Carthamus baeticus (Boiss. & Reuter) Nyman, smooth distaff thistle
Carthamus lanatus L., distaff thistle, woolly distaff thistle
Centaurea calcitrapa L., red star-thistle, Purple star thistle
Centaurea cyanus L., garden cornflower, Batchelor button
Centaurea iberica Spreng., Iberian knapweed
Centaurea maculosa Lam., spotted knapweed
Centaurea melitensis L., tocalote, Napa star thistle, Napa Thistle, Maltese star-thistle
Centaurea solstitialis L., Barnaby's Thistle, yellow-starthistle, yellow star-thistle, yellow star thistle
Chamomilla suaveolens (Pursh) Rydb., pineapple weed, Common Pineapple-Weed
Chondrilla juncea L., skeleton weed, hogbite
Cichorium intybus L., chicory
Cirsium arvense (L.) Scop., Canada thistle
Cirsium vulgare (Savi) Ten., bull thistle, bullthistle
Conyza bonariensis (L.) Cronq., asthmaweed, flax-leaved fleabane, Horseweed, South American horseweed
Cotula australis (Sieber) Hook. f., Australian waterbuttons, Australian brass-buttons, Australian brass button, Australian Cotula, Brass Buttons
Cotula coronopifolia L., brass-buttons, common brassbuttons, brass buttons
Cynara cardunculus L., artichoke thistle, cardoon
Filago gallica L., Mediterranean herba impia, Filago, narrow-leaved filago
Filago pyramidata L. var. *pyramidata*, Filago, herba impia
Gnaphalium japonicum Thunb., Japanese cudweed
Gnaphalium luteo-album L., Everlasting Cudweed, Fragrant everlasting, weedy cudweed, common cudweed
Hedypnois cretica (L.) Dum.-Cours., Crete weed, Hedypnois, Cretanweed
Hypochaeris glabra L., smooth cat's ear, Smooth Cats-ear, smooth catsear
Hypochaeris radicata L., rough cat's ear, Hairy Cats-ear, hairy catsear
Lactuca saligna L., narrow-leaved wild-lettuce, willowleaf lettuce, willow lettuce
Lactuca serriola L., Prickly Wild Lettuce, prickly lettuce
Picris echioides L., bristly ox-tongue, bristly oxtongue
Rhagadiolus stellatus (L.) Gaertn., endive daisy
Scorzonera hispanica L., Spanish salsify, black salsify, Viper's grass
Senecio mikanioides Walp., German-ivy, German ivy
Senecio sylvaticus L., woodland groundsel, woodland ragwort
Senecio vulgaris L., old-man-in-the-Spring, Old man of spring, common groundsel
Silybum marianum (L.) Gaertn., milkthistle, blessed milkthistle, milk thistle
Soliva sessilis Ruiz & Pav., field burrweed, common soliva, South american soliva
Sonchus asper (L.) Hill subsp. *asper*, prickly sow thistle, prickly sow-thistle, Sow Thistle
Sonchus oleraceus L., common sow-thistle, common sowthistle, common sow thistle, Sow Thistle
Tanacetum parthenium (L.) Sch. Bip., feverfew
Taraxacum officinale Wigg., Dandelion, common dandelion, red-seeded dandelion
Tragopogon porrifolius L., salsify, Purple salsify
- BORAGINACEAE**
- Myosotis latifolia* Poir., broadleaf forget-me-not, Forget-me-not, wide-leaved forget-me-not
- BRASSICACEAE**
- Barbarea verna* (Mill.) Asch., scurvy grass, early wintercress, early winter cress, Wintercress
Barbarea vulgaris R. Br., bitter wintercress, common wintercress, yellow rocket
Brassica nigra (L.) Koch, black mustard
Brassica rapa L., field mustard, Common Mustard, rape mustard
Capsella bursa-pastoris (L.) Medikus, shepherd's purse, Shepherd's-Purse
Cardaria chalepensis (L.) Hand.-Mazz., lens-podded hoary cress

Cardaria draba (L.) Desv., hoary cress, heart-podded hoary-cress
Cardaria pubescens (C. Meyer) Jarmol., white-top, longstalk whitetop
Coronopus squamatus (Forskall) Asch., greater swine cress, greater swinecress
Descurainia sophia (L.) Webb, Flix weed, herb sophia
Hirschfeldia incana (L.) Lagr.-Fossat, Mediterranean Hoary-Mustard, short-podded mustard, shortpod mustard, Wild mustard, Summer Mustard, Mustard
Lepidium latifolium L., broad-leaved peppergrass, broadleaved pepperweed
Lobularia maritima (L.) Desv., sweet alyssum
Lunaria annua L., annual honesty, Honesty, annual moonwort
Raphanus sativus L., wild radish, cultivated radish, jointed charlock
Sinapis arvensis L., charlock, charlock mustard
Sisymbrium altissimum L., tall tumbledustard, Tumbling mustard, tumble-mustard, Tumble Mustard
Sisymbrium officinale L., hedge mustard, hedgemustard

CAPRIFOLIACEAE

Lonicera japonica Thunb., Japanese honeysuckle

CARYOPHYLLACEAE

Agrostemma githago L., corncockle, common corncockle
Cerastium glomeratum Thuill., sticky chickweed, Mouseear chickweed, Large mouse ears, mouse-eared chickweed, mouse-ear chickweed
Herniaria hirsuta L., herniaria, hairy rupturewort
Herniaria hirsuta L. subsp. *cinerea* (DC.) Cout., grey herniaria, hairy rupturewort
Polycarpon tetraphyllum (L.) L., Four-leaved Polycarp, four-leaved all-seed, fourleaf manyseed, four-leaved allseed
Silene gallica L., Windmill pink, common catchfly
Spergularia bocconei (Scheele) Merino, Sand Spurry, Boccon's sand-spurrey, Boccone's Sand Spurry, Boccone's sandspurry
Spergularia rubra (L.) J. Presl & C. Presl, red sandspurry, Sand Spurry, Ruby Sandspurry, Purple Sand Spurry

Spergularia villosa (Pers.) Cambess., Sand Spurry, hairy sand-spurrey, hairy sandspurry, Villous Sand Spurry, hairy sand spurrey
Stellaria media (L.) Vill., common chickweed, Chickweed

CHENOPODIACEAE

Beta vulgaris L., beet, common beet
Chenopodium album L., lamb's quarters, white goosefoot, Lambs-Quarters, lambsquarters
Chenopodium ambrosioides L., Mexican tea
Chenopodium botrys L., Jerusalem oak goosefoot, Jerusalem oak, goosefoot
Chenopodium multifidum L., cutleaf goosefoot, Pigweed, cut-leaved goosefoot
Chenopodium murale L., sowbane, nettle-leaf goosefoot, nettleleaf goosefoot, nettle-leaved goosefoot

CONVOLVULACEAE

Convolvulus arvensis L., bindweed, Orchard Morningglory, field bindweed

CYPERACEAE

Cyperus difformis L., variable flatsedge
Cyperus rotundus L., nutgrass

DIPSACACEAE

Dipsacus fullonum L., Fullers' Teasel, wild teasel, Fuller's teasel
Scabiosa atropurpurea L., pincushion flower, Pincushion Plant, mourningbride, Pincushions

EUPHORBIACEAE

Chamaesyce maculata (L.) Small, spotted spurge
Chamaesyce nutans (Lag.) Small, eyebane, Large spurge
Euphorbia oblongata Griseb., eggleaf spurge
Euphorbia peplus L., petty spurge
Ricinus communis L., castorbean, castor bean

FABACEAE

Acacia decurrens Willd., black wattle, Wattle, green wattle
Acacia melanoxylon R. Br., blackwood acacia
Cytisus scoparius (L.) Link, scotch broom, scotchbroom
Genista monspessulana (L.) L.A.S. Johnson, French broom

Lathyrus aphaca L., yellow pea, yellow vetchling
Lathyrus odoratus L., Garden sweet pea, sweet pea, sweetpea, Common Sweet Pea
Lathyrus sphaericus Retz., grass pea, grass peavine
Lathyrus tingitanus L., Tangier pea
Lotus corniculatus L., Broadleaf birdsfoot trefoil, Bird's-Foot-Trefoil, bird's foot trefoil, birdfoot deervetch, bird's-foot trefoil
Medicago arabica (L.) Hudson, spotted burclover, spotted medick
Medicago lupulina L., black medick
Medicago polymorpha L., Bur medic, bur clover, burclover, bur-clover, California burclover
Medicago sativa L., alfalfa
Melilotus albus Medikus, White Sweetclover
Melilotus indicus (L.) All., Sourclover
Robinia pseudoacacia L., black locust
Trifolium dubium Sibth., shamrock, Shamrock clover, suckling clover
Trifolium glomeratum L., clustered clover
Trifolium hirtum All., rose clover
Trifolium incarnatum L., crimson clover
Trifolium repens L., white clover
Trifolium subterraneum L., Sub clover, subterranean clover
Vicia benghalensis L., Vetch, reddish tufted vetch, purple vetch
Vicia cracca L., bird vetch
Vicia sativa L., spring vetch
Vicia sativa L. subsp. *nigra* (L.) Erhart, garden vetch, Spring vetch, common vetch, Smaller Common Vetch
Vicia sativa L. subsp. *sativa*, Pubescent common vetch, Vetch, garden vetch, spring vetch, Common Vetch
Vicia villosa Roth, hairy vetch
Vicia villosa Roth subsp. *varia* (Host) Corbiere, Thick-fruited Vetch, winter vetch, Woollypod vetch, smooth vetch
Vicia villosa Roth subsp. *villosa*, Woolly Vetch, winter vetch, hairy vetch

GERANIACEAE

Erodium botrys (Cav.) Bertol., broad-leaf filaree, long-beaked filaree, Big heron bill, Broadleaf filaree, longbeak stork's bill
Erodium brachycarpum (Godr.) Thell., shortfruit stork's bill, Filaree, short-fruited filaree, Foothill filaree, White-stemmed filaree

Erodium cicutarium (L.) L'HÄr., redstem filaree, redstem stork's bill, red-stemmed filaree, Coastal Heron's Bill
Erodium moschatum (L.) L'HÄr., white-stemmed filaree, whitestem filaree, musky stork's bill
Geranium dissectum L., cut-leaved geranium, Common wild geranium, Cranesbill, Wild Geranium, cutleaf geranium
Geranium molle L., dovefoot geranium, dove's-foot geranium, Woodland geranium, Crane's Bill Geranium
Geranium robertianum L., Robert's geranium, Robert geranium
Pelargonium X domesticum, regal pelargonium

HYPERICACEAE

Hypericum perforatum L., common St. Johnswort, Klamath weed, Klamathweed

IRIDACEAE

Iris germanica L., Iris
Iris pseudacorus L., pale yellow iris, water iris, Horticultural Iris

LAMIACEAE

Lamium amplexicaule L., dead-nettle, Giraffe's Head, henbit deadnettle, giraffe head, Henbit
Marrubium vulgare L., horehound, Common horehound, White Horehound
Melissa officinalis L., bee balm, common balm, Lemon balm
Mentha spicata L. var. *spicata*, spearmint
Moluccella laevis L., shell flower, shellflower

LILIACEAE

Allium neapolitanum Cirillo, white garlic
Allium paniculatum L. var. *paniculatum*, paniced onion
Allium vineale L., vineyard onion, wild garlic

LINACEAE

Linum bienne Mill., pale flax, Small-flowered Flax, Narrow-leaved flax, Narrowleaf flax, Flax

LYTHRACEAE

Lythrum hyssopifolia L., hyssop loosestrife

MALVACEAE

- Abutilon theophrasti* Medikus, velvet-leaf, velvetleaf
Lavatera cretica L., Cornish mallow, Cretan Lavatera
Malva nicaeensis All., bull mallow
Malva parviflora L., cheeseweed, cheeseweed mallow

MARTYNIACEAE

- Proboscidea louisianica* (Mill.) Thell. subsp. *louisianica*, ram's horn, common devil's claw

MOLLUGINACEAE

- Glinus lotoides* L., lotus sweetjuice
Mollugo verticillata L., green carpetweed, Indian chickweed

OLEACEAE

- Olea europaea* L., olive

ONAGRACEAE

- Gaura drummondii* (Spach) Torr. & A. Gray, Drummond's gaura, Drummond's beeblossom
Gaura sinuata Ser., wavyleaf beeblossom, Red-River gaura
Oenothera glazioviana Micheli, red-sepaled evening-primrose, redsepal evening-primrose

ORCHIDACEAE

- Epipactis helleborine* (L.) Crantz, broadleaf helleborine, helleborine

OXALIDACEAE

- Oxalis corniculata* L., yellow sorrel, creeping woodsorrel, creeping wood-sorrel
Oxalis latifolia Kunth, Mexican oxalis, broadleaf woodsorrel
Oxalis pes-caprae L., Bermuda buttercup, Bermudabuttercup, Bermuda-buttercup
Oxalis rubra A. St. Hil., windowbox woodsorrel, red oxalis

PLANTAGINACEAE

- Plantago lanceolata* L., Ribgrass, narrowleaf plantain, English plantain, Narrow-leaved plantain, Ribwort
Plantago major L., common plantain

POACEAE

- Aegilops triuncialis* L., barbed goatgrass, goatgrass
Agrostis viridis Gouan, green bentgrass, Water bent, waterbent, Bentgrass
Aira caryophyllea L., silver hairgrass, Shiver Grass, Silvery Hairgrass
Aira elegantissima Schur, elegant European hairgrass, Lace hairgrass
Ampelodesmos mauritanicus (Poir.) Durand & Schinz, common ampelodesmos
Anthoxanthum odoratum L., sweet vernalgrass, sweet vernal grass
Arundo donax L., giant reed
Avena barbata Link, slender wild oats, slender oat, Slim Oat
Avena fatua L., wild oats, Wild Oat, wildoats, Common wild oats
Brachypodium distachyon (L.) P. Beauv., purple false-brome, False brome, purple false brome
Briza minor L., little quakinggrass, little quaking grass, Little Rattlesnake Grass
Bromus catharticus Vahl, rescuegrass, rescue grass
Bromus diandrus Roth, ripgut brome, Ripgut, ripgut grass, Bromegrass
Bromus hordeaceus L., soft chess, soft brome
Bromus japonicus Murr., Japanese brome, Downy-sheathed cheat, Japanese chess, Hairy chess
Bromus madritensis L., Madrid brome, Foxtail Chess, Foxtail Brome, foxtail chess, Spanish brome
Bromus madritensis L. subsp. *rubens* (L.) Husnot, red brome, foxtail, Foxtail Chess, Foxtail Grass, Foxtail Brome
Bromus stamineus Desv., roadside brome, Harlan brome
Bromus sterilis L., Sterile brome, poverty brome
Bromus tectorum L., Downy brome, cheatgrass, Cheatgrass, downy brome, Downy brome grass, Downy Chess
Crypsis schoenoides (L.) Lam., swamp pricklegrass, Swamp Picklegrass, swamp grass
Cynodon dactylon (L.) Pers., bermuda grass, Bermudagrass
Cynosurus cristatus L., crested dogtail-grass, Crested dogtail, crested dogstail grass

- Cynosurus echinatus* L., hedgehog dogtail-grass,
Annual dogtail, Dogtail Grass, bristly
dogtail grass
- Dactylis glomerata* L., orchard-grass, Orchard
Grass, Orchardgrass
- Digitaria sanguinalis* (L.) Scop., crabgrass, hairy
crabgrass
- Echinochloa crus-galli* (L.) P. Beauv.,
Watergrass, barnyardgrass, barnyardgrass,
barnyard grass
- Elytrigia repens* (L.) Desv., quackgrass, Quack
grass
- Festuca arundinacea* Schreber, Alta Fescue, tall
fescue, Reed Fescue
- Gastridium ventricosum* (Gouan) Schinz &
Thell., nit grass
- Hainardia cylindrica* (Willd.) Greuter,
barbgrass, Monerma, Thintail, thin tail
- Holcus lanatus* L., Velvet Grass, common
velvetgrass, Velvetgrass
- Hordeum marinum* Hudson subsp. *gussoneanum*
(Parl.) Thell., Barley, Mediterranean barley
- Hordeum murinum* L., mouse barley, Farmer's
Foxtail, foxtail barley
- Hordeum murinum* L. subsp. *glaucum* (Steud.)
Tzvelev, smooth barley, foxtail, Blue foxtail
- Hordeum murinum* L. subsp. *leporinum* (Link)
Arcang., Hare barley, foxtail barley, Foxtail,
mouse barley, leporinum barley, Farmer's
Foxtail
- Hordeum vulgare* L., hordeum
- Lamarckia aurea* (L.) Moench, goldentop,
goldentop grass
- Lolium multiflorum* Lam., Italian rye-grass
- Lolium perenne* L., English rye-grass, Perennial
Ryegrass, Perennial Rye Grass
- Lolium temulentum* L., Darnel, Darnel ryegrass
- Nassella formicarum* (Del.) Barkworth, tropical
tussockgrass
- Panicum miliaceum* L., broomcorn millet,
broom-corn millet
- Paspalum dilatatum* Poir., dallisgrass, dallis
grass
- Phalaris aquatica* L., bulbous canarygrass,
Harding grass
- Phalaris caroliniana* Walter, Carolina
canarygrass
- Phalaris minor* Retz., littleseed canarygrass,
little-seed canarygrass, Mediterranean
canarygrass
- Phleum pratense* L., timothy, Cultivated
Timothy, Common Timothy
- Poa annua* L., annual bluegrass, Bluegrass,
annual blue grass
- Poa bulbosa* L., bulbous blue grass, bulbous
bluegrass
- Poa pratensis* L., Kentucky Bluegrass, Kentucky
blue grass
- Poa pratensis* L. subsp. *pratensis*, Kentucky
Bluegrass, Kentucky blue grass
- Polypogon interruptus* Kunth, ditch rabbitsfoot
grass, Beard Grass, ditch beard grass
- Polypogon maritimus* Willd., Mediterranean
rabbitsfoot grass, Mediterranean beard grass
- Polypogon monspeliensis* (L.) Desf., Rabbit's
foot, Rabbitsfoot grass, Rabbitfoot Grass,
rabbitfootgrass, annual beard grass
- Puccinellia distans* (Jacq.) Parl., weeping
alkaligrass, European alkali grass
- Secale cereale* L., Cereal rye, rye
- Setaria pumila* (Poir.) Roem. & Schult., yellow
bristlegrass
- Setaria verticillata* (L.) P. Beauv., hooked
bristlegrass
- Setaria viridis* (L.) P. Beauv., green foxtail,
green bristlegrass
- Sorghum halepense* (L.) Pers., Johnsongrass
- Taeniatherum caput-medusae* (L.) Nevski,
Medusa-head, medusahead
- Triticum aestivum* L., common wheat, Wheat
- Vulpia bromoides* (L.) S.F. Gray, brome fescue,
European foxtail fescue, Six-Weeks Fescue
- Vulpia myuros* (L.) C. Gmelin, Foxtail Fescue,
rattail fescue, rat-tail fescue
- Vulpia myuros* (L.) C. Gmelin var. *hirsuta*
Hackel, hairy rattail fescue, Zorro fescue,
foxtail fescue, Rat-tail Fescue, Fox-tail
Fescue
- Vulpia myuros* (L.) C. Gmelin var. *myuros*,
Fescue, rattail fescue, Six weeks fescue,
False foxtail fescue

POLYGONACEAE

- Polygonum hydropiper* L., marsh pepper,
marshpepper knotweed, Common
smartweed
- Polygonum patulum* M. Bieb., Bellard's
smartweed
- Polygonum persicaria* L., spotted ladysthumb,
lady's thumb

- Rumex acetosella* L., common sheep sorrel,
sheep sorrel
Rumex conglomeratus Murray, clustered dock,
green dock
Rumex crispus L., curly dock, Curly-leaved
Dock, Rhubarb

PORTULACACEAE

- Portulaca oleracea* L., little hogweed, Purslane,
common purslane

POTAMOGETONACEAE

- Potamogeton crispus* L., Cut-leaved pondweed,
curly pondweed, crispate-leaved pondweed

PRIMULACEAE

- Anagallis arvensis* L., pimpernel, scarlet
pimpernel

RANUNCULACEAE

- Consolida ambigua* (L.) Ball & Heywood,
Rocket larkspur, doubtful knight's spur
Ranunculus muricatus L., spiny buttercup,
Pricklefruit buttercup, spinyfruit buttercup,
Buttercup
Ranunculus repens L., creeping buttercup,
Crowfoot, Creeping Buttercup

RESEDACEAE

- Reseda luteola* L., dyer's mignonette, weld

ROSACEAE

- Prunus cerasifera* Ehrh., cherry plum
Rubus discolor Weihe & Nees, Himalaya-berry,
Himalaya-blackberry, *Himalayaberry*,
Himalayan blackberry, Blackberry
Sanguisorba minor Scop. subsp. *muricata* Briq.,
Burnet, small burnet, garden burnet

RUBIACEAE

- Galium divaricatum* Lam., Lamarck's bedstraw
Galium murale (L.) All., yellow wall bedstraw,
tiny bedstraw
Galium parisiense L., wall bedstraw
Galium spurium L., sticky-willy, Marin County
bedstraw
Sherardia arvensis L., blue fieldmadder, field
madder

SALICACEAE

- Populus alba* L., Silver poplar, white poplar

SCROPHULARIACEAE

- Antirrhinum majus* L., garden snapdragon,
common snapdragon
Bellardia trixago (L.) All., Mediterranean
linseed
Kickxia elatine (L.) Dumort., Sharp-leaved
fluellin, sharp-point fluellin, sharpleaf
cancerwort
Kickxia spuria (L.) Dumort., roundleaf
cancerwort, fluellin
Linaria genistifolia (L.) Mill. subsp. *dalmatica*
(L.) Maire & Petitm., Toadflax, Dalmatian
toad-flax
Linaria pinifolia (Poir.) Thell., pine-needle toad-
flax, pineneedle toadflax
Linaria vulgaris Mill., butter and eggs
Verbascum blattaria L., moth mullein
Verbascum thapsus L., common mullein, Woolly
Mullein
Veronica arvensis L., Speedwell, corn speedwell
Veronica persica Poir., birdeye speedwell, bird's-
eye speedwell

SIMAROUBACEAE

- Ailanthus altissima* (Mill.) Swingle, tree-of-
heaven, ailanthus

SOLANACEAE

- Datura stramonium* L., jimsonweed, Jimson
weed
Lycopersicon esculentum Mill., tomato
Nicotiana acuminata Hook. var. *multiflora*
(Philippi) Reiche, Tobacco, many-flowered
tobacco, manyflower tobacco
Nicotiana glauca Graham, tree tobacco
Petunia violacea Lindl., petunia
Solanum carolinense L., Carolina horse-nettle,
Carolina horsenettle
Solanum elaeagnifolium Cav., silver-leaved
horsenettle, silverleaf nightshade,
Silverleafnettle, horse-nettle
Solanum lanceolatum Cav., lance-leaf
nightshade, orangeberry nightshade
Solanum rostratum Dunal, Buffalobur,
buffalobur nightshade, buffalo berry
Solanum tuberosum, Potato

TAMARICACEAE

Tamarix gallica L., French tamarisk
Tamarix parviflora DC., smallflower tamarisk,
Fourstamen tamarisk, tamarisk

ULMACEAE

Ulmus minor Mill., smooth-leaved elm, English
elm, English elm

URTICACEAE

Urtica urens L., dwarf nettle, Annual Stinging
Nettle

VALERIANACEAE

Centranthus ruber (L.) DC., red valerian,
Jupiter's Beard, red-valerian

ZYGOPHYLLACEAE

Tribulus terrestris L., puncture-vine,
puncturevine