Southern California Coast and Mountains and Valleys (SCMV) Ecoregion Vegetation Sampling

Prepared for

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Vegetation Classification and Mapping Program
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March 2026

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Cover Photo: Looking east across an *Adenostoma sparsifolium* stand in the Santa Rosa Mountains of Riverside County, CA. September 26, 2024.

ABSTRACT

Althouse and Meade (A&M), contracted by the California Department of Fish and Wildlife's (CDFW) Vegetation Classification and Mapping Program (VegCAMP), collected vegetation data within the Southern California Coast and Mountains and Valleys (SCMV) survey area covering more than 6.4 million acres. The data from this project was collected in support of the Survey of California Vegetation (SCV) and will ultimately feed into the State's vegetation classification to develop a fine-scale vegetation map of the region in future projects. Using the CNPS-CDFW Protocol for Combined Vegetation Rapid Assessment and Relevé Sampling, A&M, California Native Plant Society (CNPS), and other partners coordinated with landowners and land managers, obtained land access permits, and collected 2,325 surveys including 1,835 rapid assessment surveys and 490 relevé plots. Field data were entered into a centralized vegetation survey database and underwent thorough quality control by our project team. A total of 1,725 vascular plant taxa were documented during these surveys including 142 rare taxa. Field surveys occurred across two field seasons between April 2024 and September 2025 and represent approximately 286 different vegetation alliances (102 considered sensitive by CDFW with a S1-S3 rank). Confidence of field alliance identifications are summarized, which may indicate where analysis of the collected data could help refine current Manual of California Vegetation (MCV) classifications. A total of 954 voucher specimens representing approximately 575 taxa documented during the project were submitted to the Jepson Herbarium in Berkeley, California. In addition, surveys documented significant range extensions for three taxa, including one taxon with unresolved taxonomy and another that may represent a new species. Through the scope and intensity of this effort, long-standing spatial and ecological data gaps were addressed, substantially expanding regional knowledge of vegetation patterns and improving the foundation for future classification, mapping, and management work.

ACKNOWLEDGEMENTS

This vegetation sampling effort represents the hard work of many people and organizations with special acknowledgements to funders, project advisors, field staff, data analysts, and those who granted or helped grant us land access. We apologize if we missed anyone who helped with this complex effort!

Funding:

Funding for this sampling effort was provided by the California Department of Fish and Wildlife through an A&M-led effort. Supplemental funding for a portion of the San Diego region sampling area was provided by the San Diego Association of Governments (SANDAG) in support of the San Diego Management and Monitoring Program (SDMMP) through an AECOM-led effort.

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Bureau of Land Management

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California Department of Parks and Recreation

California Native Plant Society

U.S. Forest Service

The Wildlands Conservancy

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City of Los Angeles

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Grace Tudor

Land Trust for Santa Barbara County

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Mountains Recreation and Conservation Authority

Ojai Valley Land Conservancy

Puente Hills Habitat Preservation Authority

San Bernardino County Regional Parks

San Diego County, Department of Parks and Recreation

The Nature Conservancy

The Wildlands Conservancy

United Water Conservation District

Ventura Land Trust

State

California Department of Fish and Wildlife

California State Coastal Conservancy

State Parks - Carpinteria State Beach, Chino Hills State Park, Cuyamaca Rancho State Park, El Capitan State Beach, Emma Wood State Beach, Gaviota State Park, Palomar

Mountain State Park, Placerita Canyon State Park, Refugio State Beach, San Buenaventura State Beach, Silverwood Lake State Recreation Area, Wildwood Canyon State Park

University of California Natural Reserves - Carpinteria Salt Marsh Reserve, Coal Oil Point Natural Reserve, and Sedgwick Reserve

Federal

Bureau of Land Management

US Forest Service - Angeles National Forest, Cleveland National Forest, Los Padres National Forest, and San Bernardino National Forest

Vandenberg Space Force Base

Other Collaborators (who provided assistance or input):

Pala Band of Mission Indians

Environmental Defense Center, Santa Barbara (Brian Trautwein)

Staci Marko and Sophie Winitsky at the Jepson Herbarium, UC Berkeley

1 INTRODUCTION

The Southern California Coast and Mountains and Valleys (SCMV) Vegetation Sampling Project (Project) addresses a uniquely large, complex, and fragmented landscape that presents challenges distinct from prior Vegetation Classification and Mapping Program (VegCAMP), Survey of California Vegetation (SCV) sampling efforts (Figure 1). Spanning more than 6.4 million acres across multiple counties and two ecoregion sections, the SCMV region encompasses a highly heterogeneous mosaic of coastal foothills, interior valleys, and montane systems interwoven with extensive urban, agricultural, military, and transportation land uses. Land ownership within the SCMV project area is exceptionally fragmented, requiring coordination across numerous public agencies, private landowners, and conservation organizations, resulting in uneven spatial access across the landscape. In addition, desert ecoregions and areas previously covered by SCV projects were explicitly excluded, creating a project area defined as much by its boundaries and omissions as by its ecological breadth. As a result, this effort is designed to strategically address long-standing spatial and ecological gaps in SCV sampling coverage, particularly in under-represented vegetation types and transition zones that occur within heavily developed or access-limited portions of southern California.

1.1 PURPOSE

The purpose of the SCMV project is to implement a coordinated, region-wide vegetation sampling effort that addresses identified spatial and ecological gaps in VegCAMP's existing vegetation survey dataset. The Project is designed to strategically collect new vegetation rapid assessment and relevé data across unsampled and underrepresented vegetation types in areas of the Southern California Coast (261B) and Southern California Mountains and Valleys (M262B) sections of California as defined by the USDA's Ecological Subregions of California (Miles and Goudey 1997;

Figure 2). For the purposes of this project, the combined area of these two ecoregion sections is referred to as the Southern California Mountains and Valleys ecoregions. These data will be used along with previously collected data from the region to further develop a hierarchical vegetation classification, adhering to Survey of California Vegetation (SCV; CDFW 2025) protocols and National Vegetation Classification System (NVCS; FGDC 2008) standards. Data generated through this effort will provide standardized, quality-controlled field observations representative of the region's ecological variability, supporting vegetation classification, mapping, and related resource management applications, as well as refinement of alliance and association classification units used in the Manual of California Vegetation (MCV; CNPS 2025).

1.2 SCOPE

Althouse and Meade (A&M) was contracted by the California Department of Fish and Wildlife (CDFW) to create and execute a strategic sampling plan to adequately collect vegetation data across the range and variability of vegetation in the SCMV project area (

Figure 2). The SCMV project area covers approximately 6.4 million acres within the Southern California Mountains and Valleys ecoregions, extending from northwest to southeast across much of Santa Barbara, Ventura, Los Angeles, Orange, western Riverside, and San Diego counties. Desert ecoregions and areas previously targeted by smaller, focused vegetation sampling projects were excluded from the SCMV project area. As part of project implementation, coordination with Tribal governments and representatives was conducted, as appropriate, to support access, communication, and consideration of Tribal priorities within the project area.

The SCMV region is of particular interest for vegetation inventory because it contains unsampled vegetation communities, under sampled regional variation within previously sampled vegetation types, and remnant areas of natural vegetation embedded within highly developed landscapes that may be at risk from land-use conversion and associated disturbances. Prior to the SCMV project, approximately 7,500 vegetation relevé and rapid assessment surveys were collected within the Southern California Mountains and Valleys ecoregions but only ~800 within the project area (

Figure 2). This prior data represents a combination of older and more recent surveys collected under varying objectives and calibration levels. Over 300 previously sampled stands in the project area were from a project mostly targeting stands characterized by *Pseudotsuga macrocarpa*. The sampling undertaken through the SCMV project is intended to fill remaining spatial and ecological data gaps by targeting vegetation types and geographic areas that were missed or underrepresented during earlier sampling efforts.

1.3 PROJECT COORDINATION

Althouse and Meade, Inc., along with subcontracted partners at California Native Plant Society (CNPS), Tukman Geospatial LLC, Pax Environmental, Wildscape Restoration, and Coburn Biological, provided logistical and botanical expertise to collect and enter field data focused upon natural and semi-natural stands of vegetation in the SCMV project area. CNPS was a major contributor to the project collecting over 35% of the surveys and herbarium specimens as well as providing the digital data collection and quality control (QC) platforms used. A&M and CNPS met regularly with CDFW to discuss project progress and address any questions as they came up. Likewise, A&M coordinated with other project entities through regular weekly and monthly meetings over the course of the Project.

As part of a separate, concurrent contract, AECOM (Architecture, Engineering, Construction, Operations, and Management) collected 43 surveys within the project area using the CNPS data collection platform. These surveys are included in this report. AECOM's work was performed under a contract funded by the San Diego Association of Governments (SANDAG), which supports the San Diego Management and Monitoring Program (SDMMP). The consultant's data collection scope was managed and led by SDMMP. Coburn Biological served as a subcontractor to AECOM through Mulligan Biological Consulting and was responsible for all AECOM-related field planning, data collection, specimen collection and ID, and final survey data QC. Coburn Biological also worked as a subcontractor for A&M collecting additional data for this project and helping coordinate between A&M and AECOM.

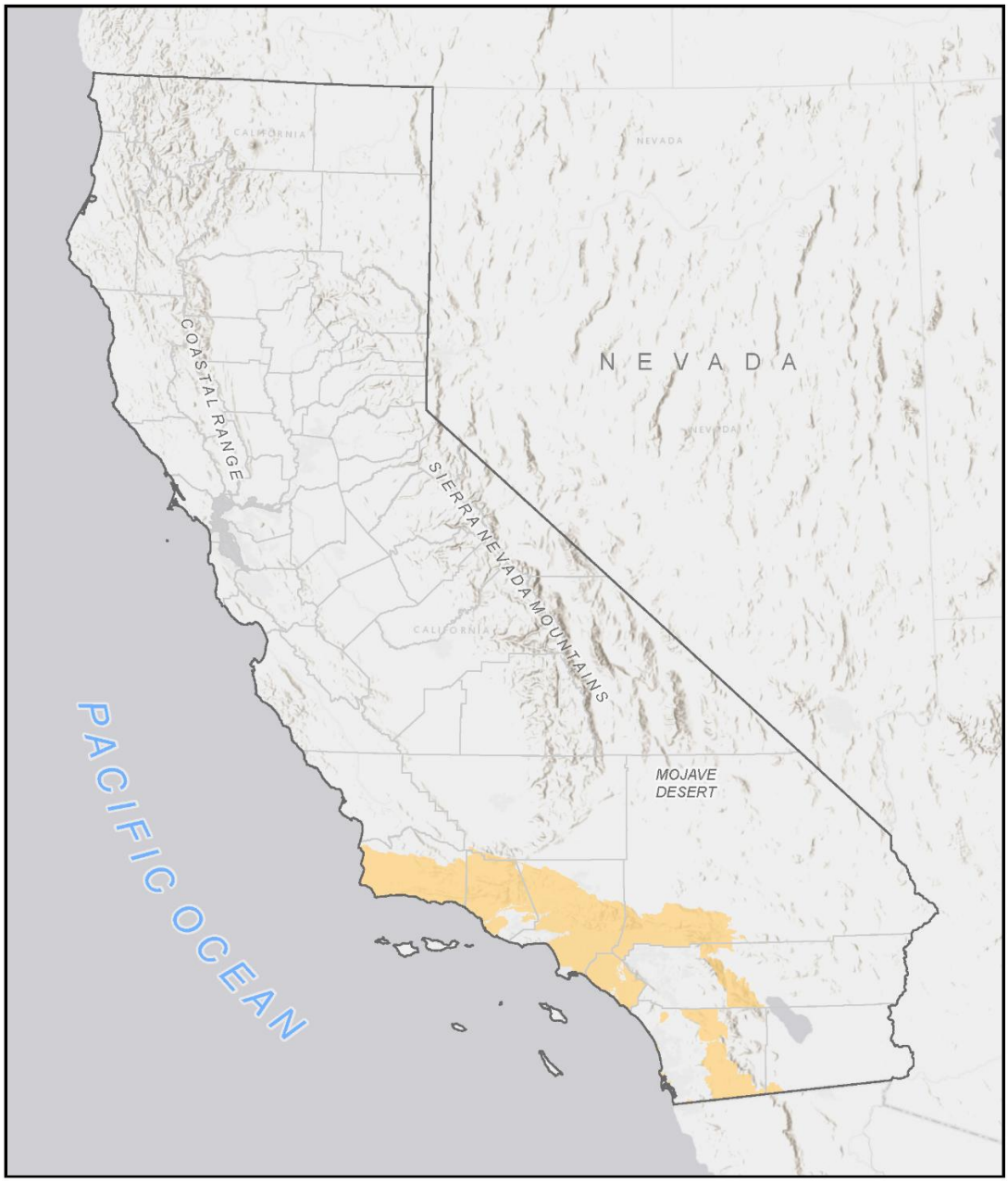
As part of project coordination, our team engaged with the Pala Band of Mission Indians (PBMI) to discuss the SCMV Vegetation Sampling Project and related field activities. Jonathan Snapp-Cook (CNPS) and Kristen Andersen (A&M) met with PBMI's Environmental Planner Kurt Broz, to provide an overview of the project scope, objectives, and planned sampling approach. In addition, Jonathan Snapp-Cook facilitated two meetings with CNPS staff on PBMI tribal lands between September and December 2025 to support communication and coordination related to the project.

Kristen Andersen (A&M) has made contact with the Environmental Representative from the Santa Ynez Band of Chumash Indians (SYBCI) regarding the statewide sampling effort, including vegetation sampling activities near the Santa Ynez River mouth. Ongoing coordination with the Tribe will continue beyond the SCMV project deadline, as

A&M anticipates continued work in this area and remains committed to building trust and maintaining a collaborative relationship with the SYBCI.

Continued engagement with Tribal governments is recommended for future VegCAMP projects. Ongoing coordination led by CDFW would help continue the relationship and consideration of Tribal interests in vegetation sampling and related efforts.

FIGURE 1. SOUTHERN CALIFORNIA MOUNTAINS AND VALLEYS (SCMV) SURVEY AREA OVERVIEW



Legend

SCMV Project Area

N

0 50 100 Miles

Southern California Coast and Mountains and Valleys Ecoregions Vegetation Sampling
Map Center: 37.32105°N 119.04312°W
California, United States of America

Basemap Source:
Esri Light Gray and Esri World Hillshade

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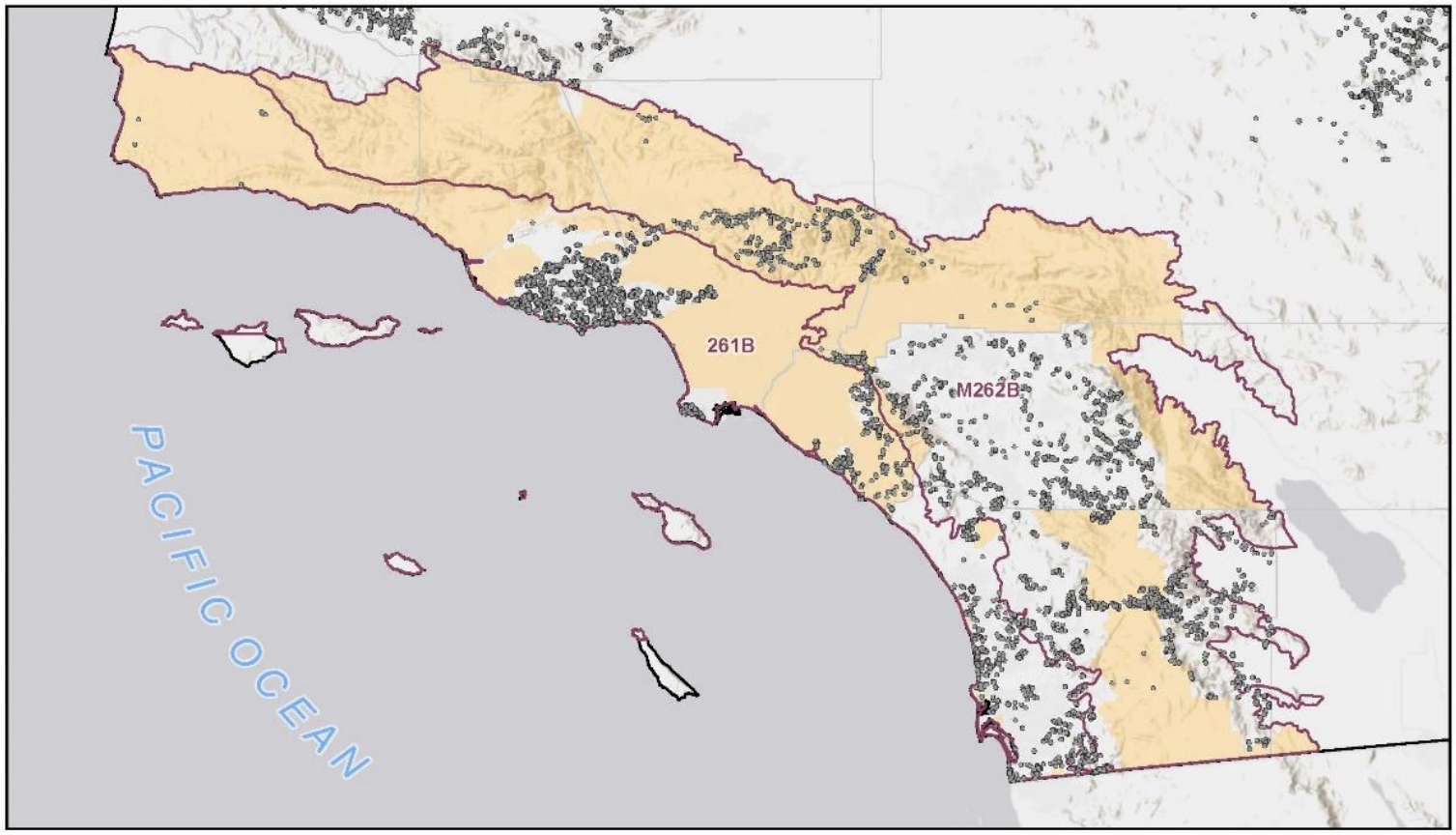
February 27, 2026 04:10 PM by SS

FIGURE 2. EXISTING DATA WITHIN AND ADJACENT TO SCMV SURVEY AREA



Legend

SCMV Project Area | USDA Ecoregion Section | Pre-2024 RA/Relevé Surveys

N

0 25 50 Miles

Southern California Coast and Mountains and Valleys Ecoregions Vegetation Sampling
Map Center: 33.7277°N 118.23124°W
California, United States of America

Basemap Source:
Esri Light Gray and Esri World Hillshade

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March 16, 2026 08:48 AM by SS

2 METHODS

Field sampling and data management methods used for the SCMV project are documented below. Together, these methods were designed to support consistent application of the CNPS–CDFW vegetation classification and survey protocols to produce a defensible dataset suitable for vegetation classification and mapping following the state and national standards.

2.1 FIELD SAMPLING

2.1.1 Mission Planning

Project coordination included use of existing GIS data provided by CNPS and CDFW, which were displayed through an online viewer (ArcGIS Online) and planning map platform established by Mark Tukman of Tukman Geospatial LLC. This platform served as the primary tool for land access planning and, in conjunction with ArcGIS Field Maps, supported geospatial data collection and tracking by field crews.

This viewer showed a variety of layers including both current and existing survey points, the sample allocation, land ownership and parcels, roads and trails, points of interest, and the project boundary. Permit status of parcels was updated and shown in different colors to make it easy to see which parcels we were permitted to sample or not. Before surveys, additional sample allocation points of interest were often added based on unique signatures observed in aerial imagery. Likewise, camping, parking, meeting locations, and areas with access issues could be added to the map both prior to a sampling hitch and updated in the field as needed.

2.1.2 Sample Allocation

Prior to field sampling, a stratified random survey design was used by CDFW to generate a target sample point allocation using ArcGIS Pro to guide vegetation survey locations to be sampled for this project. The allocation approach attempted to balance three goals: 1) generate a target number of samples based on predicted available capacity for staff conducting the field surveys (time and budget); 2) distribute samples among the coarse vegetation types so that both rare and common types were represented; and, 3) facilitate access to sites based on land ownership and proximity to roads or trails. This approach, in combination with manual photo-interpreted sample allocation, and subjective identification of stands across a landscape through reconnaissance, maximized efficiencies that enabled more samples to be collected while also increasing the diversity of vegetation types sampled. The target sample points were used to direct exploration at the point and surrounding area for homogeneous vegetation stands to sample, rather than act as a fixed sampling location. More than one vegetation type could be sampled in the area surrounding the target sample point if the sampling locations were greater than 500 m apart (ideally at least 1 km apart) to control for autocorrelation, or if the vegetation

stands had no or only very low cover of taxa in common. In addition, field crews carried a list of MCV vegetation alliances and associations that potentially occur within the study area, with target survey counts for each, and kept a running tally of the number of samples actually collected for each vegetation type. This ensured that samples were distributed proportionally across all known types and that as many types as could be discovered were sampled.

The stratified random survey design used the CALVEG (Classification and Assessment with Landsat of Visible Ecological Groupings) South Coast vegetation dataset (USFS 2010) and the National Wetlands Inventory (NWI, USFWS 2019) dataset to stratify the allocation of sample target points. These two datasets were combined using an identity procedure and then divided further by areas that were below or above 1500 m elevation. Then the region was divided by fire perimeters (CalFire 2022) for years 2018-22 and Wildland Fire Interagency Geospatial Services (WFIGS) 2023, with areas of high soil burn severity as determined by Burned Area Emergency Response (BAER, USGS 2021) data excluded. The allocation was bounded to areas within 750 m of roads that occurred within parcels found in the 2022 California Protected Areas Database (CPAD, GreenInfo Network 2022). Stratification was based on unique cover type combinations between CalVeg, NWI, elevation, and fire layers across the study area. The Create Random Points function was used to generate an excess of points, and then a stratification of the unique types was performed based on the point counts and script run to randomly select target points according to the stratification and desired total. In the Jack and Laura Dangermond Preserve (TNC), a fine scale vegetation map already existed prior to this project and allocation and was stratified directly using similar random points procedures as above. The final stratified random allocation contained 1960 points. Additionally, imagery was used by ecologists to identify unique signatures as potential targets for sampling, and 882 visual targets were also used to direct samples. A total of 2,842 locations were allocated by CDFW with a target of collecting 2200 vegetation surveys. Allocations for the Jack and Laura Dangermond Preserve and Sedgewick Reserve in Santa Barbara County were sampled for a concurrent project and not part of the sampling for the SCMV project.

A&M and subcontractors primarily found the CDFW sampling allocation points useful in visualizing accessible areas where surveys should or could be targeted. Many allocation points were found to be difficult to access or were not good representatives of the vegetation patterns observed in the field. Most sampling sites were chosen after exploring an area in the field and/or exploring the aerial imagery for representative patterns/stands in an area. Some rarer habitats including vernal pools, wet meadows, and scree forblands were successfully found and sampled as a result of exploring aerial imagery before a site visit or looking at patterns in the aerial imagery while in the field.

2.1.3 Land Access

Beginning in the early spring of 2024, the project team contacted landowners and land managers of both public and private lands to obtain access to these lands for surveys.

Access efforts focused on permits that would maximize land access, locations with diverse vegetation patterns, and areas with unsampled or underrepresented vegetation types. Written permission was obtained to access all lands, public and private. Local CNPS chapters assisted by providing site recommendations and sharing local knowledge that supported both site selection and access planning.

Permissions were obtained through several mechanisms depending on landowner preferences and agency requirements. Some permits were secured and provided directly by CDFW, while in other cases custom permission letters were sent to landholders for signature and return. Other landowners required completion of their own official access request forms, and some granted access informally via email correspondence. The time required to obtain permits varied widely, ranging from a few days to several months and often requiring sustained follow-up.

The greatest challenge in obtaining permits was identifying the appropriate point of contact, which was often unclear or not readily available through landowner websites or parcel data. Locating the correct contact could take months; however, once contact was established, the permitting process was typically relatively quick. In three targeted cases where contact was made but permits were not obtained, one land manager did not allow contractor access, another repeatedly delayed review until it was no longer feasible for the project timeline, and a third expressed initial interest but ultimately did not respond to follow-up communications.

2.1.4 Data Collection

In late April and early May 2024, field staff received a three-day training on the CNPS-CDFW Protocol for Combined Vegetation Rapid Assessment and Relevé Sampling (Appendix A) provided by CDFW vegetation ecologists. In March 2025, field staff attended a four-day refresher training and recalibration for ocular cover estimation and to provide clarification to any outstanding questions.

Field sampling took place during two field seasons, April to October 2024 and February to September 2025. The sampling goal was to collect at least 2200 surveys representing all vegetation community types in the study area including 1700 shrublands and woodlands (or roughly 77%) following the rapid assessment protocol and 500 herbaceous stands (or roughly 23%) following the relevé protocol. Field staff worked independently and in teams, with regular meetings and rotation of work partners to ensure consistent application of survey protocols and recalibration of ocular cover estimation among observers.

Plants were primarily identified using the Jepson eFlora (Jepson Flora Project 2025) with additional use of regional floras, especially *A Flora of Southern California* (Munz 1974) and *Field Guide to the Flora of the San Gabriel Mountains* (Mistretta 2020).

2.1.5 Voucher Specimens

Staff compiled and organized plant specimens collected during surveys at survey locations. Some specimens were collected to confirm identifications and others were collected to improve the representation of specimens from the project area housed in California Herbaria. The project had a goal to collect a minimum of 800 specimens representing at least 800 distinct taxa for submission to the Jepson Herbarium at the University of California, Berkeley. Specimens with at least 1% cover were prioritized for identification. Identification information and collection status were updated on the datasheets and in the vegetation survey database if changed after assessing specimens.

2.2 DATA MANAGEMENT

2.2.1 Data Entry

A subset of the data collected for each relevé/rapid assessment was done so digitally, using the ArcGIS Survey123 (S123) phone or tablet app and uploaded into an ArcGIS Online database. The digitally collected data included the Location/Environmental Description, Habitat Description, Interpretation of the Stand, Strata covers and heights, as well as site photos (Page 1 of the Relevé and Rapid Assessment Field Form, Appendix A). The plant list and related percent cover data were recorded on a paper form (Page 2 of the Relevé and Rapid Assessment Field Form, Appendix A) and later manually entered into the S123 database. Paper datasheets were first photographed to create a backup record and then scanned and archived as PDFs. Changes to forms from quality control checks were noted on the forms with field values crossed out. Appendix B provides a list of surveyors and surveyor initials used on survey forms and occasional comments in the database.

Additional “Vegetation Observation” and “Return Recon” points were collected with the ArcGIS Field Maps app. The “Vegetation Observation” points were sometimes used as a substitute for or a supplement to the adjacent alliances field in the S123 app form and as a way of noting observed alliances that were not adjacent to a sampled vegetation stand. “Return Recon” points were collected for stands that surveyors considered for potential revisits, though many were not subsequently resampled. These points often offered similar information to the “Vegetation Observation” points.

2.2.2 Plant Taxonomy

Plant taxonomy for the data collected follows the Jepson eFlora (Jepson Flora Project 2025). Alignment with this standard was complicated by the plant names used in the Survey123 database, which were carried over from earlier projects using the same protocol. This list relied heavily on USDA PLANTS Database taxonomy (NRCS, 2025), which was missing hundreds of California plant names recognized by the Jepson eFlora and includes illegitimate homonyms. For example, the CDFW-provided list included both *Yucca brevifolia* Engelm. and the illegitimate *Yucca brevifolia* Schott ex Torr. (a synonym of *Yucca baccata* var. *brevifolia* L.D.Benson & Darrow), which could lead to data

entry/analysis errors if overlooked. Illegitimate homonyms that caused problems during this project have been removed from the master list, but others may remain.

Well over 100 plant taxa encountered during surveys were missing from the CDFW-provided list, though some missing taxa were added between the two field seasons and the remaining were added at the end of the second field season. For plant list data entry, Jepson eFlora taxa that were not included in the CDFW-provided list were entered as synonyms already on the CDFW-provided list or as the next higher taxon when there were no synonyms in the list. These taxa were also flagged in the plant list entries in the database in the note section of each entry saying “not in list” followed by the taxon that should be entered. All missing names of plant taxa encountered on this project were added to the final taxon list and updated in the data before submittal.

One complicated set of Jepson name changes happened halfway through the project. Four *Solanum* species were combined into *Solanum umbelliferum* Eschsch. but then divided into ten varieties of this species. As these were not straight one to one name changes, all identifications to *Solanum xanti* A. Gray were left with that name though all or most likely would fit under the current name *Solanum umbelliferum* var. *xanti* (A. Gray) D.J. Keil.

One taxon not yet in the Jepson eFlora, *Pinus californiarum* D.K. Bailey, was included in our plant list as the eFlora intends to recognize it soon and as it forms stands that could possibly be classified as an alliance or association. This is discussed further in the “Possible Novel Alliances and Associations” section of the Results (Section 0).

2.2.3 Data Quality Control (QC)

All data went through multiple rounds of QC. Field staff conducted a preliminary quality check of their data within 30 days of each survey. All data were then checked a second time during full survey QC, generally by a second person to ensure the surveyor had communicated clearly and had not overlooked anything. Data collected during the first two weeks of each field season was submitted to CDFW for review and QC to ensure the protocol was being implemented correctly.

CNPS provided a QC protocol with a QC dashboard (through ArcGIS Experience Builder) that streamlined data QC, including digital forms embedded within the dashboard and tables within and separate from the dashboard. Various table-based and script-based queries were used to detect errors and issues that may have been overlooked during survey-focused QC steps. This included sorting fields within the dashboard and database to check for outlier and missing values in the data and queries to detect erroneous values. Survey locations were thoroughly reviewed for accuracy and to ensure they fell within the boundaries of lands we had permission to access.

All identifications of stand alliances made in the field (field alliances) were later reviewed relative to MCV membership rules. The term “field alliance” refers to the identification made on an alliance before any formal analyses have been done to classify the data as such analyses may reveal the need for revisions to MCV alliance membership rules and

possible novel alliances. Even if an alliance identification was later revised during quality control, the original identification recorded in the field is referred to as the “field alliance,” or simply “alliance.”

Two possible data quality issues stand out that should be noted. First, taxa with ambiguous strata were sometimes assigned to different strata by different people in the field. Second, some surveyors were confused about how to address percent cover overlap between strata and taxa during some surveys, especially surveys conducted at the start of the effort. Each quality issue is further addressed below.

Many taxa of plants do not fit clearly into one of the three strata: herb, shrub, or tree. Subshrubs and taxa that straddle the line between shrubs and trees are particularly problematic. Some taxa like *Eriophyllum confertiflorum* (DC.) A. Gray may be shrubby in some regions and be an herb that only lives two to three years in other regions. Others like *Salix lasiolepis* Benth. and *Fraxinus dipetala* Hook. & Arn. are classified as “shrub to small tree” in the Jepson eFlora. One species, *Quercus chrysolepis* Liebm., is included as a shrub in one MCV alliance and as a tree in another alliance, but some stands have both shrub-like and tree-like forms. For this project, CDFW required each species to be assigned only one strata across all surveys. We were provided with a table of previous determinations on which strata to use for each taxon, but this was incomplete and not always consulted when a surveyor thought it was clear which strata a particular taxon belonged to. Some new strata decisions were added over the course of field surveys and some later decisions contradicted the original table that was provided. All of these issues inevitably led to strata corrections during the QC process, which could affect overlap values within and between strata, though likely to a limited degree in all or most cases. As of this report, CDFW is working on including a stratum decision for all taxa in their plant list, which should alleviate this issue in the future.

A second potential data issue occurred where some surveyors were confused about how to record percent cover overlap between strata and taxa during some surveys, particularly from the first season of sampling. This issue was identified through review of overlap calculations on specific data forms that were inconsistent with protocol guidance. Some overlap revisions made during first-year QC were also inconsistent. Surveyors associated with these records were asked to review the revisions and, where necessary, adjust overlap estimates to the best of their ability. Because these adjustments were made after fieldwork, they may result in minor differences from values that would have been recorded if overlap had been assessed correctly in the field. To reduce confusion during the second field season, clearer instructions on overlap estimation were provided to surveyors. These clarifications could be incorporated into or appended to future versions of the protocol.

3 RESULTS

The results of the SCMV vegetation sampling effort are presented below. This section summarizes the vegetation alliances sampled, floristic diversity documented, potentially novel vegetation types, and community engagement activities. Because field alliance and association assignments are preliminary and based on current MCV concepts, these results are intended to inform future analyses and classification updates rather than represent finalized vegetation units.

3.1 VEGETATION SAMPLING

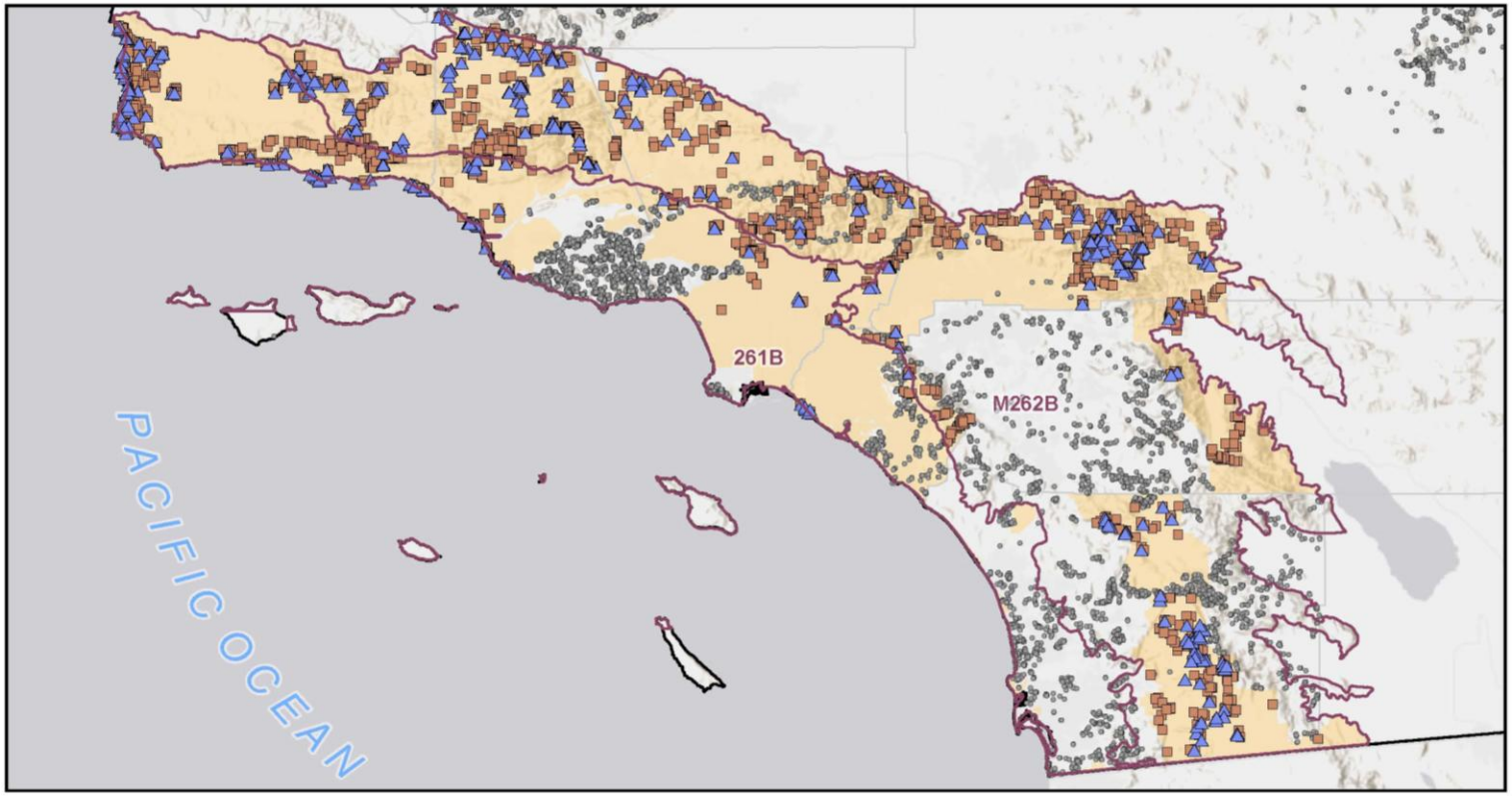
3.1.1 Sample Collection

A&M, CDFW, CNPS, Pax Environmental, Coburn Biological, AECOM, and Wildscape Restoration coordinated with a variety of land managers and landowners including U.S. Forest Service, Bureau of Land Management, California State Parks, county agencies, land conservancies, and private landowners regarding land access permission. We regularly used a shared spreadsheet to document names/entities and notes regarding land access per property, and we often updated the ArcGIS Online Viewer to display permissions for areas/properties where we had scheduled field surveys. Permits will be archived in PDF form on the CDFW VegCAMP server and are noted for each stand in the geodatabase. Additionally, some of the landowners either requested or required summaries for what was sampled on their lands, for which individualized reports were developed and shared.

Surveyors conducted 1,835 vegetation rapid assessment and 490 relevé surveys across both field seasons in the SCMV project area for a total of 2,325 surveys (Figure 3). Of these, 586 were tree alliances, 1,183 were shrub alliances, and 556 were herb alliances. Tree and shrub alliances were sampled using the rapid assessment method. Herbaceous alliances were primarily sampled using the relevé method, but some were sampled using the rapid assessment method due to safety, accessibility, or when a relevé did not adequately capture the vegetation cover and diversity of the stand.

The relevé size of 100 m^2 was found to be inadequate in some areas of sparse vegetation such as scree fields where relevés would often overrepresent, underrepresent, or exclude characteristic taxa within the stand. In these cases, sampling full stands or larger areas within stands better showed the broader vegetation patterns of the stand than 100 m^2 plots would.

FIGURE 3. SCMV PROJECT VEGETATION SURVEY DATA RESULTS



During the two field seasons, 286 vegetation alliances were surveyed including 48 tree types (Appendix C, Table C-1), 114 shrub types (Appendix C, Table C-2), and 124 herbaceous types (Appendix C, Table C-3). Of these, 132 stands may represent up to 54 vegetation types (alliances or associations) not currently included in the MCV. Of the alliances sampled that are currently in the MCV, 102 are considered sensitive by CDFW with a rank of S1-S3 (CDFW 2026). Sensitive alliances sampled include 24 tree types (Appendix C, Table C-1), 39 shrub types (Appendix C, Table C-2), and 39 herbaceous types (Appendix C, Table C-3).

An additional 856 “vegetation observation” points and 373 “return recon” points were collected to provide supplemental data on vegetation stands not sampled. These “vegetation observation” and “return recon” points are included in the project geodatabase submitted to CDFW.

Between 1 and 57 stands were sampled for each field alliance (the preliminary alliance identification before analyses). Broken into sample size groups, 69 alliances only had a single stand surveyed, 105 alliances had 2 to 5 stands surveyed, 41 alliances had 6 to 10 stands surveyed, 39 alliances had 11 to 20 stands surveyed, and 32 alliances had 20+ stands surveyed. These are broken down by herb, shrub, and tree alliances in Figure 4. Number of stands sampled per alliance varied considerably due to many factors including how common stands of an alliance are, how variable an alliance is, and which alliances CDFW or CNPS wanted prioritized. It is particularly notable in Figure 4 that herb alliances appear to have smaller sample sizes than the shrub and tree alliances, however, many of these are surveys are for stands that do not fit well in the current MCV classification. These values may shift if subsequent analyses indicate that some poorly sampled alliances should be combined into broader alliance groupings. The SCMV project also did not cover the full SCMV region as some areas had already been sampled. Combining this dataset with those from previous projects in the region may also show the sampling to be more even than the summary of this project’s data.

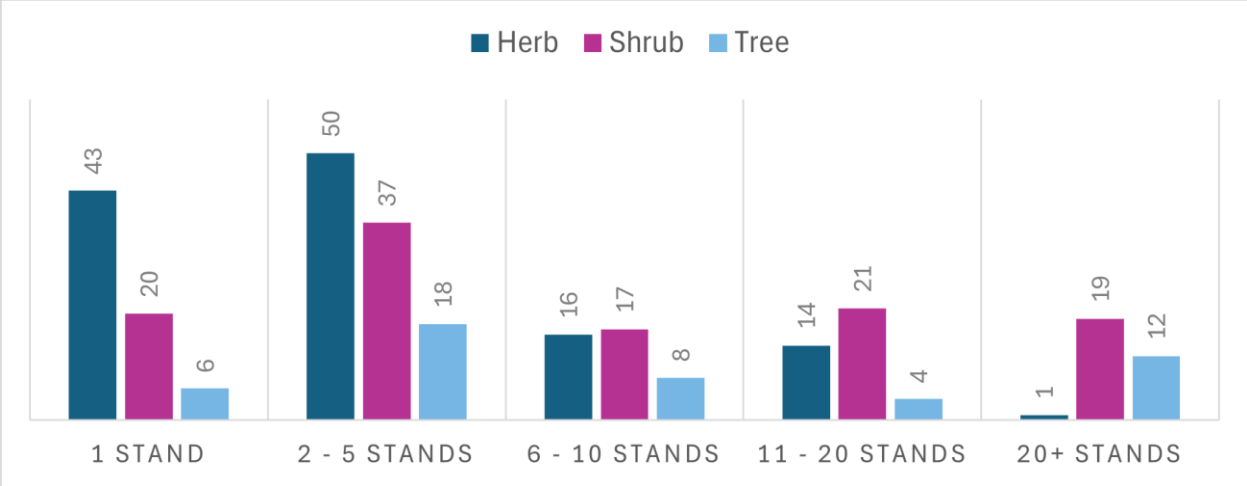


FIGURE 4. NUMBER OF STANDS SAMPLED PER ALLIANCE

COLUMNS NOTE THE NUMBER OF HERB, SHRUB, AND TREE ALLIANCES SAMPLED WITHIN EACH OF FIVE CATEGORIES DENOTING THE NUMBER OF STANDS SAMPLED IN THOSE ALLIANCES. FOR EXAMPLE, 18 TREE ALLIANCES HAD BETWEEN 2 AND 5 STANDS SAMPLED WITHIN THEM.

Tables A1 through A3 in Appendix C include how confident the assessor was in their choice of a field alliance for each stand. A high confidence indicates that the field alliance decision for an assessed stand fit the MCV characteristic species and membership rules well for that alliance (Figure 5). Confidence values of medium or low indicate a variety of possible problems when deciding on a field alliance for a stand. In many of these cases, the MCV membership rules were not quite accurate for a stand, or a stand fit the membership rules of multiple alliances. Many novel alliances and associations, as well as regional expressions of some already defined by the MCV, may have been sampled during the SCMV project as well. So, the current MCV membership rules may not be reliable for assessing some stands in this region until this data can be integrated into a newer version of the MCV. Some vegetation stands transition gradually from one alliance to another or form complex mosaic patterns that make boundaries difficult to delineate, which may have complicated keying to a current MCV vegetation type. The data from this project will help to clarify vegetation type concepts in order to better accommodate these currently ambiguous settings.

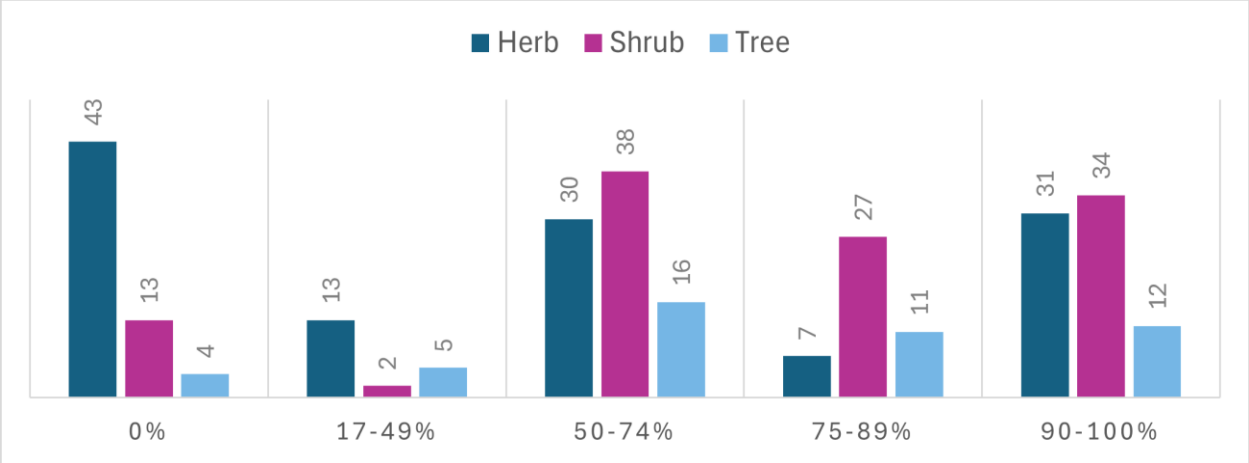


FIGURE 5. PERCENT OF HIGH CONFIDENCE STANDS IN EACH ALLIANCE

COLUMNS NOTE THE NUMBER OF HERB, SHRUB, AND TREE ALLIANCES SAMPLED WITHIN EACH OF FIVE CATEGORIES DENOTING THE PERCENT OF STANDS SAMPLED IN THOSE ALLIANCES THAT HAD A HIGH CONFIDENCE THAT THE FIELD ALLIANCE CHOSEN FOR THE STAND WAS CORRECT. FOR EXAMPLE, 38 SHRUB ALLIANCES HAD BETWEEN 50 AND 74% OF STANDS SAMPLED WITHIN THEM WITH A HIGH ALLIANCE CONFIDENCE.

3.1.2 Possible Novel Alliances or Associations

Over 130 stands that did not fit well with descriptions and membership rules of vegetation alliances in the current MCV were given a broad field alliance classification of "Other" plus a best guess on what the alliance could possibly be. Notes on some of the more common, better sampled, and/or distinct of these possible alliances or associations follow below.

3.1.2.1 *Carex (schottii, senta)* meadows (n=10)

Stands in wet meadows settings dominated by *Carex schottii* Dewey and/or *Carex senta* Boott may constitute a new alliance or association (Photo 1). Stands characterized by *Carex schottii* are not represented in the MCV. *Carex senta* is only mentioned as an associate in the *Carex nudata* Herbaceous Alliance, which is along streams rather than wet meadows. Stands of *Carex schottii* and/or *Carex senta* are common in the San Bernardino Mountains, the San Jacinto Mountains, and possibly in mountains in San Diego County.

It was found during surveys that *Carex schottii* and *Carex senta* need taxonomic work. One key character for distinguishing these two species is whether they are cespitose or not, cespitose meaning that the rhizomes are so short that the plants form dense clumps. Observations of stands of what may be *Carex schottii*, *Carex senta*, and/or hybrids found that the length of rhizomes and size of plants mostly appears to be related to soil moisture. The wettest areas often have plants with the shortest rhizomes and rhizome length increases as soil moisture decreases, even within a single stand. The wettest areas also often have the largest plants. Additional identification characters such as inflorescence bract length, spike length, and leaf width do not clearly correlate with each

other or length of rhizomes. This suggests that *Carex schottii* and *Carex senta* may hybridize, are one variable species, are two confusing species that do not completely align with current treatments, or additional cryptic taxa are involved. A field-based morphological study coupled with a population genetics study is likely needed to resolve questions about these species as herbarium specimens do not clearly show differences between them.

Photo 1. *Carex schottii* meadow in the San Bernardino Mountains (SCMV3055, 8/7/2024).

3.1.2.2 *Ceanothus palmeri* shrublands (n=6)

Large areas of post-burn chaparral were dominated by *Ceanothus palmeri* Trel. (Photo 2), which is not currently included in the MCV. These could arguably be included as an association of the *Ceanothus* (*oliganthus*, *tomentosus*) Shrubland Alliance but do not currently fit the characteristic species or membership rules of this alliance.

Photo 2. *Ceanothus palmeri* stand in the San Rafael Mountains of Santa Barbara County (SCMV1314, 9/6/2025).

3.1.2.3 *Croton californicus* sandy forblands (n=6)

The MCV has alliances for sandy/dune forblands in the desert and coastal areas, however, there appears to be a lack of representation for similar inland habitats not in the desert. Stands sampled in this habitat often had a relatively high cover of *Croton californicus* Müll. Arg. and may constitute a new alliance or association (Photo 3). Similar stands have been observed in Alameda County in sandy/dune settings. In Santa Barbara County, this vegetation type is threatened by the invasive species *Ehrharta calycina* Sm.

Photo 3. *Croton californicus* sandy forbland in western Santa Barbara County (SCMV0318, 7/16/2024). Grey-green herbs are *C. californicus,* and reddish herbs are *Mucronea californica*.

3.1.2.4 *Eriogonum kennedyi* dwarf shrublands (n=11)

The pebble plains of the San Bernardino Mountains form stands dominated or codominated by *Eriogonum kennedyi* S. Watson (Photo 4). *Eriogonum kennedyi* appears to be the clear dominating indicator species in these stand; sometimes codominating with what is called *Artemisia nova* A. Nelson in the San Bernardino Mountains (see Appendix F for more on *Artemisia nova* in this region). It is interesting to note that the *Eriogonum kennedyi* and *Artemisia nova* in these stands are immediately replaced with the similar *Eriogonum wrightii* var. *subscaposum* S. Watson and *Artemisia tridentata* Nutt. just outside the stands, though the adjacent alliances with these species are generally not similar as a whole. All *Eriogonum kennedyi* from the San Bernardino Mountains stands are likely *Eriogonum kennedyi* var. *austromontanum* Munz & I.M. Johnst. despite some keying to var. *kennedyi* (taxonomic work is in progress at California Botanic Garden). Other common taxa in the pebble plains of the San Bernardino Mountains include *Allium parryi* S. Watson, *Boechera parishii* (S. Watson) Al-Shehbaz, *Castilleja cinerea* A. Gray, *Cusickiella douglasii* (A. Gray) Rollins, *Eremogone ursina* (B.L. Rob.) Ikonn., *Ivesia argyrocoma* (Rydb.) Rydb. var. *argyrocoma*, *Lewisia rediviva* Pursh, *Poa secunda* J. Presl subsp. *secunda*, and *Viola douglasii* Steud. These pebble plains *Eriogonum kennedyi* stands could arguably be placed as an association of the *Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis* Shrubland Alliance or *Eriogonum* spp. / *Poa secunda* Dwarf Shrubland Alliance; and perhaps there could also be a new association in the *Artemisia nova* Shrubland Alliance.

Other varieties of *Eriogonum kennedyi* may form their own alliances or associations, some possibly codominating with *Eriogonum wrightii* var. *subscaposum*, though some high elevation areas where they purportedly co-occur may have taxonomic issues. *Eriogonum kennedyi* var. *kennedyi* in Ventura County isn't tied to a single vegetation alliance and does sometimes co-occur with *Eriogonum wrightii* var. *subscaposum*. Interestingly, similar to some stands in the San Bernardino Mountains, *Eriogonum kennedyi* var. *kennedyi* in Ventura County is sometimes codominant with what may be *Artemisia nova* in that region (see Appendix F).

Photo 4. *Eriogonum kennedyi* dwarf shrubland in the San Bernardino Mountains showing typical pebble plain habitat when *Artemisia nova* is absent (SCMV0834, 6/5/2024).

3.1.2.5 *Ehrharta calycina* grasslands (n=8)

In western Santa Barbara County, many sandy areas that were once dominated by native shrubs and/or herbs are now dominated by the invasive grass *Ehrharta calycina*. (Photo 5). The survey data from this project will add to the understanding of the new *Ehrharta calycina* Provisional Semi-Natural Alliance in the MCV. The prevalence and dominance of this invasive species in sandy habitats is further evidence that this type should be recognized.

Photo 5. *Ehrharta calycina* grassland in western Santa Barbara County (SCMV0524, 6/26/2024).

3.1.2.6 *Epilobium campestre* vernal pools (n=4)

Multiple vernal pools sampled were dominant or codominant with *Epilobium campestre* (Jeps.) Hoch & W.L. Wagner (Photo 6) but the MCV currently does not include *Epilobium campestre* as a characteristic species of any alliance. Sampling of vernal pools was limited in this project so it is difficult to hypothesize whether these vernal pools should be included in an *Epilobium campestre* alliance or as an association of an existing vernal pool alliance. Other vernal pools in the region are also expected to have variation not currently captured in the MCV.

Photo 6. An *Epilobium campestre* dominated vernal pool in the San Emigdio Mountains of northern Ventura County (SCMV2015, 5/31/2024).

3.1.2.7 *Fraxinus dipetala* shrublands (n=8)

Fraxinus dipetala Hook. & Arn. is often dominant or codominant in stands of north-facing mixed chaparral and is not currently an alliance in the MCV. It is, however, associated with several alliances as a characteristic species and is recognized in several associations across many chaparral alliances including the *Prunus ilciifolia – Heteromeles arbutifolia – Ceanothus spinosus* Alliance. We tried to sample representative stands that were dominant or codominant with *Fraxinus dipetala* to help clarify how to classify these stands (Photo 7). A preliminary look at the data suggests it may not be straightforward as associated species vary widely between stands. Additional sampling may be needed to resolve patterns in stands with *Fraxinus dipetala*.

Photo 7. Stand dominated by *Fraxinus dipetala* with significant *Ceanothus crassifolius* Torr. and *Quercus durata* var. *gabrielensis,* which is typical of many inaccessible stands in the San Gabriel Mountains seen with binoculars (SCMV0808, 5/9/2024).

3.1.2.8 *Pinus californiarum* woodlands (N=2)

Pinus californiarum D.K. Bailey is a species currently included within *Pinus monophylla* Torr. & Frém. in the Jepson eFlora, but the eFlora plans to recognize *P. californicum* in a future revision. These two species have a possible zone of overlap and intergradation in the eastern San Bernardino Mountains and eastward into Joshua Tree National Park, but *P. californicum* tends to occur in areas of more extreme May and June drought relative to the somewhat wetter areas *P. monophylla* occurs (Cole et. al. 2007). Populations of single-leaf pinyon pines called *Pinus monophylla* from the San Jacinto Mountains and southward may all be *Pinus californiarum* (Photo 8). Stands of *Pinus californiarum* could possibly be considered their own alliance or an association of the *Pinus monophylla* - (*Juniperus osteosperma*) Woodland Alliance. Differences in climate where each pine species occurs may lead to different characteristic species associated with stands of each. Further sampling of *Pinus californiarum* stands is likely needed to confirm. Previously sampled stands of *Pinus californiarum* may have been misidentified as *Pinus monophylla*, which should be considered in analyses. Stands in the possible transition zone may need to be revisited to confirm the identification of the pine species present in those areas.

Photo 8. Stand dominated by *Pinus californiarum* in the Santa Rosa Mountains of Riverside County (SCMV3106, 9/27/2024).

3.1.2.9 *Quercus durata* var. *gabrielensis* shrublands (n=11)

While the MCV has a *Quercus durata* Shrubland Alliance, that alliance was based on *Q. durata* Jeps. var. *durata*, which generally occurs on serpentine and not in the SCMV region. Efforts were made to sample at least ten *Q. durata* var. *gabrielensis* Nixon & C.H. Mull. stands (Photo 9) in the SCMV region to analyze relative to stands of *Q. durata* var. *durata*. These occur mostly in and near the south side of the San Gabriel Mountains and do not occur on serpentine. These stands could possibly be treated as an association of the *Quercus durata* Shrubland Alliance but may fit better in another alliance. *Quercus durata* var. *gabrielensis* may be better treated at the species rank and may be more closely related to other *Quercus* species than to *Q. durata*. Much research on *Quercus* taxa is currently in progress. It is also worth noting that *Quercus durata* var. *gabrielensis* likely hybridizes with *Q. engelmannii* and *Q. berberidifolia* where their ranges meet. It is often difficult to tell if morphological variation in a stand is just due to high plasticity of *Quercus* species, due to hybridization, or a combination of both.

Photo 9. Stand dominated by *Quercus durata* var. *gabrielensis* in Claremont Hills Wilderness Park in the San Gabriel Mountains (SCMV3116, 3/19/2025).

3.1.2.10 Scree forblands (n=10)

Scree slopes were targeted for sampling as there are unique forbs growing in some not observed elsewhere. These are areas where small, loose rocks pile up along generally very steep slopes and vegetation is generally sparse but distinct from adjacent alliances. Scree sampling was biased towards the San Gabriel Mountains and further sampling there and elsewhere is recommended, especially in a wetter year to better detect the annual species. Within the San Gabriel Mountains, scree stands often included *Allium monticola* Davidson, *Diplacus johnstonii* (A.L. Grant) G.L. Nesom, and/or *Phacelia longipes* Torr. ex A. Gray (Photo 10). Other less common associates included *Brickellia nevinii* A. Gray, *Caulanthus amplexicaulis* S. Watson, *Chaenactis santolinoides* Greene, *Epilobium canum* (Greene) P.H. Raven, *Eriogonum nudum* Benth, *Eriogonum saxatile* S. Watson, *Eriophyllum confertiflorum* (DC.) A. Gray, *Mentzelia laevicaulis* (Douglas ex Hook.) Torr. & A. Gray, *Pellaea mucronata* (D.C. Eaton) D.C. Eaton, *Salvia columbariae* Benth, *Stephanomeria cichoriacea* A. Gray, and *Stephanomeria pauciflora* (Torr.) A. Nelson. Some of these less commonly sampled associates may tend towards more stabilized scree, scree with more soil, and/or rock outcrops, all of which are often adjacent to or within looser scree fields and all of which could represent associations of one or more rock dominated alliances with low vegetation cover.

Photo 10. A scree forbland in the San Gabriel Mountains with a relatively high cover of *Allium monticola* in flower (SCMV3166, 5/6/2025).

3.2 FLORISTICS

A total of 1,725 minimum rank vascular plant taxa (species, subspecies, and varieties) were documented in survey plant lists (Table 1). Many of these taxa were also documented as pressed specimens. A total of 954 specimens of ~575 vascular plant taxa, including 45 taxa with a California Rare Plant Rank (CRPR, CNPS 2026), were submitted to the Jepson Herbarium at UC Berkeley to be stored there for future use in botanical research and as reference specimens from this project. One third of the vascular plant taxa documented during the project were vouchered. An additional 30 specimens of bryophytes were sent to an expert to check identifications and will be deposited in the herbarium once the identifications are confirmed.

TABLE 1. NUMERICAL SUMMARY OF MINIMUM RANK VASCULAR PLANT TAXA DOCUMENTED

Lifeform	Total Native Taxa	Total Non-native Taxa	Total taxa
Fern	31 (100%)	0 (0%)	31
Forb	934 (86%)	148 (14%)	1082
Graminoid	154 (70%)	65 (30%)	219
Shrub	302 (95%)	15 (5%)	317
Tree	55 (72%)	21 (28%)	76
Grand Total	**1476 (86%)**	**249 (14%)**	**1725**

A total of 142 taxa with a CRPR were documented during surveys. Of these, 73 taxa were CRPR 1B, six were CRPR 2B, one was CRPR 3, and 62 were CRPR 4. Appendix D lists these taxa with their CRPR and shows which field alliances they were found in. Appendix E lists 142 field alliances that included rare plant taxa and which rare taxa were documented in each. Note that data is likely incomplete regarding rare plant occurrences in alliances and vegetation stands. Taxa with low cover values were not always recorded for rapid assessment surveys, relevé surveys often only included a portion of a stand, many alliances were under sampled relative to others, and surveys may not have been conducted during an optimal year or time of year to detect all rare taxa.

Significant range extensions of three taxa were documented during this project. One of these, an *Artemisia*, is taxonomically problematic and likely found in multiple areas of the project. Additionally, a *Cryptantha* species found in Ventura County may be new to science. These noteworthy taxa are discussed in Appendix F.

3.3 COMMUNITY ENGAGEMENT

In addition to the focused survey efforts by field staff, CNPS held events to engage community members in this project. Community members had the opportunity to learn about the Manual of California Vegetation and the vegetation sampling protocol through events called “Veg-a-thons” where interested volunteers were invited to work alongside CNPS staff collecting SCMV data.

During the 2025 sampling year for this project, CNPS conducted two Veg-a-thons that were open to the public. One was held in the Big Bear Lake area in San Bernardino County, and the other took place in the Angeles National Forest near Wrightwood, California, in both Los Angeles and San Bernardino Counties. Each Veg-a-thon attracted roughly 30 volunteers, some of whom were botanists while others were members of the public with varying degrees of plant knowledge, with significant support from local CNPS chapters. The Riverside-San Bernardino Chapter played a key role in the Big Bear event, while the San Gabriel Mountains Chapter contributed volunteers and expertise to the Veg-a-thon in the Angeles National Forest.

The two Veg-a-thons were three days long. Volunteers were grouped with experienced field sampling members of our team. A training was held at the start of each session to familiarize volunteers with the sampling protocol. Teams then traveled to field sites away from the base camp to collect vegetation surveys. Volunteers were able to visit a range of habitat types within the project area, giving them firsthand exposure to the vegetation communities we were documenting. Also, many CNPS chapter volunteers had first-hand knowledge of vegetation stands important to sample in the region and/or local botanical expertise that assisted in the sampling effort. At the end of each day, volunteers worked alongside botanists at the base camp to identify unknown plants using dichotomous keys and microscopes, creating a hands-on learning environment that deepened engagement with the project and fostered enthusiasm for botanical science.

Pairing volunteers with experienced staff created opportunities for mentorship and allowed participants to gain confidence in plant identification and survey methods. This community participation not only supported data collection but helped build local awareness of the importance of vegetation mapping for conservation planning.

4 RECOMMENDATIONS

Feedback for an improved revision of the CNPS-CDFW Protocol for Combined Vegetation Rapid Assessment and Relevé Sampling was presented to CDFW and CNPS throughout the course of this project. Additional recommendations for future projects using this protocol and for further sampling within the SCMV project region follow.

4.1 PLANT TAXON PICKLIST

CDFW-provided a plant taxon picklist for this project that is an extraction from the USDA plants table, tailored to California. This list was missing 100s of California taxa including over 100 documented taxa that were encountered during the SCMV project surveys. This meant a placeholder name was entered for data entry and additional steps were needed to later correct this once each taxon was added to the picklist. This equated to a significant amount of extra work related to data entry and data QC.

The CDFW-provided taxon picklist also included illegitimate homonyms, which are duplicate names with a different author that linked to taxa other than the accepted name that was entered. For example, it included both *Yucca brevifolia* Engelm. and the illegitimate *Yucca brevifolia* Schott ex Torr. (a synonym of *Yucca baccata* var. *brevifolia* L.D. Benson & Darrow). Inclusion of illegitimate homonyms can lead to data entry errors and issues in data analysis.

CDFW is working to improve this list for future projects. Regardless of improvements, which may resolve all issues, we recommend the plant list used for data entry be checked for missing taxa from the survey region and illegitimate homonyms before being used on future projects to provide for a more efficient workflow and reduced data entry errors. As a result of feedback from this project, a December 2024 version of Jepson eFlora was used to update the plant list with several hundred species that were previously missing, and illegitimate taxon names were flagged to be removed from future picklists. Moving forward, this will provide an up-to-date list to work from that is hopefully free of illegitimate homonyms and taxa that do not occur in California. This list should also regularly incorporate any taxon changes and additions from the yearly Jepson eFlora revisions.

4.2 STRATA OVERLAP

Some surveyors struggled with concepts related to percent cover overlap within and between strata. Adding clearer instructions, examples, and diagrams to the protocol may help alleviate this confusion. Surveyors that showed their overlap math made it easiest to detect if there were an overlap-related data issue and how to fix it.

In Appendix G, we have provided an example of a completed species list datasheet with overlap math, comments, and color-coding, which may help surveyors better understand how to calculate overlap for each field. This example also shows how to add

values that are less than 1% as some surveyors added the dummy values used for analyses (0.2 and 0.11) rather than the actual percent covers. This example datasheet (or a similar one) in combination with Venn diagrams illustrating simplified overhead views with overlap explanations may alleviate a lot of confusion related to percent cover overlap. Example Venn diagrams should show overlap within species, overlap within a stratum and between species, overlap between strata, etc. The Venn diagrams would ideally have the same values as the example datasheet so that surveyors can better make a connection between the two. Both the example datasheet and Venn diagrams should be a part of the protocol, at least attached as an appendix, so that surveyors have easy access to these resources and can print them out for field use.

4.3 FUTURE SAMPLING OPPORTUNITIES

Sampling for this project primarily focused on public lands, which was most efficient in covering the largest amount of area with the minimal number of permits. Future efforts should be made to sample private and Tribal lands that may provide data on alliances and variation within alliances not well represented by the current sampling.

Some permitted areas in the project area were not sampled or under-sampled due to restrictions (fire and other closures) or were less efficient to sample. While some difficult-to-access areas were sampled during overnight backpacking trips, large portions of the project area remain unsampled. Many of these unsampled areas may not provide any novel variation not already sampled in easier to access locations. However, some areas such as the high-elevation portions of San Gorgonio Peak in the San Bernardino Mountains (3000+ meters) or unsampled portions of the Santa Rosa Mountains are likely to have under- or unsampled vegetation types.

A subset of the stands sampled in 2024 subsequently burned during wildfire events later that year. In addition, several stands located within these burn perimeters were sampled during the first growing season following fire. These post-fire and pre-fire datasets present an opportunity for targeted resampling to evaluate vegetation response, recovery trajectories, and community change over time following burning.

Sampling of many herbaceous stands, especially in smaller and rarer areas like wet meadows, was limited by autocorrelation rules. Because of this, much variation within these areas was under sampled. Related, the 100 m^2 sampling size of relevé plots means that variation in larger herbaceous stands may be underrepresented and sampling may be biased towards purer patches of certain taxa. When mosaics of vegetation patches dominated by different taxa were found but with significant overlap between other taxa, it may be difficult to determine if such a mosaic should be considered a single stand of one alliance, a mosaic of stands of all one alliance but different associations, multiple stands of multiple alliances, or a combination thereof. A much higher level of sampling with relaxed autocorrelation rules may be needed to answer these questions. For example, delineating and sampling all stands in the wet meadows of the San Bernardino Mountains would give a much clearer picture of which

alliances and associations occur there and how they are related both to each other and to those in wet meadows of other regions.

For herbaceous stands, multiple samples of the same location from different times of year (and possibly different years) may be beneficial to tie together data from plants that are mostly only identifiable in late summer and early fall to those mostly only identifiable in the spring. To more clearly identify which spring alliances and associations are tied to which summer/fall alliances and associations, it may be most useful to first target late summer and fall flowering stands as these stands are less common and then revisit these in the spring.

The 2025 sampling season received below average precipitation. It would be valuable to resample herbaceous stands in a wetter year to assess how much precipitation-based variation there is in the cover and dominance of taxa within herbaceous alliances. Similarly, it may be valuable to revisit water dependent stands such as vernal pools in both wetter and dryer years. SCMV3091 and SCMV0248 from a small pond in northern Ventura County illustrate how sampling the same location nine months apart resulted in different alliance assignments, driven by contrasting hydrologic conditions. One survey documented higher water levels and pond vegetation during what would typically be considered the drier part of the year, while the other captured lower water levels and vernal pool or pond-margin vegetation during what is generally the wetter season.

A total of 2,325 stands representing 286 field alliances were sampled. Of these field alliances, 211 (74%) had fewer than 10 samples, suggesting that sampling intensity may be insufficient to fully evaluate many of these alliances. Some of these alliances are rare or uncommon and it may not be feasible to sample further within this region, while others could have variation at the association level in which additional sampling would be beneficial. Some alliances may already be better represented through sampling conducted as part of other regional projects. Any remaining alliances or potential alliances in this region that are poorly sampled should be prioritized in future survey efforts to support more robust classification analyses and MCV vegetation type concepts.

5 CITATIONS

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6 APPENDICES

Appendix A. Relevé and Rapid Assessment Field Form and Protocol

Appendix B. Field Personnel and Initials Used on Field Survey Forms and in Database

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APPENDIX A. RELEVÉ AND RAPID ASSESSMENT FIELD FORM AND PROTOCOL

Combined Vegetation Rapid Assessment and Relevé Field Form
(Revised August 23, 2022)

For Office Use:	Final database #:	Final vegetation type: Alliance Association

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION — circle: Relevé or RA

Database #:	Date:	Name of recorder:
		Other surveyors:
	UID:	Location Name:

GPS name: _____ For Relevé only: Bearing°, left axis at ID point____ of Long / Short side

UTME ___ ___ ___ ___ ___ ___ UTMN ___ ___ ___ ___ ___ ___ ___ Zone: 11 NAD83 GPS error: ft./ m./ PDOP ____

Decimal degrees: LAT ___ ___ . ___ ___ ___ ___ ___ ___ LONG ___ ___ ___ . ___ ___ ___ ___ ___ ___

GPS within stand? Yes / No If No, cite from GPS to stand: distance (m) ____ bearing ° ____ inclination ° ____

and record: Base point ID _____ Projected UTMs: UTME ___ ___ ___ ___ ___ ___ UTMN ___ ___ ___ ___ ___ ___

Camera Name: Cardinal photos at ID point:

Other photos:

Stand Size (acres): <1, 1-5, >5 | Plot Area (m^2): 100 / _____ | Plot Dimensions ____ x____ m | RA Radius____ m

Exposure, Actual °: _____ NE NW SE SW Flat Variable | Steepness, Actual °: _____ 0° 1-5° > 5-25° > 25

Topography: Macro: top upper mid lower bottom | Micro: convex flat concave undulating

Geology code: _____ Soil Texture code: _____ | Upland or Wetland/Riparian (circle one)

% Surface cover:	(Incl. outcrops)	(>60cm diam)	(25-60cm)	(7.5-25cm)	(2mm-7.5cm)	(Incl sand, mud)	
H_20:	BA Stems:	Litter:	Bedrock:	Boulder:	Stone:	Cobble:	Gravel:	Fines:	=100%

% Current year bioturbation _____ Past bioturbation present? Yes / No | % Hoof punch _____

Fire evidence: Yes / No (circle one) If yes, describe in Site history section, including date of fire, if known.

Site history, stand age, comments:

Disturbance code / Intensity (L,M,H): ____/___ ____/___ ____/___ ____/___ ____/___ "Other" _____ / ___

II. HABITAT DESCRIPTION

Tree DBH : T1 (<1" dbh), T2 (1-6" dbh), T3 (6-11" dbh), T4 (11-24" dbh), T5 (>24" dbh), T6 multi-layered (T3 or T4 layer under T5, >60% cover)

Shrub: S1 seedling (<3 yr. old), S2 young (<1% dead), S3 mature (1-25% dead), S4 decadent (>25% dead)

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.)

Desert Riparian Tree/Shrub: 1 (<2ft. stem ht.), 2 (2-10ft. ht.), 3 (10-20ft. ht.), 4 (>20ft. ht.)

Desert Palm/Joshua Tree: 1 (<1.5" base diameter), 2 (1.5-6" diam.), 3 (>6" diam.)

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: _____

Field-assessed Association name (optional): _____

Adjacent Alliances/direction: _____/_____, _____/_____

Confidence in Alliance identification: L M H Explain: _____

Phenology (E,P,L): Herb____ Shrub____ Tree____ Other identification or mapping information:

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Combined Vegetation Rapid Assessment and Relevé Field Form

(Revised August 23, 2022)

Database #: __________ SPECIES SHEET **Recorder & Date:** ________________

IV. VEGETATION DESCRIPTION

% NonVasc cover:____ Total % Vasc Veg cover:_____

<u>% Cover</u> - Conifer tree / Hardwood tree: _____/_____ **Regenerating Tree:** _____ **Shrub:** _____ **Herbaceous:** _____

<u>Height Class</u> - Conifer tree / Hardwood tree: _____/_____ **Regenerating Tree:** _____ **Shrub:** _____ **Herbaceous:** _____

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular
% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination

Unusual species: ____

CDFW-CNPS Protocol for the

Combined Vegetation Rapid Assessment and Relevé Field Form

(April 16, 2024)

Introduction

This protocol describes the methodology for both the Relevé and Rapid Assessment (RA) vegetation sampling techniques as recorded in the Combined Vegetation Rapid Assessment and Relevé Field Form. The same environmental data are collected for both techniques. However, the relevé is a plot demarcated with a measuring tape, and all species within the plot are recorded along with cover values. The rapid assessment sample is not based on a taped plot, but is based on a visually estimated, usually circular area within a representative portion of the entire stand, with up to 20 of the dominant or characteristic species and their cover values recorded.

In general, collect rapid assessments in woody vegetation and relevés in herbaceous vegetation. When working in an area that has not been sampled before, RAs in woody vegetation may list more than 20 species.

Defining a Stand

A stand is the basic physical unit of vegetation in a landscape. It has no set size. Some vegetation stands are very small, such as a portion of a vernal pool, and some may be several square kilometers in size, such as a forest type.

A stand is defined by three main unifying characteristics:

1) It has compositional integrity. Throughout the site, the combination of species is similar. The stand is differentiated from adjacent stands by a discernable boundary that may be abrupt or indistinct.

2) It has structural integrity. It has a similar history or environmental setting that affords relatively similar horizontal and vertical spacing of plant species. For example, a hillside forest originally dominated by the same species that burned on the upper part of the slopes but not the lower would be divided into two stands. Likewise, sparse woodland occupying a slope with very shallow rocky soils would be considered a different stand from an adjacent slope with deeper, moister soil and a denser woodland or forest of the same species.

3) It is typically a repeating pattern on the landscape, in which the plant assemblage occurs in other sites with similar plant composition and environmental setting.

The structural and compositional features of a stand are often combined into a term called homogeneity. For an area of vegetated ground to meet the requirements of a stand, it must be homogeneous (uniform in structure and composition throughout).

Stands vary in size and may be sampled even if they are below a “minimum mapping unit” area (a mapping rule of set size such as 1 acre or 1/2 acre specific to a mapping project). For example, a vernal pool is often mapped at the group level because it is

small in area, while multiple vernal pool alliances or associations may exist and be sampled as separate stands within a broader map polygon.

Selecting a bounded plot (Relevé) or representative area (Rapid Assessment) to sample within a stand

Stands to be sampled may be selected by evaluation prior to a site visit (e.g., from aerial photos) or they may be selected on site during reconnaissance to determine extent and boundaries, location of other similar stands, etc.

Because many stands are large, it may be difficult to summarize the species composition, cover, and structure of an entire stand. A sample of vegetation is selected to be representative of the entire stand and should be conducted in a standardized way to ensure that it can be compared to samples of other stands. This means that you are not randomly selecting a plot; on the contrary, you are actively using your own best judgment to find a representative example of the stand.

Selecting a relevé plot or RA area requires that you see enough of the stand you are sampling to feel comfortable in choosing a representative plot location. Take a brief walk through the stand and look for variations in species composition and in stand structure. In hilly or mountainous terrain, look for a vantage point from which you can get a representative view of the whole stand. Variations in vegetation that are repeated throughout the stand should be included in your plot. Once you assess the variation within the stand, attempt to locate a sample area that captures the stand's common species composition and structural condition.

Tracking sampled vegetation types

For large projects, the number of samples should be tracked daily or weekly by field-assessed Alliance and Association type so that samples are distributed as evenly as possible over types and time is not wasted collecting excessive numbers of samples of certain types. When multiple teams are in the field in the same week, daily communication between teams about Alliances and Associations sampled can ensure even sampling*. Prior to selecting a stand to sample, determine if what you are going to sample is needed based on this tracking.*

Selecting samples to avoid spatial autocorrelation

Do not place more than one sample within a stand. For large projects, separate sample locations to limit spatial autocorrelation. Try to spread samples representing the same vegetation type at least 500 to 1000 meters apart. When possible, do not sample adjacent stands, especially if the adjacent stand is within the same life form (tree, shrub, herb). For example, samples taken from different formations, subclasses, or classes (e.g., wetlands vs. uplands, lithomorphic vs. mesomorphic) adjacent to one-another have a lower probability of sharing species and may be sampled within 1000 meters of each other. However, avoid sampling adjacent stands that tend to have overlapping species even if they are technically different formations, such as a grassland adjacent to an open oak woodland. Flexibility may be necessary in the case of sensitive natural

community types that may have limited sampling opportunities across the landscape or in cases where there are obvious ecological distinctions between adjacent stands and they share very little species overlap (e.g., distinct rings of a single vernal pool or variation within a single fen).

Plot Size

All relevés of the same type of vegetation need to be an equivalent size if they are to be analyzed together. Plot size is dependent on the type of vegetation under study. Therefore, general guidelines for plot sizes of tree, shrub, and herbaceous communities have been established. Sufficient work has been done in temperate vegetation to be confident the following conventions will capture a comprehensive list of species:

Herbaceous communities: 100 m2 plot

Special herbaceous communities of small size, such as vernal pools, fens: 10 m2 plot

Shrublands and riparian forest/woodlands: 400 m2 plot

Open desert and other shrublands with widely dispersed but regularly occurring woody species: 1000 m2 plot

Upland Forest and woodland communities: 1000 m2 plot

Plot Shape

A relevé has no fixed shape, though plot shape should reflect the character of the stand and is either a square, rectangle, or circle. Adjust the orientation and dimensions of the plot to represent the best approximation of stand homogeneity. If the stand is about the same size as a Relevé, the plot boundaries may be similar to that of the entire stand. If sampling streamside riparian or other linear communities, the plot dimensions should not go beyond the community's natural ecological boundaries. Thus, a relatively long, narrow plot capturing the vegetation within the stand, but not outside it, would be appropriate. Overarching plants do not need to be rooted within the plot to be included in the species list, however, species present along the edges of the plot that are clearly part of the adjacent stand should be excluded from the plot.

Location of GPS Points

For Relevés, one point will be considered the plot identifier (ID point) and should be in the SW corner of a rectangular or square plot, if possible, or in the center of a circular plot. If it is taken in another location, this should be noted in the Site History section.

Definitions of fields in the Field Form

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION

Relevé or RA: Circle the appropriate survey type.

Database #: This is the unique ID number for Relevés and Rapid Assessments, in the form of *PPPPxxxx*, where *PPPP* is the 4-character project code and *xxxx* is a unique 4-digit number (e.g. CARR0001 for Carrizo sample #1). If this is a long-term plot, a

character from A to Z can be added to the unique ID for each re-sampling survey; so the first re-sample for CARR0001 would be CARR0001A.

Base Points: For a projected RA (GPS within stand = No), a Base Point will be taken where the surveyors are standing and a separate point will be projected into the stand. The ID of the basepoint is B_*PPPPxxxx*, i.e. B_CARR0001.

Photo Points: Occasionally, stand photos will be taken from a vantage point outside the stand, or in a place other than the survey point. The ID for this point is *PPPPxxxx*_P#, i.e. the first Photo Point for CARR0001 will be CARR0001_P1.

Date: Date of the sampling.

UID: The unique ID number of a reference point or allocation target that this survey describes (optional).

Name of recorder: The full name of the recorder should be provided on the first field form of the day. On successive forms, initials can be recorded.

Other Surveyors: The full names of each person assisting should be provided on the first field form of the day. On successive forms, initials of each person assisting can be recorded.

Location Name: The name of the property, location, park, or landowner name of permitted private properties. E.g. the specific name of the County Regional Park (Gibson Ranch), USFS (Angeles NF), BLM property (Mojave Trails NM) or the owner name of a private parcel as it appears on your permit. Specific descriptions of where the stand and observer are within the stand belongs in the Site History field. Roadside/Right of Way surveys must include “Roadside” before the property name.

GPS name: The name/number assigned to each GPS unit. This can be the serial number if another number is not assigned.

Bearing°, left axis at ID point of Long / Short side: Relevé only. For square or rectangular plots: from the ID Point, looking towards the plot, record the bearing of the axis to your left. If the plot is a rectangle, indicate whether the left side of the plot is the long or short side of the rectangle by circling “long” or “short” side (no need to circle anything for square plots). If there are no stand constraints, set up the plot with boundaries running in the cardinal directions and place the ID Point in the SW corner.

UTM coordinates: Easting (**UTME**) and northing (**UTMN**) location coordinates using the Universal Transverse Mercator (UTM) grid. Record the information from your GPS unit. These coordinates are always the base point of the survey. Soil samples and photos are taken from this point, and exposure, steepness, topography, etc. are measured here. If the GPS point is not within the stand (i.e., the point is projected or digitized in the field), these are the UTMs of the base point. Important: a projected point or a point digitized in the field must always have a base point associated with it (projected surveys with estimates of distance and bearing are preferred over digitization). A base point can serve as the base for several distance surveys.

For Relevé plots, take the waypoint in the southwest corner of the plot whenever possible or in the center of a circular plot.

Zone: Universal Transverse Mercator zone. Zone 10 is for California west of the 120th longitude; zone 11 is for California east of 120th longitude (the straight portion of California's eastern boundary).

NAD83: This is the default GPS datum. If you use a different one, cross this out and write in the correct datum.

GPS error: ft./ m./ PDOP: Circle the appropriate unit of measure and record the error reading from the GPS unit.

Decimal degrees: *Use this only if your GPS unit will not record UTM coordinates.* Latitude–Longitude reading in decimal degrees. Record the information from your GPS unit. These coordinates are always the base point of the survey. Soil samples and photos are taken from this point, and exposure, steepness, topography, etc. are measured here.

For Relevé plots, take the waypoint in the southwest corner of the plot whenever possible or in the center of a circular plot.

GPS within stand? Yes / No: Circle "Yes" to denote that the GPS waypoint was taken directly within or at the edge of the stand being assessed for a Rapid Assessment, or circle "No" if the waypoint was taken at a distance from the stand (such as with a binocular view of the stand). If the point is taken at the edge of the stand, note direction to the center of the stand.

If No, cite from GPS to stand: distance (m), bearing°, inclination°: From the base GPS point, measure the distance to the projected point using a range finder. Record the compass bearing from the base point to the projected point; record the inclination if the base and projected points are not at the same elevation. **and record Base point ID:** This is the ID of the base GPS point, where the surveyors were standing to record the distance survey. This is required for both projected points and points digitized in the field (gathering projection data is preferred). **and Projected UTMs:** These are the coordinates of the projected point, the point being surveyed. They are generated in the field if the GPS units have the ability to calculate projected points. If the GPS unit does not have this capability, make a note to that effect and leave these fields blank. Note that a digitized point, e.g., using your finger to plunk the location that you are surveying in Collector, is NOT a projected point and is not recommended.

Camera Name: Write the camera name or code as identified by the users.

Cardinal photos at ID point: Take four photos in landscape orientation for each cardinal direction (N, E, S, W) starting clockwise towards the north, from the ID Point, and record the jpeg numbers here. This symbol can be used to indicate the cardinal photos: . Try to include the horizon line in each photo (if possible while getting a good representation of the vegetation). If this is a distance survey to a projected point, take

the four cardinal photos at the base point and at least one photo of the stand. A digital camera with a minimum 10 megapixel resolution is required.

Other photos: This may include cardinal photos at additional corners or other relevant photos. We recommend a diagonal photo facing NE from the SW corner when sampling an herbaceous relevé. Notes regarding photo locations or subjects can go here.

Stand Size: Estimate the size of the entire stand in which the sample is taken. As a measure, one acre is about 4,000 square meters (approximately 64 x 64 m), or 208 feet by 208 feet. One acre is similar in size to a football field.

Plot Area (m2): Relevé only. Circle “100” for a 100m2 plot or record the appropriate plot size.

Plot Dimensions: Relevé only. Record the length and width of the plot in meters.

RA Radius: Rapid Assessments only. Estimate the radius of the area of the stand viewable from your sample point. This value is separate from the Stand Size of vegetation being sampled and any additional details/constraints can be documented in the Site History.

The radius must fall completely within the stand boundary and therefore cannot be greater than the distance from the sample point to the edge of the stand in any direction. If you can see the entire stand, then the radius will be the distance from your GPS point to the closest edge of the stand. For example, the radius will be constrained in long linear stands to the minimum width of the stand and thus the RA radius may not capture the full area that you survey. If your point is on the edge of the stand, record the radius into the stand, but note your location and the direction to which the RA Radius applies in the Site History section. RA Radius informs mappers and the image analysts of the dimensions of the stand visible from the sample point, so they can make connections between the vegetation on the ground and information in imagery and other GIS datasets.

Exposure: (Enter Actual º and circle general category): While facing in the general downhill direction, read degrees of the compass for the aspect or the direction you are standing, using degrees from north, adjusted for declination. Average the reading over the entire stand, even if you are sampling a Relevé plot, since your plot is representative of the stand. If estimating rather than measuring the exposure, write “N/A” for the actual degrees, and circle the general category chosen. “Variable” may be selected if the same, homogenous stand of vegetation occurs across a varied range of slope exposures.

Steepness: (Enter Actual º and circle general category): Read degree slope from your clinometer or compass with built in clinometer by following the manufacturer’s directions for use. Make sure to average the reading across the entire stand, even if you are sampling in a Relevé plot, since your plot is representative of the stand. If estimating rather than measuring, write “N/A” for the actual degrees, and circle the general category chosen.

Topography: First assess the broad (**Macro**) topographic feature or general position of the stand relative to the immediately surrounding landscape. This attribute does not refer to the watershed as a whole, but to a cross section of the topography at the location of your stand. For instance, if your stand is located along a small creek in a narrow, v-shaped canyon, your position would be at the "Bottom," even if the canyon itself slopes downward. Since stands can occupy more than just a single slope position, **circle all the positions that apply**.

Then, assess the local (**Micro**) topographic features or the lay of the area within the stand being sampled (e.g., surface is flat or concave). **Circle only *one* of the microtopographic descriptors**.

Geology code: Geological parent material of stand. If exact type is unknown, use a more general category (e.g., igneous, metamorphic, sedimentary). *See code list for types*.

Soil Texture code: Record soil texture that is characteristic of the plot (*e.g.,* coarse loamy sand, sandy clay loam). *See soil texture key for types.*

Upland or Wetland/Riparian: Indicate if the stand is in an upland or wetland/riparian setting. (wetland and riparian are one category.) Note that a site need not be officially delineated (as in the Army Corps of Engineer's wetland delineation protocols) as a wetland to qualify as such in this context (e.g., seasonally wet meadow).

% Surface cover: The abiotic substrates of the plot. The total should sum to 100%. It is helpful to imagine "mowing off" all of the live vegetation at the base of the plants and removing it – you will be estimating what is left covering the surface. Note that non-vascular cover (lichens, mosses, cryptobiotic crusts), including "basal area" of ground attachment, is not estimated in this section.

H2O: Percent surface cover of running or standing water, ignoring the substrate below the water.

BA Stems: Percent surface cover of the basal area of vascular plant stems at the ground surface. For most vegetation types, BA is 1-3% cover.

Litter: Percent surface cover of litter, thatch, duff, or wood on the ground.

Bedrock: Percent surface cover of bedrock, including outcrops.

Boulder: Percent surface cover of rocks >60 cm in the longest dimension.

Stone: Percent surface cover of rocks >25–60 cm in the longest dimension.

Cobble: Percent surface cover of rocks >7.5–25 cm in the longest dimension.

Gravel: Percent surface cover of rocks 2 mm–7.5 cm in the longest dimension.

Fines: Percent surface cover of bare ground and fine sediment <2 mm in the longest dimension (*e.g.,* dirt, sand).

% Current year bioturbation: Estimate the percent of the plot exhibiting soil disturbance by any organism that lives underground. Do not include disturbance by ungulates. Note that this is a separate estimation from surface cover.

Past bioturbation present? Circle Yes if there is evidence of bioturbation from previous years in the plot.

% Hoof punch: Note the percent of the plot surface that has been punched down by hooves (cattle or native grazers) in wet soil. Depressions must be >2 cm deep.

Fire Evidence: Circle Yes if there is visible evidence of fire within the stand, and note the type of evidence in the "Site history, stand age, comments section," for example, "charred dead stems of *Quercus berberidifolia* extending 2 feet above resprouting shrubs." If you are certain of the year of the fire, put this in the Site history section. You may also record more general historic information if you lack the precise date of a fire (such as most recent fire appears to be 10-20 years ago).

Site history, stand age, comments: Briefly describe the stand including details about age/seral stage, disturbance history, nature and extent of land use, and other environmental and vegetation factors, such as distribution of species. Examples of disturbance history: fire, landslides, avalanching, drought, flood, animal burrowing, or pest outbreak. Also, try to estimate year or frequency of disturbance. Examples of land use: grazing, timber harvest, or mining. Examples of other site factors: exposed rocks, soil with fine-textured sediments, high litter/duff build-up, multi-storied vegetation structure, or other stand dynamics. Note any structural and phenological constraints to estimates of strata cover and height and any peculiarities of the site or observation that impact the vegetation measurements taken. Examples include: late phenology within deciduous tree stands reducing cover estimates or pygmy forests or other stunted growth. Include any additional details or constraints about the extent of the area assessed, meaning the area that has contributed to strata, height, and cover estimates. Also include any important site information about the location of the stand or the observers, like adjacency to something visible on imagery or something like "point taken near the north boundary of the stand because of steep slope"

Disturbance code / Intensity (L,M,H): List codes for potential or existing impacts on the stability of the plant community. See code list for impacts and definitions of levels of disturbance. Characterize each impact each as **L** (=Light), **M** (=Moderate), or **H** (=Heavy). Disturbance is evaluated on a stand basis.

II. HABITAT AND VEGETATION DESCRIPTION

California Wildlife Habitat Relationships (CWHR)

For CWHR, identify a size/age/height class for the plot using the following tree, shrub, and/or herbaceous categories. These categories are based on functional life forms. This

data links the structural components of sampled stands within the SCV classification to the CWHR classification.

Tree DBH: Circle one of the tree size classes provided when the tree canopy closure exceeds 10% of the total cover, or if young tree density indicates imminent tree dominance. Size class is based on the average diameter at breast height (dbh) of each trunk (standard breast height is 4.5ft or 137cm). When marking the main size class, make sure to estimate the mean diameter of all trees over the entire stand, weighing the mean toward the larger tree dbh's if large trees are consistent in the stand, though they may be low in cover. The "**T6 multi-layered**" dbh size class signifies a multi-layered tree canopy, with a size class T3 and/or T4 layer growing under a T5 layer and a distinct height separation between the classes. Stands in the T6 class must contain a total absolute tree cover that exceeds 60% including at least 10% cover of size class 5 (>24" dbh) trees growing over a distinct layer of trees in size classes 3 (>6-11" dbh) or 4 (>11-24" dbh) with at least 10% combined cover. RA/Relevé Field Protocol Page 8 of 11

Shrub: Circle one of the shrub classes provided when shrub canopy closure exceeds 10% (except in desert types) by recording which class is predominant in the survey. Shrub class is based on the average amount of crown decadence (dead standing vegetation on live shrubs when looking across the crowns of the shrubs).

Herbaceous: Circle one of the herb height classes when herbaceous cover exceeds 2% by recording the predominant class in the survey. Note*: This height class is based on the average plant height at maturity, not necessarily at the time of observation.*

Desert Riparian Tree/Shrub: Circle one of the size classes by measuring mean stem height (whether tree and/or shrub stand).

Desert Palm/Joshua Tree: Circle one of the palm or Joshua tree size classes by averaging all the stem-base diameters (i.e., mean diameter of all stem-base sizes). Diameter is measured at the plant's base above the bulge near the ground.

III. INTERPRETATION OF STAND

Field-assessed vegetation Alliance name: Enter the name of the Alliance following the Manual of California Vegetation (MCV) Online. Please use scientific nomenclature, *e.g., Quercus agrifolia* forest. Alliance and association names in the MCV follow the USDA Plants nomenclature in order to conform with the national standard. An Alliance is based on the dominant or diagnostic species of the stand, and usually reflects the uppermost and/or dominant height stratum. A dominant species tends to cover the greatest area, while a diagnostic species is consistently found in some vegetation types but not others.

The field-assessed Alliance name may not always exist in the current MCV, in which case you can provide a new or proposed Alliance name in this field. If this is the case, also make sure to state that it is not in the MCV under "Explain" below.

Field-assessed Association name (optional): Enter the name of the species in the Alliance and additional dominant/diagnostic species from any strata. In following naming conventions, species in differing strata are separated with a slash, and species in the uppermost stratum are listed first (*e.g., Quercus douglasii / Toxicodendron diversilobum*). Species in the same stratum are separated with a dash (*e.g., Quercus lobata – Quercus douglasii)*.

The field-assessed Association name may not exist in the current MCV, in which you can provide a new or proposed Association name in this field.

Adjacent Alliances/direction: Identify other vegetation types that are directly adjacent to the stand being assessed by noting the dominant species (or known type). Also note the distance in meters from the GPS waypoint and the direction (general or in degrees) of the adjacent alliance (*e.g., Amsinckia tessellata* / 50m, 360° N or *Eriogonum fasciculatum* / 100m, 110°).

Confidence in Alliance identification: (L, M, H) With respect to the "Field-assessed Alliance name," note whether you have L (=Low), M (=Moderate), or H (=High) confidence in the interpretation of this Alliance name.

Explain: Please elaborate if your "Confidence in Alliance identification" is low or moderate. Low confidence can occur from such things as a poor view of the stand, an unusual mix of species that does not meet the criteria of any described Alliance, or a low confidence in your ability to identify species that are significant members of the stand.

Phenology: Indicate early (E), peak (P), or late (L) phenology for each of the strata. For herbs, this generally indicates if species are in flower and/or fruit and are therefore identifiable. For shrubs and trees, this attribute generally refers to cover, e.g., a tree that is fully leafed out will be considered peak (P) even if it is not in flower. Phenology is useful for cover estimation and species identification issues and can be elaborated upon in the next field or in the Site History.

Other identification or mapping information: Discuss any further problems with the identification of the assessment or issues that may be of interest to mappers. Note if this sample represents a type that is likely too small to map.

IV. VEGETATION DESCRIPTION

Database #: Copy the database # from Page 1.

Overall Cover of Vegetation

Provide an estimate of cover for the life-form categories below. Record a specific number for the total aerial cover or "bird's-eye view" looking from above for each category, estimating cover for living plants only. Litter/duff should not be included in these estimates.

The *porosity* of the vegetation should be taken into consideration when estimating percent foliar cover for all categories below: consider how much of the sky you can see when you are standing under the canopy of a tree, or how much light passes through the canopy of the shrub layer to help you estimate foliar cover.

% NonVasc cover: The total cover of all lichens, bryophytes (mosses, liverworts, hornworts), and cryptogamic crust on substrate surfaces including downed logs, rocks and soil, and horizontal surfaces (tree branches) but not on standing or inclined trees or vertical rock surfaces.

Total % Vasc Veg cover: The total cover of all vascular vegetation taking into consideration the porosity, or the holes, in the vegetation, and disregarding overlap1

1 Porosity reduces the total cover of the canopy. Overlapping strata should not be included in the total cover percent; for instance, if a shrub is growing under a tree, only the cover of the tree will be added into the total; the cover of the shrub will be disregarded, except for the amount by which it fills in the porosity of the tree canopy. of the various tree, shrub, and/or herbaceous layers and species.

% Cover by Layer

Conifer Tree /Hardwood Tree: The total foliar cover (considering porosity) of all live tree species, disregarding overlap1 of individual trees. Estimate conifer and hardwood covers separately. **Please note:** These cover values should not include the coverage of regenerating tree species (i.e., tree seedlings and saplings).

Regenerating Tree: The total foliar cover of seedlings and saplings, disregarding overlap1 of individual recruits. See seedling and sapling definitions below.

Shrub: The total foliar cover (considering porosity) of all live shrub species disregarding overlap1 of individual shrubs.

Herbaceous: The total cover (considering porosity) of all herbaceous species, disregarding overlap1 of individual herbs.

Height Class by Layer

Note the modal height for conifer tree / hardwood tree, regenerating tree, shrub, and herbaceous categories. Modal height is based on the count of the most frequent height of plants within each layer. Record a modal average height value for each category by estimating the mean height for each group. Please use the following height intervals to record a height class: 1 = <1/2 m, 2 = 1/2-1 m, 3 = 1-2 m, 4 = 2-5 m, 5 = 5-10 m, 6 = 10-15 m, 7 = 15-20 m, 8 = 20-35 m, 9 = 35-50 m, 10 => 50 m.

Note: For the herbaceous layer height, this height class is based on the modal average plant height at the time of observation, as opposed to how this is recorded in the CWHR section (at maturity).

Species List and Coverage

For Rapid Assessments: List up to 20 species that are dominant or that are characteristically consistent within the assessment area. These species may or may not be abundant, but they should be consistent representatives in the survey. When different layers of vegetation occur, make sure to list species from each stratum. As a general guide, make sure to list at least 1-2 of the most abundant species per stratum. There is a heavy line on the form under the 20th line to limit the RA section of the species list. *Note: If constant, diagnostic, or interesting species occur outside the assessment area but in the stand, list the species and estimated stand cover in the Site History section.*

For Relevés: list all species present in the plot, using a second species list page if necessary. ** If using a second species list page, note “Continued” on the bottom of the first page and be sure to note the Database # on the second page.

For both sample types, provide the stratum:

T = Tree. A woody perennial plant that has a single trunk.

A = SApling. 1" - <6" dbh and young in age, OR small trees that are <1” dbh, are clearly of appreciable age, and are kept short by repeated browsing, burning, or other disturbance. Includes trees that are re-sprouting from roots or stumps following fire, logging or other disturbance. These re-sprouts may exhibit a shrubby form, with multiple small trunks, but are species that are generally considered trees. If a majority of the trunks are >6” dbh, then the re-sprouts would be included under the “Tree” stratum.

E = SEedling. A tree species clearly of a very young age that is <1” dbh OR has not reached breast height. Applies only to trees propagating from seed; resprouts are not recorded here even if they meet the size requirements.

S = Shrub. A perennial, woody plant, that is multi-branched and doesn’t die back to the ground every year.

H = Herb. An annual or perennial that dies down to ground level every year.

N = Non-vascular. Includes moss, lichen, liverworts, hornworts, cryptogammic crust, and algae.

Be consistent and don’t break up a single species into two separate strata. The only time it would be appropriate to do so is when one or more tree species are regenerating, in which case the SEedling and/or SApling strata should be recorded for that species. These may be noted on the same line, e.g.:

Strata	Species	% Cover	C
T/A/E	Quercus douglasii	40/<1/<1	

In some cases, the stratum of a particular species might not be obvious. Some examples are *Juniperus californica,* which has the size and growth habit of a shrub, but it is considered a tree, and mistletoe, which is considered a shrub. It is useful to have a list of species with ambiguous strata for each project. Consult the MCV or contact VegCAMP if you are unsure.

C. If a species collection is made, it should be indicated in the collection column with a "C" (for collected). If the species is later keyed out, cross out the species name or description and write the keyed species name in pen on the data sheet. Do not erase what was written in the field, because this information can be used if specimens get mixed up later. If the specimen is then thrown out, add a "T" to the "C" in the collection column (CT = thrown out after confirmation) or cross out the "C". If the specimen is kept but is still not confidently identified, add a "U" to the "C" in the collection column (CU = collected and unconfirmed). In this case the unconfirmed species epithet should be put in parentheses [*e.g., Hordeum (murinum)*]. If the specimen is kept and is confidently identified, add a "C" to the existing "C" in the collection column (CC = collected and confirmed). If the specimen is later deposited in an herbarium, add a "D" to the existing "C" in the collection column (CD = collected and deposited) and note the receiving herbarium.

Using Jepson eFlora nomenclature, write out the scientific name of each plant to the finest taxonomic level possible. In general, do not abbreviate names except for dominant species that do not have ambiguous codes. If you aren't sure there aren't duplicate codes, don't use a code. When uncertain of an identification (which you intend to confirm later) use parentheses to indicate what part of the determination needs to be confirmed. For example, you could write out *Brassica* (*nigra*) if you are sure it is a *Brassica* but you need further clarification on the specific epithet.

Provide the % absolute foliar cover for each species listed, considering porosity. When estimating, it is often helpful to think of coverage in terms of the following cover intervals at first:

<1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%.

Record the <1% cover in one of two categories:

"+" for <1% but not rare or solitary individuals (in most cases)

"r" for rare in plot or solitary individuals.

Keeping these classes in mind, refine your estimate to a specific percentage. The sum of all species percent covers may total over 100% because of overlap.

Include the percent cover of snags (standing dead) of trees and shrubs. Use the code "SNAG." Note their species, if known, in the "Species" column (i.e. SNAG – *Quercus wislizeni*).

For Rapid Assessments, make sure that the major non-native species occurring in the stand also are listed in the space provided in the species list with their strata and % cover.

For Relevés, all native and non-native species should be included in the species list.

Unusual species: List species that are locally or regionally rare, endangered, or atypical (e.g., range extension or range limit) within the stand. This field will be useful to the Program for obtaining data on regionally or locally significant populations of plants.

Note: Field forms are generally filled out in pencil, so that changes may be made easily while working in the plot or stand. Once out of the stand, however, entries on the field form should not be erased, but should be crossed out and corrected in a different-colored ink.

Descriptions of Common Disturbance Codes (Site Impacts)

Site impacts include any anthropogenic disturbance having an effect on vegetation. These are the standard codes for plant, animal, and natural community surveys, used by the Natural Diversity Database of the California Natural Heritage Program. Descriptions are provided for impacts that are common and for which additional clarification seems warranted. Impacts are evaluated as Light, Moderate, or Heavy. Unless otherwise stated, definitions of these values are:

Light: less than 33% of the stand is impacted

Moderate: between 33% and 66% of the stand is impacted

Heavy: more than 66% of the stand is impacted

01 Development: Used to describe any construction or human modifications to the environment that are not otherwise specifically included on the Disturbance Codes list. These can include fencing, informal campsite construction, building sites, etc. (e.g., houses, oil rigging pads, pumping stations, power transmission towers, walls, etc.)

Light: less than 2% of the stand is impacted

Moderate: between 2% and 5% of the stand is impacted

Heavy: more than 5% of the stand is impacted

02 ORV activity: "Informal" roads and trails created by off-highway vehicle activity. See 15 Roads/trails for examples

04 Grazing: Refers to the grazing of domesticated animals, and not necessarily to the grazing activities of native wildlife. Exceptions can be made in cases where management practices have resulted in the overpopulation of native herbivores and destruction of native vegetation (may include browsing on woody vegetation as well as herbaceous vegetation). Levels are determined by density of recent livestock droppings, level of distinction of browse lines on shrubs (attributable to livestock), density and

extent of livestock trails, cover of livestock hoof-punch, and associated removal of vegetation cover from recent seasons.

05 Competition from exotics: Refers to implied competition for resources between native and introduced non-native plant species. The level of impact is determined by the proportion of the total cover occupied by exotic species compared to total cover of all species. Estimate total vegetation cover and total non-native cover then divide the latter by the former.

Light: less than 33% of total cover is non-native

Moderate: between 33% and 66% of total cover is non-native

Heavy: more than 66% of total cover is non-native

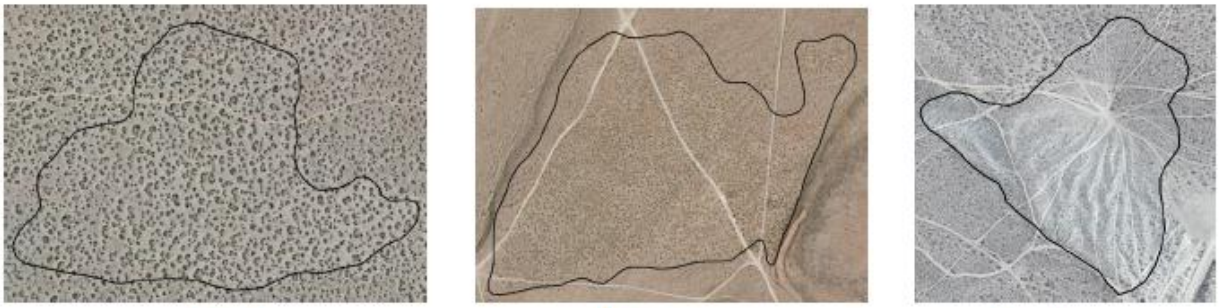
06 Logging: Refers to the large scale removal of tree biomass, usually in commercial operations. This impact should not be used to describe the localized felling of one or a few trees.

15 Road/trail construction/maint.: Includes all established roads and trails (dirt, gravel, paved) and their impact on any part of the sampled vegetation stand.

Light: less than 33% of the vegetation polygon area is affected by any type of road

Moderate: between 33% and 66% of the vegetation polygon is intersected by any type of road

Heavy: more than 66% of the vegetation polygon is affected by roads of any kind



Light Moderate Heavy

19 Vandalism/dumping/litter: Includes temporary degradable as well as more persistent trash and junk (for example, concrete or cement fragments not used as rip-rap, see below)

21 Improper burning regime: Should be used only in cases where repeated burning has caused significant changes to the vegetation OR in cases where the fire interval has been much longer than natural (causing shifts in vegetation or senescence). It does not necessarily apply to a recently burned stand, even if the fire was human-caused.

27 Wood cutting: Refers to the small scale cutting of firewood, or to the limited cutting of wood for other purposes, and not to large-scale commercial logging operations.

32 Rip-rap, bank protection: The treatment of slopes of dikes, banks of streams, lakes and other water bodies by placement of riprap (an engineered layer of graded broken rock pieces) to prevent erosion by surface runoff, stream flows and/or wave action.

36 Rills: Small, intermittent water courses with steep sides usually only a few centimeters deep. They occur most often on recently cultivated soils or on denuded surfaces.

37 Phytogenic mounding: Refers to the build-up of soil and debris at the base of shrubs or trees (normally seen in semi-arid environments), with a concomitant loss of surface material between the shrubs or trees.

38 Sudden Oak Death: A disease of oaks and other woody perennials caused by the plant pathogen *Phytophthora ramorum*. The most useful diagnostic symptom for *P. ramorum* is the development of cankers on the trunk. Cankers have red-brown to black discoloration and seep dark black to red or amber sap. They usually develop 1 to 2 m off of the ground, although they can be at soil level, or as high as 4 m or greater.

CODE LIST

GEOLOGY CODE

IGTU	**Igneous (type unknown)**
MIIG	Mixed igneous
ULTU	Ultramafic (type unknown)
VOLC	General volcanic extrusives
ANDE	Andesite
ASHT	Ash (of any origin)
BASA	Basalt
DIAB	Diabase
OBSI	Obsidian
PUMI	Pumice
PYFL	Pyroclastic flow
RHYO	Rhyolite
VOFL	Volcanic flow
VOMU	Volcanic mud
INTR	General igneous intrusives
DIOR	Diorite
GABB	Gabbro
GRAN	Granitic (generic)
MONZ	Monzonite
PERI	Peridotite
QUDI	Quartz diorite
METU	**Metamorphic (type unknown)**
MIME	Mixed metamorphic
GREE	Greenstone
BLUE	Blue schist
FRME	Franciscan melange
GNBG	Gneiss/biotite gneiss
HORN	Hornfels
MARB	Marble
PHYL	Phyllite
SCHI	Schist
SESC	Semi-schist
SLAT	Slate
ULTU	Ultramafic (type unknown)
SERP	Serpentine
SETU	**Sedimentary (type unknown)**
BREC	Breccia (non-volcanic)
CACO	Calcareous conglomerate
CALU	Calcareous (origin unknown)
CASA	Calcareous sandstone
CASH	Calcareous shale
CASI	Calcareous siltstone
CHER	Chert
CONG	Conglomerate
DOLO	Dolomite
FANG	Fanglomerate
LIME	Limestone
MISE	Mixed sedimentary
SAND	Sandstone
SHAL	Shale
SILT	Siltstone
CLAL	Clayey alluvium
DUNE	Sand dunes
GLTI	Glacial till, mixed origin, moraine
GRAL	Gravelly alluvium
LALA	Large landslide (unconsolidated)

GEOLOGY CODE, continued

LOSS	Loess
MIAL	Mixed alluvium
SAAL	Sandy alluvium
SIAL	Silty alluvium
MIRT	Mix of two or more rock types
OTHE	Other than on list

ROCK SIZE, measurement of longest dimension

Boulder	> 60 cm
Stone	25 cm to 60 cm
Cobble	7.5 cm to 25 cm
Gravel	2 mm to 7.5 cm
Fines	< 2 mm

DISTURBANCE CODES

01 Development
02 ORV activity
03 Agriculture
04 Grazing
05 Competition from exotics
06 Logging
07 Insufficient population/stand size
08 Altered flood/tidal regime
09 Mining
10 Hybridization
11 Groundwater pumping
12 Dam/inundation
13 Other
14 Surface water diversion
15 Road/trail construction/maint.
16 Biocides
17 Pollution
18 Unknown
19 Vandalism/dumping/litter
20 Foot traffic/trampling
21 Improper burning regime
22 Over collecting/poaching
23 Erosion/runoff
24 Altered thermal regime
25 Landfill
26 Degrading water quality
27 Wood cutting
28 Military operations
29 Recreational use (non ORV)
30 Nest parasitism
31 Non-native predators
32 Rip-rap, bank protection
33 Channelization (human caused)
34 Feral pigs
35 Burros
36 Rills
37 Phytogenic mounding
38 Sudden Oak Death

APPENDIX B. FIELD PERSONNEL AND INITIALS USED ON FIELD SURVEY FORMS AND IN DATABASE

Name	Initials	Organization
Alo Dodge	AD	CNPS
Amanda Gibbs	AMG	Wildscape Restoration
Ana Tobio	AT	CNPS
Andy Fredell	not abbreviated	PAX Environmental
Brant Primrose	not abbreviated	Althouse and Meade
Brian Clark	BCC	Althouse and Meade
Bryce King	BK	CNPS
Cole Schwab	CCS	Wildscape Restoration
David Magney	DLM	Althouse and Meade
Frankie Coburn	FSC	Althouse and Meade
Harrison McGowen	not abbreviated	Althouse and Meade
Ivett Plascencia	not abbreviated	PAX Environmental
Jenna Heaphy	JSH	Althouse and Meade
Julie Evens	JE	CNPS
Keenan Harris	KDH	Althouse and Meade
Keir Morse	KAM	Althouse and Meade
Kim Pivetti	KP	CNPS
Kimberly Dispenza	KD	CNPS
Kristen Andersen	KLA	Althouse and Meade
Laura Breidenthal	LB	CNPS
Lauryn Cabral	LBC	Althouse and Meade
Lyra Martin	LM	CNPS
Mary Ciambrone	MC	CNPS
Mary Logan	not abbreviated	Wildscape Restoration
Mike Heine	MH	CNPS
Neda Brehm	NB, MNB	Althouse and Meade
Nikki Gordon	not abbreviated	Althouse and Meade
Paul Excoffier	PE	CNPS
Rachel Wright	RAW	Althouse and Meade
Ruby Molinari	RJM	Althouse and Meade
Scott Tomkinson	not abbreviated	PAX Environmental
Sharon Estrada	SE	CNPS
Thomas McNamara	not abbreviated	PAX Environmental
Tom Reyes	TR	CNPS
Torrance Haynes	TH	CDFW
Zach Kinman	ZMK	Althouse and Meade

APPENDIX C. FIELD ALLIANCES SAMPLED

This appendix includes tables summarizing the field alliances sampled during the SMCV project and how confident the field alliance call was on each. Sensitive alliances (S1-S3) are noted with an asterisk. The alliances are divided into three tables based on dominant life form: trees (Table C-1), shrubs (Table C-2), and Herbs (Table C-3).

TABLE C-1. FIELD ALLIANCES (VEGETATION TYPES) FOR TREE STANDS WITH CONFIDENCE SURVEYED IN THE SCMV SURVEY AREA DURING THE 2024 AND 2025 FIELD SEASONS.

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Abies concolor	14	7	1	22
Abies concolor - Pinus lambertiana	8	3	0	11
Acer macrophyllum*	3	5	0	8
Alnus rhombifolia	32	5	2	39
Arbutus menziesii	2	0	0	2
Calocedrus decurrens*	12	3	0	15
Chilopsis linearis - Psorothamnus spinosus*	7	0	0	7
Eucalyptus spp. - Ailanthus altissima - Robinia pseudoacacia	3	0	1	4
Hesperocyparis forbesii - Hesperocyparis nevadensis*	1	0	0	1
Hesperocyparis macrocarpa - Pinus radiata	2	1	0	3
Hesperocyparis stephensonii	1	1	0	2
Juglans californica*	13	2	0	15
Juniperus californica	3	1	0	4
Juniperus grandis	1	0	1	2
Notholithocarpus densiflorus*	4	2	0	6

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Parkinsonia florida - Olneya tesota	0	1	0	1
Phoenix dactylifera - Washingtonia filifera	0	1	0	1
Pinus contorta ssp. murrayana	6	2	0	8
Pinus coulteri	20	2	0	22
Pinus flexilis*	3	1	0	4
Pinus jeffreyi	38	12	3	53
Pinus lambertiana*	1	2	0	3
Pinus monophylla - (Juniperus osteosperma)	32	4	1	37
Pinus muricata - Pinus radiata*	5	0	0	5
Pinus ponderosa	2	2	1	5
Pinus ponderosa - Calocedrus decurrens - Pseudotsuga menziesii	1	2	0	3
Pinus sabiniana	3	2	2	7
Platanus racemosa - Quercus agrifolia*	36	6	2	44
Populus fremontii - Fraxinus velutina - Salix gooddingii*	19	4	2	25
Populus tremuloides*	1	0	0	1
Populus trichocarpa*	4	1	0	5
Prosopis glandulosa - Prosopis velutina - Prosopis pubescens*	5	0	0	5
Pseudotsuga macrocarpa*	20	1	0	21

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Pseudotsuga menziesii - Calocedrus decurrens*	0	0	1	1
Quercus agrifolia	39	7	5	51
Quercus chrysolepis (tree)	37	4	3	44
Quercus douglasii	6	1	0	7
Quercus engelmannii*	5	1	0	6
Quercus kelloggii	21	6	1	28
Quercus lobata*	1	1	0	2
Quercus lobata Riparian*	2	0	0	2
Quercus wislizeni - Quercus parvula (tree)	3	0	0	3
Salix gooddingii - Salix laevigata*	21	1	0	22
Salix lucida ssp. lasiandra*	2	1	0	3
Schinus (molle, terebinthifolius) - Myoporum laetum	0	1	0	1
Umbellularia californica*	14	1	0	15
Washingtonia filifera*	3	1	0	4
Yucca brevifolia*	4	1	1	6

*Denotes sensitive communities as defined by CDFW

TABLE C-2. FIELD ALLIANCES (VEGETATION TYPES) FOR SHRUB STANDS WITH CONFIDENCE SURVEYED IN THE SCMV SURVEY AREA DURING THE 2024 AND 2025 FIELD SEASONS.

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Acacia spp. - Grevillea spp. - Leptospermum laevigatum	1	0	0	1
Adenostoma fasciculatum	45	11	1	57
Adenostoma fasciculatum - Salvia spp.	7	0	1	8
Adenostoma sparsifolium	10	1	0	11
Agave deserti*	1	1	0	2
Ambrosia dumosa	1	0	1	2
Ambrosia salsola - Bebbia juncea	1	0	0	1
Amelanchier utahensis - Cercocarpus montanus - Cercocarpus intricatus*	4	0	0	4
Arctostaphylos (purissima, rudis)*	23	2	2	27
Arctostaphylos glandulosa	24	3	0	27
Arctostaphylos glauca	20	2	1	23
Arctostaphylos patula - Arctostaphylos nevadensis	3	0	2	5
Arctostaphylos pungens - Arctostaphylos pringlei	7	7	1	15
Artemisia californica - (Salvia leucophylla)	45	1	3	49
Artemisia nova*	0	0	2	2
Artemisia rothrockii*	4	1	0	5
Artemisia tridentata	13	1	3	17

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Artemisia tridentata ssp. vaseyana	0	6	2	8
Atriplex canescens	2	1	0	3
Atriplex lentiformis	6	0	1	7
Baccharis emoryi - Baccharis sergiloides	4	0	0	4
Baccharis pilularis	20	7	0	27
Baccharis salicifolia	12	2	0	14
Ceanothus (oliganthus, tomentosus)*	9	2	1	12
Ceanothus cordulatus - Ceanothus integerrimus	12	3	0	15
Ceanothus crassifolius	19	3	4	26
Ceanothus cuneatus	10	3	1	14
Ceanothus greggii - Fremontodendron californicum*	13	4	1	18
Ceanothus leucodermis	13	3	0	16
Ceanothus megacarpus	10	1	0	11
Ceanothus oliganthus - Ceanothus leucodermis - Ceanothus tomentosus [pending]	1	0	0	1
Ceanothus papillosus*	1	0	0	1
Ceanothus thyrsiflorus	5	0	0	5
Cercocarpus ledifolius	4	1	0	5
Cercocarpus montanus	21	7	2	30
Chrysolepis sempervirens*	3	0	0	3

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Chrysothamnus viscidiflorus	2	1	0	3
Coleogyne ramosissima	5	1	0	6
Coreopsis gigantea*	7	1	2	10
Cornus sericea - Rosa woodsii - Ribes spp.*	0	1	0	1
Cylindropuntia bigelovii	2	0	0	2
Cytisus scoparius - Genista monspessulana - Cotoneaster spp.	2	0	0	2
Diplacus aurantiacus*	5	2	1	8
Encelia (actonii, virginensis) - Viguiera reticulata*	2	0	0	2
Encelia californica - Eriogonum cinereum*	7	2	0	9
Encelia farinosa	8	2	1	11
Ephedra californica - Ephedra trifurca	3	0	0	3
Ephedra nevadensis - Lycium andersonii - Grayia spinosa*	4	1	0	5
Ephedra viridis	0	2	0	2
Ericameria linearifolia - Cleome isomeris	4	1	0	5
Ericameria nauseosa	10	1	1	12
Eriogonum fasciculatum	37	7	3	47
Eriogonum fasciculatum - Salvia apiana	8	2	2	12
Eriogonum spp. / Poa secunda*	0	1	0	1

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis*	19	6	1	26
Frangula californica - Rhododendron occidentale - Salix breweri*	1	1	1	3
Gutierrezia sarothrae - Gutierrezia microcephala*	2	1	0	3
Hazardia squarrosa*	2	0	1	3
Isocoma menziesii*	5	0	0	5
Krascheninnikovia lanata*	1	0	0	1
Larrea tridentata	2	1	0	3
Larrea tridentata - Ambrosia dumosa	1	1	0	2
Larrea tridentata - Encelia farinosa	1	0	0	1
Lepidospartum squamatum*	19	3	2	24
Lotus scoparius - Lupinus albifrons - Eriodictyon spp.	21	10	6	37
Lupinus arboreus	1	0	0	1
Lupinus chamissonis - Ericameria ericoides*	19	1	2	22
Malacothamnus fasciculatus - Malacothamnus spp.	12	2	2	16
Malosma laurina	15	9	4	28
Opuntia littoralis - Opuntia oricola - Cylindropuntia prolifera*	7	1	0	8
Other - Arctostaphylos refugioensis	0	2	1	3

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Other - Ceanothus impressus	0	0	3	3
Other - Ceanothus palmeri	4	1	1	6
Other - Ericameria arborescens	0	0	1	1
Other - Ericameria brachylepis/Cylindropuntia spp.	0	0	1	1
Other - Eriogonum kennedyi	8	3	0	11
Other - Fraxinus dipetala	0	2	6	8
Other - Quercus cornelius-mulleri x Q. engelmannii (Quercus x acutidens) - see site history	1	0	0	1
Other - Rhamnus crocea	0	0	1	1
Other - Vaccinium ovatum	0	0	1	1
Pluchea sericea*	2	0	0	2
Prunus emarginata - Holodiscus discolor	3	1	0	4
Prunus fasciculata - Salazaria mexicana	7	1	0	8
Prunus ilicifolia - Heteromeles arbutifolia - Ceanothus spinosus	34	6	4	44
Prunus virginiana	5	4	0	9
Psorothamnus fremontii - Psorothamnus polydenius*	1	0	0	1
Purshia tridentata - Artemisia tridentata	1	0	0	1
Quercus berberidifolia	23	8	2	33
Quercus cornelius-mulleri	6	4	2	12

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Quercus dumosa - Quercus pacifica	2	0	0	2
Quercus durata	8	3	0	11
Quercus garryana (shrub)	1	0	0	1
Quercus john-tuckeri	11	4	0	15
Quercus wislizeni - Quercus chrysolepis (shrub)*	23	7	8	38
Rhus integrifolia*	12	0	0	12
Rhus ovata	4	1	1	6
Rhus trilobata - Crataegus rivularis - Forestiera pubescens*	8	2	0	10
Ribes quercetorum - Rhus trilobata - Frangula californica	1	0	1	2
Rosa californica*	10	0	1	11
Rubus armeniacus - Sesbania punicea - Ficus carica	2	0	0	2
Salix exigua	8	0	0	8
Salix lasiolepis	26	4	2	32
Salix lemmonii*	2	1	0	3
Salix scouleriana [pending]	1	0	0	1
Salvia apiana*	16	4	0	20
Salvia mellifera - (Artemisia californica)*	19	8	2	29
Senegalia greggii - Hyptis emoryi - Justicia californica	6	0	0	6
Simmondsia chinensis*	0	1	0	1

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Suaeda mosquinii*	1	1	0	2
Tamarix spp.	2	0	0	2
Toxicodendron diversilobum	9	0	0	9
Vitis arizonica - Vitis girdiana*	1	0	0	1
Xylococcus bicolor*	4	1	0	5
Yucca schidigera	3	1	0	4

*Denotes sensitive communities as defined by CDFW

TABLE C-3. FIELD ALLIANCES (VEGETATION TYPES) FOR HERBACEOUS STANDS WITH CONFIDENCE SURVEYED IN THE SCMV SURVEY AREA DURING THE 2024 AND 2025 FIELD SEASONS.

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Abronia latifolia - Ambrosia chamissonis	9	1	2	12
Achnatherum speciosum	4	0	0	4
Agastache urticifolia - Geranium viscosissimum - Pteridium aquilinum	2	1	3	6
Allium spp. - Streptanthus spp. - Hesperolinon spp. Serpentinite	0	0	1	1
Ambrosia psilostachya	5	1	0	6
Ammophila arenaria	7	0	0	7
Amsinckia (menziesii, tessellata) - Phacelia spp.	6	3	10	19
Anemopsis californica - Helianthus nuttallii - Solidago spectabilis	2	3	0	5
Aristida purpurea - Elymus elymoides - Poa secunda	1	0	0	1
Artemisia dracunculus	4	1	0	5
Arthrocnemum subterminale	3	0	0	3
Atriplex prostrata - Cotula coronopifolia	1	0	0	1
Avena spp. - Bromus spp.	13	4	1	18
Bidens cernua - Euthamia occidentalis - Ludwigia palustris	2	2	1	5
Bolboschoenus maritimus	4	0	0	4

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Brassica nigra - Centaurea (solstitialis, melitensis)	11	2	1	14
Bromus carinatus - Elymus glaucus	2	0	0	2
Bromus rubens - Schismus (arabicus, barbatus)	1	0	0	1
Bromus tectorum - Taeniatherum caput-medusae	3	1	0	4
Cakile (edentula, maritima)	4	0	0	4
Carex obnupta - Oenanthe sarmentosa - Scirpus microcarpus	0	0	1	1
Carex utriculata - Calamagrostis canadensis	6	0	1	7
Centromadia (pungens)	1	0	0	1
Cistanthe (umbellata) - Gayophytum (diffusum)	1	0	0	1
Conium maculatum - Foeniculum vulgare	2	0	0	2
Corethrogyne filaginifolia - Eriogonum (elongatum, nudum)	7	4	2	13
Cortaderia (jubata, selloana)	1	0	0	1
Cressa truxillensis - Distichlis spicata	2	0	1	3
Cynodon dactylon - Crypsis spp. - Paspalum spp.	3	0	0	3
Danthonia californica - Deschampsia cespitosa - Camassia quamash	3	1	0	4

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Deinandra fasciculata	2	0	0	2
Distichlis spicata - (Juncus cooperi - Frankenia salina) Interior	4	0	1	5
Distichlis spicata - Frankenia salina Coastal	9	1	3	13
Dudleya cymosa - Dudleya lanceolata / Lichen - Moss	1	3	2	6
Eleocharis (palustris, rostellata) Alkaline-Saline	2	0	1	3
Equisetum (arvense, variegatum, hyemale)	0	2	1	3
Eriophyllum staechadifolium - Erigeron glaucus - Eriogonum latifolium	2	4	3	9
Eschscholzia (californica) - Lupinus (nanus)	7	2	2	11
Heterotheca (oregona, sessiliflora)	1	3	0	4
Holcus lanatus - Anthoxanthum odoratum	1	0	0	1
Hydrilla verticillata - Myriophyllum spicatum	1	0	0	1
Iris missouriensis	2	3	0	5
Juncus (effusus, patens) - Carex (pansa, praegracilis)	16	4	8	28
Juncus (oxymeris, xiphioides)	2	0	2	4
Juncus arcticus (var. balticus, mexicanus)	15	2	1	18

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Lasthenia californica - Plantago erecta - Vulpia microstachys	7	5	2	14
Lasthenia fremontii - Downingia (bicornuta)	0	0	1	1
Lasthenia glaberrima - Eleocharis macrostachya	7	2	1	10
Lemna (minor) and Relatives	2	0	0	2
Lepidium latifolium - Lactuca serriola	1	0	0	1
Leymus cinereus - Leymus triticoides	8	1	3	12
Leymus condensatus	5	0	0	5
Lolium perenne	1	0	0	1
Lotus unifoliolatus	2	1	0	3
Ludwigia (hexapetala, peploides) - Eichhornia crassipes	3	0	0	3
Mesembryanthemum spp. - Carpobrotus spp.	4	1	3	8
Mimulus guttatus - Cirsium spp. - Stachys spp.	3	3	4	10
Monolopia (lanceolata) - Coreopsis (calliopsidea)	1	0	0	1
Muhlenbergia rigens	10	1	0	11
Nassella spp. - Melica spp.	13	0	0	13
Other - Acmispon wrangelianus	0	0	1	1
Other - Agrostis scabra	0	0	1	1

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Other - Agrostis scabra, Lupinus lepidus, Carex subfusca, and/or Potentilla biennis	0	0	1	1
Other - Artemisia ludoviciana	0	1	2	3
Other - Asphodelus fistulosus	0	1	0	1
Other - Calandrinia menziesii	0	0	1	1
Other - Calochortus catalinae post-fire stand	0	1	0	1
Other - Carex (occidentalis)	0	0	1	1
Other - Carex pellita	1	0	1	2
Other - Carex schottii	3	0	2	5
Other - Carex senta	0	2	3	5
Other - Carex subfusca	2	0	1	3
Other - Croton californicus or sandy herbland	1	2	3	6
Other - Deinandra increscens	0	2	0	2
Other - Deschampsia danthonioides	0	0	2	2
Other - Ehrharta calycina	4	4	0	8
Other - Elymus trachycaulus	0	0	1	1
Other - Epilobium campestre	0	0	3	3
Other - Epilobium campestre and/or Psilocarphus brevissimus var. brevissimus	0	0	1	1
Other - Epilobium canum	0	1	0	1
Other - Eriastrum densifolium	0	0	1	1

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Other - Festuca myuros and Melilotus indicus	0	0	1	1
Other - Geranium californicum and/or Artemisia ludoviciana based alliance	0	0	1	1
Other - Gilia angelensis	0	0	1	1
Other - Heliotropium curassavicum	0	1	2	3
Other - Hordeum jubatum	1	1	2	4
Other - Horkelia rydbergii	0	0	2	2
Other - Juncus textilis	0	0	3	3
Other - Lessingia tenuis	0	0	3	3
Other - Limosella acaulis	0	0	1	1
Other - Madia elegans	0	0	1	1
Other - Malacothrix saxatilis	0	0	1	1
Other - Native disturbance-following forbland or Nicotiana spp. alliance?	0	0	1	1
Other - Oenothera avita ssp. avita	0	0	1	1
Other - Plantago coronopus	0	0	1	1
Other - Plantago lanceolata	0	0	1	1
Other - Platystemon californica dominant with other spring flowering herbs, see notes	0	0	1	1
Other - Polypodium californicum	0	0	1	1
Other - Rock outcrop vegetation	0	1	2	3

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Other - Salvia spathacea	1	0	1	2
Other - Scree forbland	0	1	8	9
Other - Serpentine or scree forbland	0	0	1	1
Other - Suaeda calceoliformis	1	1	0	2
Other - Trifolium microcephalum	0	0	2	2
Oxypolis occidentalis	0	1	0	1
Pennisetum setaceum - Pennisetum ciliare	5	0	0	5
Phalaris aquatica - Phalaris arundinacea	5	3	0	8
Phragmites australis - Arundo donax	1	3	0	4
Plagiobothrys nothofulvus	0	0	1	1
Poa pratensis - Agrostis gigantea - Agrostis stolonifera	1	0	0	1
Poa secunda - Muhlenbergia richardsonis - Carex douglasii	4	2	0	6
Polygonum lapathifolium - Xanthium strumarium	2	1	1	4
Ruppia (cirrhosa, maritima)	2	0	0	2
Sarcocornia pacifica (Salicornia depressa)	7	4	1	12
Schoenoplectus (acutus, californicus)	9	0	0	9
Schoenoplectus americanus	2	1	0	3
Scirpus microcarpus	1	1	0	2

Field Alliance	High Confidence	Medium Confidence	Low Confidence	Grand Total
Selaginella (bigelovii, wallacei)	7	5	2	14
Senecio triangularis - Veratrum californicum - Mimulus spp.	2	1	2	5
Spartina foliosa	2	0	0	2
Sphaeralcea (ambigua, coccinea, parvifolia)	0	0	1	1
Sporobolus airoides - Muhlenbergia asperifolia - Spartina gracilis	1	0	0	1
Stuckenia (pectinata) - Potamogeton spp.	3	1	0	4
Typha (angustifolia, domingensis, latifolia)	8	1	0	9

*Denotes sensitive communities as defined by CDFW

APPENDIX D. RARE PLANT TAXA DOCUMENTED DURING SURVEYS AND ALLIANCES THEY OCCUR IN

All rare plant taxa documented in SCMV surveys are shown below with their CRPR, which field alliances they were documented within, the total number of stands they were documented in, and the number of stands they were documented in within each alliance. Taxa with voucher specimens submitted to the Jepson Herbarium are denoted with an asterisk.

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
****Abronia maritima* - CRPR 4.2**	**13**
Abronia latifolia - Ambrosia chamissonis	6
Ammophila arenaria	2
Atriplex lentiformis	1
Cakile (edentula, maritima)	1
Eriophyllum staechadifolium - Erigeron glaucus - Eriogonum latifolium	1
Lupinus chamissonis - Ericameria ericoides	1
Mesembryanthemum spp. - Carpobrotus spp.	1
****Acanthomintha obovata* ssp. *cordata* - CRPR 4.2**	**3**
Amsinckia (menziesii, tessellata) - Phacelia spp.	1
Ericameria nauseosa	1
Monolopia (lanceolata) - Coreopsis (calliopsidea)	1
****Acanthoscyphus parishii* var. *parishii* - CRPR 4.2**	**1**
Abies concolor - Pinus lambertiana	1
****Agrostis hooveri* - CRPR 1B.2**	**1**
Quercus agrifolia	1
****Allium howellii* var. *clokeyi* - CRPR 1B.3**	**4**
Amsinckia (menziesii, tessellata) - Phacelia spp.	1
Aristida purpurea - Elymus elymoides - Poa secunda	1
Ericameria nauseosa	1
Quercus john-tuckeri	1
***Amsinckia douglasiana* - CRPR 4.2**	**1**
Amsinckia (menziesii, tessellata) - Phacelia spp.	1
***Androsace elongata* ssp. *acuta* - CRPR 4.2**	**2**
Other - Eriogonum kennedyi	2

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Aphyllon epigalium* ssp. *notocalifornicum* - CRPR 1B.3**	**1**
Quercus chrysolepis (tree)	1
***Aphyllon validum* ssp. *validum* - CRPR 1B.2**	**1**
Quercus durata	1
***Arctostaphylos otayensis* - CRPR 1B.2**	**1**
Hesperocyparis forbesii - Hesperocyparis nevadensis	1
***Arctostaphylos parryana* ssp. *tumescens* - CRPR 4.3**	**2**
Arctostaphylos pungens - Arctostaphylos pringlei	1
Quercus wislizeni - Quercus chrysolepis (shrub)	1
***Arctostaphylos purissima* - CRPR 1B.1**	**37**
Adenostoma fasciculatum	3
Adenostoma fasciculatum - Salvia spp.	1
Arctostaphylos (purissima, rudis)	20
Ceanothus crassifolius	1
Hesperocyparis macrocarpa - Pinus radiata	1
Other - Ceanothus impressus	2
Pinus muricata - Pinus radiata	3
Prunus ilicifolia - Heteromeles arbutifolia - Ceanothus spinosus	1
Quercus agrifolia	3
Quercus wislizeni - Quercus chrysolepis (shrub)	2
***Arctostaphylos refugioensis* - CRPR 1B.2**	**4**
Adenostoma fasciculatum	1
Other - Arctostaphylos refugioensis	2
Other - Arctostaphylos refugioensis with Adenostoma fasciculatum alliance	1
***Arctostaphylos rudis* - CRPR 1B.1**	**23**
Adenostoma fasciculatum	1
Arctostaphylos (purissima, rudis)	13
Ceanothus cuneatus	1
Cercocarpus montanus	1
Other - Ceanothus impressus	1
Other - Ehrharta calycina	1
Quercus agrifolia	4
Quercus wislizeni - Quercus chrysolepis (shrub)	1

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Astragalus albens* - CRPR 1B.1**	**2**
Malacothamnus fasciculatus - Malacothamnus spp.	1
Pinus monophylla - (Juniperus osteosperma)	1
***Astragalus bicristatus* - CRPR 4.3**	**1**
Juniperus grandis	1
***Astragalus douglasii* var. *perstrictus* - CRPR 1B.2**	**1**
Artemisia tridentata	1
***Astragalus lentiginosus* var. *sierrae* - CRPR 1B.2**	**1**
Leymus cinereus - Leymus triticoides	1
***Astragalus leucolobus* - CRPR 1B.2**	**4**
Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis	1
Other - Eriogonum kennedyi	1
Prunus fasciculata - Salazaria mexicana	1
Sphaeralcea (ambigua, coccinea, parvifolia)	1
***Astragalus nuttallii* var. *nuttallii* - CRPR 4.3**	**4**
Coreopsis gigantea	2
Lupinus chamissonis - Ericameria ericoides	1
Mesembryanthemum spp. - Carpobrotus spp.	1
***Astragalus oocarpus* - CRPR 1B.2**	**2**
Agastache urticifolia - Geranium viscosissimum - Pteridium aquilinum	1
Quercus engelmannii	1
***Baccharis plummerae* ssp. *plummerae* - CRPR 4.3**	**17**
Acer macrophyllum	2
Arctostaphylos glandulosa	2
Ceanothus (oliganthus, tomentosus)	1
Juglans californica	1
Malosma laurina	1
Other - Fraxinus dipetala	1
Prunus ilicifolia - Heteromeles arbutifolia - Ceanothus spinosus	3
Quercus agrifolia	1
Quercus berberidifolia	1
Quercus chrysolepis (tree)	2
Umbellularia californica	2

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Berberis nevinii* - CRPR 1B.1**	**1**
Platanus racemosa - Quercus agrifolia	1
***Boechera parishii* - CRPR 1B.2**	**7**
Other - Eriogonum kennedyi	7
****Brodiaea orcuttii* - CRPR 1B.1**	**2**
Ambrosia psilostachya	1
Quercus agrifolia	1
****Calochortus clavatus* var. *clavatus* - CRPR 4.3**	**5**
Artemisia californica - (Salvia leucophylla)	2
Ceanothus cuneatus	1
Deinandra fasciculata	1
Salvia apiana	1
***Calochortus fimbriatus* - CRPR 1B.3**	**3**
Adenostoma fasciculatum	1
Adenostoma fasciculatum - Salvia spp.	1
Other - Ericameria arborescens	1
***Calochortus palmeri* var. *palmeri* - CRPR 1B.2**	**1**
Platanus racemosa - Quercus agrifolia	1
***Calochortus plummerae* - CRPR 4.2**	**7**
Adenostoma fasciculatum	2
Cercocarpus montanus	2
Eriogonum fasciculatum	1
Eriogonum fasciculatum - Salvia apiana	1
Selaginella (bigelovii, wallacei)	1
***Calochortus weedii* var. *intermedius* - CRPR 1B.2**	**1**
Lotus scoparius - Lupinus albifrons - Eriodictyon spp.	1

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Calystegia collina* ssp. *venusta* - CRPR 4.3**	**6**
Arctostaphylos glauca	1
Eriogonum fasciculatum	1
Lasthenia californica - Plantago erecta - Vulpia microstachys	1
Nassella spp. - Melica spp.	1
Other - Calochortus catalinae post-fire stand	1
Pinus sabiniana	1
***Calystegia peirsonii* - CRPR 4.2**	**3**
Adenostoma fasciculatum	1
Ceanothus cuneatus	1
Malacothamnus fasciculatus - Malacothamnus spp.	1
***Carex occidentalis* - CRPR 2B.3**	**2**
Leymus cinereus - Leymus triticoides	1
Mimulus guttatus - Cirsium spp. - Stachys spp.	1
***Castilleja cinerea* - CRPR 1B.2**	**7**
Artemisia rothrockii	1
Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis	2
Other - Eriogonum kennedyi	4
***Castilleja latifolia* - CRPR 4.3**	**2**
Baccharis pilularis	1
Diplacus aurantiacus	1
****Castilleja plagiotoma* - CRPR 4.3**	**2**
Ericameria nauseosa	1
Prunus fasciculata - Salazaria mexicana	1
***Caulanthus amplexicaulis* var. *barbarae* - CRPR 1B.1**	**1**
Other - Scree forbland	1
***Ceanothus cuneatus* var. *fascicularis* - CRPR 4.2**	**8**
Arctostaphylos (purissima, rudis)	3
Prunus ilicifolia - Heteromeles arbutifolia - Ceanothus spinosus	1
Quercus agrifolia	2
Quercus wislizeni - Quercus chrysolepis (shrub)	2

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Ceanothus foliosus* var. *viejasensis* - CRPR 1B.2**	**1**
Lotus scoparius - Lupinus albifrons - Eriodictyon spp.	1
***Ceanothus impressus* var. *impressus* - CRPR 1B.2**	**19**
Arctostaphylos (purissima, rudis)	9
Ceanothus crassifolius	1
Ceanothus thyrsiflorus	1
Lupinus chamissonis - Ericameria ericoides	1
Other - Ceanothus impressus	2
Pinus muricata - Pinus radiata	3
Quercus agrifolia	1
Quercus wislizeni - Quercus chrysolepis (shrub)	1
***Centromadia parryi* ssp. *australis* - CRPR 1B.1**	**1**
Centromadia (pungens)	1
***Cercocarpus betuloides* var. *blancheae* - CRPR 4.3**	**1**
Ceanothus megacarpus	1
***Chorizanthe leptotheca* - CRPR 4.2**	**1**
Ceanothus greggii - Fremontodendron californicum	1
***Chorizanthe polygonoides* var. *longispina* - CRPR 1B.2**	**1**
Gutierrezia sarothrae - Gutierrezia microcephala	1
***Cirsium rhothophilum* - CRPR 1B.2**	**2**
Abronia latifolia - Ambrosia chamissonis	1
Eriophyllum staechadifolium - Erigeron glaucus - Eriogonum latifolium	1
***Clinopodium chandleri* - CRPR 1B.2**	**3**
Other - Fraxinus dipetala	1
Quercus agrifolia	2
***Cordylanthus rigidus* ssp. *littoralis* - CRPR 1B.1**	**1**
Quercus agrifolia	1
***Cylindropuntia wolfii* - CRPR 4.3**	**1**
Other - Ericameria brachylepis/Cylindropuntia spp.	1

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Deinandra paniculata* - CRPR 4.2**	**3**
Adenostoma fasciculatum	1
Artemisia californica - (Salvia leucophylla)	1
Other - Croton californicus - Mucronea californica	1
****Delphinium parryi* ssp. *purpureum* - CRPR 4.3**	**1**
Ceanothus greggii - Fremontodendron californicum	1
***Delphinium umbraculorum* - CRPR 1B.3**	**1**
Plagiobothrys nothofulvus	1
***Dieteria asteroides* var. *lagunensis* - CRPR 2B.1**	**1**
Pinus coulteri	1
***Dieteria canescens* var. *ziegleri* - CRPR 1B.2**	**1**
Abies concolor - Pinus lambertiana	1
****Diplacus clevelandii* - CRPR 4.2**	**1**
Arctostaphylos glandulosa	1
****Diplacus johnstonii* - CRPR 4.3**	**9**
Corethrogyne filaginifolia - Eriogonum (elongatum, nudum)	1
Lotus scoparius - Lupinus albifrons - Eriodictyon spp.	1
Other - Scree forbland	6
Pinus coulteri	1
***Distichlis littoralis* - CRPR 4.2**	**2**
Sarcocornia pacifica (Salicornia depressa)	2
***Dudleya abramsii* ssp. *affinis* - CRPR 1B.2**	**5**
Other - Eriogonum kennedyi	5
***Dudleya multicaulis* - CRPR 1B.2**	**1**
Dudleya cymosa - Dudleya lanceolata / Lichen - Moss	1
***Eremogone ursina* - CRPR 1B.2**	**5**
Other - Eriogonum kennedyi	5
***Ericameria cuneata* var. *macrocephala* - CRPR 1B.3**	**1**
Eriogonum fasciculatum	1

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Erigeron parishii* - CRPR 1B.1**	**1**
Eriogonum fasciculatum	1
***Erigeron sanctarum* - CRPR 4.2**	**1**
Adenostoma fasciculatum	1
***Eriogonum evanidum* - CRPR 1B.1**	**1**
Artemisia rothrockii	1
***Eriogonum kennedyi* var. *austromontanum* - CRPR 1B.2**	**3**
Other - Eriogonum kennedyi	3
***Eriogonum umbellatum* var. *minus* - CRPR 4.3**	**1**
Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis	1
****Frasera neglecta* - CRPR 4.3**	**5**
Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis	1
Pinus jeffreyi	4
***Fritillaria pinetorum* - CRPR 4.3**	**1**
Chrysothamnus viscidiflorus	1
***Galium angustifolium* ssp. *gabrielense* - CRPR 4.3**	**1**
Abies concolor - Pinus lambertiana	1
****Galium cliftonsmithii* - CRPR 4.3**	**3**
Ceanothus (oliganthus, tomentosus)	1
Other - Arctostaphylos refugioensis	1
Umbellularia californica	1
***Galium johnstonii* - CRPR 4.3**	**1**
Pseudotsuga macrocarpa	1
***Geraea viscida* - CRPR 2B.2**	**1**
Quercus cornelius-mulleri	1
****Grindelia hallii* - CRPR 1B.2**	**4**
Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis	2
Juncus (oxymeris, xiphioides)	1
Pinus coulteri	1

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Hesperocyparis forbesii* - CRPR 1B.1**	**4**
Ceanothus greggii - Fremontodendron californicum	1
Hesperocyparis forbesii - Hesperocyparis nevadensis	3
***Hesperocyparis macrocarpa* - CRPR 1B.2**	**9**
Baccharis pilularis	1
Encelia californica - Eriogonum cinereum	1
Eucalyptus spp. - Ailanthus altissima - Robinia pseudoacacia	2
Hesperocyparis macrocarpa - Pinus radiata	5
***Hesperocyparis stephensonii* - CRPR 1B.1**	**5**
Hesperocyparis stephensonii	5
***Heuchera hirsutissima* - CRPR 1B.3**	**1**
Abies concolor - Pinus lambertiana	1
****Heuchera parishii* - CRPR 1B.3**	**3**
Mimulus guttatus - Cirsium spp. - Stachys spp.	1
Quercus kelloggii	1
Selaginella (bigelovii, wallacei)	1
***Holocarpha virgata* ssp. *elongata* - CRPR 4.2**	**1**
Artemisia tridentata	1
***Horkelia yadonii* - CRPR 4.2**	**1**
Other - Carex subfusca	1
***Ivesia argyrocoma* var. *argyrocoma* - CRPR 1B.2**	**5**
Other - Eriogonum kennedyi	5

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
****Juglans californica* - CRPR 4.2**	**74**
Artemisia californica - (Salvia leucophylla)	3
Baccharis pilularis	1
Ceanothus cuneatus	2
Ceanothus leucodermis	1
Hazardia squarrosa	1
Juglans californica	32
Malosma laurina	2
Opuntia littoralis - Opuntia oricola - Cylindropuntia prolifera	1
Other - Fraxinus dipetala	1
Platanus racemosa - Quercus agrifolia	10
Populus trichocarpa	1
Quercus agrifolia	3
Quercus lobata	1
Quercus lobata Riparian	1
Rhus integrifolia	2
Salix gooddingii - Salix laevigata	6
Salix lasiolepis	2
Salvia apiana	1
Toxicodendron diversilobum	2
Umbellularia californica	1
****Juncus acutus* ssp. *leopoldii* - CRPR 4.2**	**5**
Baccharis salicifolia	1
Juncus (effusus, patens) - Carex (pansa, praegracilis)	1
Populus fremontii - Fraxinus velutina - Salix gooddingii	1
Sporobolus airoides - Muhlenbergia asperifolia - Spartina gracilis	1
Typha (angustifolia, domingensis, latifolia)	1
***Keckiella rothrockii* var. *jacintensis* - CRPR 1B.3**	**5**
Abies concolor	2
Ceanothus cordulatus - Ceanothus integerrimus	1
Pinus contorta ssp. murrayana	1
Pinus jeffreyi	1
****Layia heterotricha* - CRPR 1B.1**	**4**
Amsinckia (menziesii, tessellata) - Phacelia spp.	1
Ericameria nauseosa	3

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Lessingia tenuis* - CRPR 4.3**	**8**
Artemisia nova	2
Ceanothus greggii - Fremontodendron californicum	1
Other - Horkelia rydbergii - Sidalcea sparsifolia ephemeral drainage forbland?	1
Other - Lessingia tenuis	3
Pinus jeffreyi	1
***Lilium humboldtii* ssp. *ocellatum* - CRPR 4.2**	**6**
Ceanothus (oliganthus, tomentosus)	1
Pseudotsuga macrocarpa	2
Quercus agrifolia	1
Umbellularia californica	2
***Lilium parryi* - CRPR 1B.2**	**4**
Abies concolor	1
Agastache urticifolia - Geranium viscosissimum - Pteridium aquilinum	1
Calocedrus decurrens	1
Other - Carex senta	1
***Linanthus californicus* ssp. *tomentosus* - CRPR 4.2**	**1**
Quercus agrifolia	1
***Linanthus concinnus* - CRPR 1B.2**	**1**
Other - Scree forbland	1
***Linanthus killipii* - CRPR 1B.2**	**1**
Other - Eriogonum kennedyi	1
***Linanthus orcuttii* - CRPR 1B.3**	**1**
Ceanothus greggii - Fremontodendron californicum	1
***Lonicera subspicata* var. *subspicata* - CRPR 1B.2**	**8**
Arctostaphylos pungens - Arctostaphylos pringlei	1
Ceanothus (oliganthus, tomentosus)	1
Ceanothus megacarpus	1
Malosma laurina	1
Prunus ilicifolia - Heteromeles arbutifolia - Ceanothus spinosus	2
Quercus agrifolia	1
Umbellularia californica	1

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Lupinus elatus* - CRPR 4.3**	**8**
Abies concolor	1
Abies concolor - Pinus lambertiana	2
Ceanothus cordulatus - Ceanothus integerrimus	1
Cercocarpus ledifolius	1
Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis	2
Pinus jeffreyi	1
***Malacothamnus davidsonii* - CRPR 1B.2**	**2**
Malacothamnus fasciculatus - Malacothamnus spp.	1
Malosma laurina	1
***Malacothamnus marrubioides* - CRPR 4.2**	**1**
Ericameria nauseosa	1
***Malacothrix incana* - CRPR 4.3**	**4**
Abronia latifolia - Ambrosia chamissonis	3
Mesembryanthemum spp. - Carpobrotus spp.	1
***Malacothrix saxatilis* var. *saxatilis* - CRPR 4.2**	**9**
Abronia latifolia - Ambrosia chamissonis	1
Atriplex lentiformis	1
Distichlis spicata - Frankenia salina Coastal	3
Encelia californica - Eriogonum cinereum	1
Isocoma menziesii	1
Other - Malacothrix saxatilis	1
Salix gooddingii - Salix laevigata	1
***Monardella australis* ssp. *cinerea* - CRPR 4.3**	**1**
Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis	1
***Monardella linoides* ssp. *oblonga* - CRPR 1B.3**	**5**
Pinus jeffreyi	4
Prunus emarginata - Holodiscus discolor	1
***Monardella nana* ssp. *leptosiphon* - CRPR 1B.2**	**1**
Pinus coulteri	1

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Monardella sinuata* ssp. *sinuata* - CRPR 1B.2**	**2**
Baccharis pilularis	1
Salvia mellifera - (Artemisia californica)	1
***Monardella undulata* ssp. *arguelloensis* - CRPR 1B.1**	**1**
Artemisia californica - (Salvia leucophylla)	1
***Monardella undulata* ssp. *undulata* - CRPR 1B.2**	**1**
Other - Croton californicus or other dune alliance/association not in MCV	1
***Mucronea californica* - CRPR 4.2**	**13**
Artemisia californica - (Salvia leucophylla)	2
Baccharis pilularis	1
Ceanothus cuneatus	1
Eriophyllum staechadifolium - Erigeron glaucus - Eriogonum latifolium	1
Lupinus chamissonis - Ericameria ericoides	1
Other - Croton californicus - Mucronea californica	1
Other - Croton californicus- Lessingia pectinata	1
Other - Croton californicus or other dune alliance/association not in MCV	1
Quercus agrifolia	2
Salvia mellifera - (Artemisia californica)	2
****Navarretia peninsularis* - CRPR 1B.2**	**1**
Other - Eriogonum kennedyi	1
***Nolina cismontana* - CRPR 1B.2**	**1**
Adenostoma fasciculatum	1
****Opuntia basilaris* var. *brachyclada* - CRPR 1B.2**	**9**
Artemisia tridentata	1
Eriogonum fasciculatum	1
Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis	1
Lotus scoparius - Lupinus albifrons - Eriodictyon spp.	1
Malacothamnus fasciculatus - Malacothamnus spp.	2
Pinus monophylla - (Juniperus osteosperma)	1
Quercus john-tuckeri	2
***Oreonana vestita* - CRPR 1B.3**	**1**
Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis	1

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Packera ionophylla* - CRPR 4.3**	**1**
Quercus kelloggii	1
***Pentachaeta aurea* ssp. *aurea* - CRPR 4.2**	**1**
Gutierrezia sarothrae - Gutierrezia microcephala	1
***Pentagramma rebmanii* - CRPR 1B.3**	**1**
Quercus agrifolia	1
***Perideridia parishii* ssp. *parishii* - CRPR 2B.2**	**2**
Juncus (oxymeris, xiphioides)	1
Rosa californica	1
***Phacelia hubbyi* - CRPR 4.2**	**5**
Amsinckia (menziesii, tessellata) - Phacelia spp.	1
Eschscholzia (californica) - Lupinus (nanus)	1
Juglans californica	2
Salix gooddingii - Salix laevigata	1
***Phlox dolichantha* - CRPR 1B.2**	**1**
Quercus kelloggii	1
***Pinus radiata* - CRPR 1B.1**	**4**
Hesperocyparis macrocarpa - Pinus radiata	3
Quercus agrifolia	1
***Piperia michaelii* - CRPR 4.2**	**2**
Coreopsis gigantea	1
Quercus agrifolia	1
***Prunus fasciculata* var. *punctata* - CRPR 4.3**	**3**
Ceanothus cuneatus	1
Cercocarpus montanus	1
Salvia mellifera - (Artemisia californica)	1
***Quercus dumosa* - CRPR 1B.1**	**2**
Malosma laurina	1
Quercus dumosa - Quercus pacifica	1

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Quercus durata* var. *gabrielensis* - CRPR 4.2**	**33**
Arctostaphylos glandulosa	2
Ceanothus (oliganthus, tomentosus)	1
Ceanothus crassifolius	7
Ceanothus leucodermis	1
Lepidospartum squamatum	1
Lotus scoparius - Lupinus albifrons - Eriodictyon spp.	1
Malosma laurina	3
Other - Fraxinus dipetala	1
Platanus racemosa - Quercus agrifolia	1
Quercus agrifolia	1
Quercus durata	11
Quercus wislizeni - Quercus chrysolepis (shrub)	1
Salvia apiana	1
Salvia mellifera - (Artemisia californica)	1
***Quercus engelmannii* - CRPR 4.2**	**25**
Adenostoma fasciculatum - Salvia spp.	1
Arctostaphylos glandulosa	1
Populus fremontii - Fraxinus velutina - Salix gooddingii	2
Quercus berberidifolia	3
Quercus engelmannii	15
Salvia apiana	2
Toxicodendron diversilobum	1
***Quercus parvula* var. *parvula* - CRPR 4.2**	**11**
Arctostaphylos (purissima, rudis)	2
Ceanothus papillosus	1
Hesperocyparis macrocarpa - Pinus radiata	1
Lupinus chamissonis - Ericameria ericoides	1
Pinus muricata - Pinus radiata	2
Prunus ilicifolia - Heteromeles arbutifolia - Ceanothus spinosus	1
Quercus wislizeni - Quercus chrysolepis (shrub)	3

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Rhinotropis cornuta* var. *fishiae* - CRPR 4.3**	**7**
Alnus rhombifolia	1
Ceanothus (oliganthus, tomentosus)	1
Juglans californica	1
Malosma laurina	1
Platanus racemosa - Quercus agrifolia	1
Prunus ilicifolia - Heteromeles arbutifolia - Ceanothus spinosus	1
Quercus agrifolia	1
***Ribes amarum* var. *hoffmannii* - CRPR 3**	**1**
Umbellularia californica	1
***Romneya coulteri* - CRPR 4.2**	**5**
Artemisia tridentata	1
Ceanothus crassifolius	1
Prunus ilicifolia - Heteromeles arbutifolia - Ceanothus spinosus	1
Rhus integrifolia	1
Xylococcus bicolor	1
***Rupertia rigida* - CRPR 4.3**	**1**
Prunus virginiana	1
***Scrophularia atrata* - CRPR 1B.2**	**12**
Artemisia californica - (Salvia leucophylla)	2
Baccharis pilularis	2
Ceanothus thyrsiflorus	1
Diplacus aurantiacus	1
Eriophyllum staechadifolium - Erigeron glaucus - Eriogonum latifolium	1
Lupinus arboreus	1
Other - Salvia spathacea	1
Quercus agrifolia	1
Toxicodendron diversilobum	2
***Sedum niveum* - CRPR 4.2**	**1**
Selaginella (bigelovii, wallacei)	1
***Selaginella asprella* - CRPR 4.3**	**1**
Eriogonum fasciculatum	1

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
***Senecio blochmaniae* - CRPR 4.2**	**7**
Abronia latifolia - Ambrosia chamissonis	2
Ammophila arenaria	1
Eriophyllum staechadifolium - Erigeron glaucus - Eriogonum latifolium	1
Lupinus chamissonis - Ericameria ericoides	1
Salvia mellifera - (Artemisia californica)	2
***Sidalcea hickmanii* ssp. *parishii* - CRPR 1B.2**	**1**
Bromus tectorum - Taeniatherum caput-medusae	1
***Sidalcea neomexicana* - CRPR 2B.2**	**2**
Carex utriculata - Calamagrostis canadensis	1
Other - Carex subfusca	1
***Sidalcea pedata* - CRPR 1B.1**	**1**
Danthonia californica - Deschampsia cespitosa - Camassia quamash	1
***Sisyrinchium longipes* - CRPR 2B.2**	**1**
Oxypolis occidentalis	1
***Streptanthus bernardinus* - CRPR 4.3**	**1**
Pinus jeffreyi	1
***Suaeda californica* - CRPR 1B.1**	**1**
Other - Hordeum jubatum	1
****Suaeda esteroa* - CRPR 1B.2**	**1**
Sarcocornia pacifica (Salicornia depressa)	1
****Suaeda taxifolia* - CRPR 4.2**	**7**
Atriplex lentiformis	1
Coreopsis gigantea	1
Distichlis spicata - Frankenia salina Coastal	4
Eriophyllum staechadifolium - Erigeron glaucus - Eriogonum latifolium	1

***Rare Taxon* with CRPR** (Field alliances below)	**Total No.**
****Symphyotrichum defoliatum* - CRPR 1B.2**	**6**
Ambrosia psilostachya	1
Anemopsis californica - Helianthus nuttallii - Solidago spectabilis	1
Juncus (effusus, patens) - Carex (pansa, praegracilis)	1
Muhlenbergia rigens	1
Other - Carex subfusca	1
Rosa californica	1
***Thermopsis californica* var. *semota* - CRPR 1B.2**	**2**
Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis	1
Quercus kelloggii	1
***Thermopsis macrophylla* - CRPR 1B.3**	**1**
Arctostaphylos glandulosa	1
***Trichostema micranthum* - CRPR 4.3**	**1**
Salix lasiolepis	1
***Xanthisma junceum* - CRPR 4.3**	**1**
Adenostoma fasciculatum	1

APPENDIX E. ALLIANCES WITH RARE PLANT TAXA

All field alliances with rare plant taxa documented in SCMV surveys are shown below with all rare plant taxa documented and their CRPR within each. Numbers denote the total number of rare plant occurrences for each taxon documented in all alliances combined and the total number of occurrences of each rare plant taxon documented in each alliance.

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Abies concolor	**4**
Keckiella rothrockii var. *jacintensis* - CRPR 1B.3	2
Lilium parryi - CRPR 1B.2	1
Lupinus elatus - CRPR 4.3	1
Abies concolor - Pinus lambertiana	**6**
Acanthoscyphus parishii var. *parishii* - CRPR 4.2	1
Dieteria canescens var. *ziegleri* - CRPR 1B.2	1
Galium angustifolium ssp. *gabrielense* - CRPR 4.3	1
Heuchera hirsutissima - CRPR 1B.3	1
Lupinus elatus - CRPR 4.3	2
Abronia latifolia - Ambrosia chamissonis	**13**
Abronia maritima - CRPR 4.2	6
Cirsium rhothophilum - CRPR 1B.2	1
Malacothrix incana - CRPR 4.3	3
Malacothrix saxatilis var. *saxatilis* - CRPR 4.2	1
Senecio blochmaniae - CRPR 4.2	2
Acer macrophyllum	**2**
Baccharis plummerae ssp. *plummerae* - CRPR 4.3	2
Adenostoma fasciculatum	**13**
Arctostaphylos purissima - CRPR 1B.1	3
Arctostaphylos refugioensis - CRPR 1B.2	1
Arctostaphylos rudis - CRPR 1B.1	1
Calochortus fimbriatus - CRPR 1B.3	1
Calochortus plummerae - CRPR 4.2	2
Calystegia peirsonii - CRPR 4.2	1
Deinandra paniculata - CRPR 4.2	1
Erigeron sanctarum - CRPR 4.2	1
Nolina cismontana - CRPR 1B.2	1
Xanthisma junceum - CRPR 4.3	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Adenostoma fasciculatum - Salvia spp.	**3**
Arctostaphylos purissima - CRPR 1B.1	1
Calochortus fimbriatus - CRPR 1B.3	1
Quercus engelmannii - CRPR 4.2	1
Agastache urticifolia - Geranium viscosissimum - Pteridium aquilinum	**2**
Astragalus oocarpus - CRPR 1B.2	1
Lilium parryi - CRPR 1B.2	1
Alnus rhombifolia	**1**
Rhinotropis cornuta var. *fishiae* - CRPR 4.3	1
Ambrosia psilostachya	**2**
Brodiaea orcuttii - CRPR 1B.1	1
Symphyotrichum defoliatum - CRPR 1B.2	1
Ammophila arenaria	**3**
Abronia maritima - CRPR 4.2	2
Senecio blochmaniae - CRPR 4.2	1
Amsinckia (menziesii, tessellata) - Phacelia spp.	**5**
Acanthomintha obovata ssp. *cordata* - CRPR 4.2	1
Allium howellii var. *clokeyi* - CRPR 1B.3	1
Amsinckia douglasiana - CRPR 4.2	1
Layia heterotricha - CRPR 1B.1	1
Phacelia hubbyi - CRPR 4.2	1
Anemopsis californica - Helianthus nuttallii - Solidago spectabilis	**1**
Symphyotrichum defoliatum - CRPR 1B.2	1
Arctostaphylos (purissima, rudis)	**47**
Arctostaphylos purissima - CRPR 1B.1	20
Arctostaphylos rudis - CRPR 1B.1	13
Ceanothus cuneatus var. *fascicularis* - CRPR 4.2	3
Ceanothus impressus var. *impressus* - CRPR 1B.2	9
Quercus parvula var. *parvula* - CRPR 4.2	2

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Arctostaphylos glandulosa	**7**
Baccharis plummerae ssp. *plummerae* - CRPR 4.3	2
Diplacus clevelandii - CRPR 4.2	1
Quercus durata var. *gabrielensis* - CRPR 4.2	2
Quercus engelmannii - CRPR 4.2	1
Thermopsis macrophylla - CRPR 1B.3	1
Arctostaphylos glauca	**1**
Calystegia collina ssp. *venusta* - CRPR 4.3	1
Arctostaphylos pungens - Arctostaphylos pringlei	**2**
Arctostaphylos parryana ssp. *tumescens* - CRPR 4.3	1
Lonicera subspicata var. *subspicata* - CRPR 1B.2	1
Aristida purpurea - Elymus elymoides - Poa secunda	**1**
Allium howellii var. *clokeyi* - CRPR 1B.3	1
Artemisia californica - (Salvia leucophylla)	**11**
Calochortus clavatus var. *clavatus* - CRPR 4.3	2
Deinandra paniculata - CRPR 4.2	1
Juglans californica - CRPR 4.2	3
Monardella undulata ssp. *arguelloensis* - CRPR 1B.1	1
Mucronea californica - CRPR 4.2	2
Scrophularia atrata - CRPR 1B.2	2
Artemisia nova	**2**
Lessingia tenuis - CRPR 4.3	2
Artemisia rothrockii	**2**
Castilleja cinerea - CRPR 1B.2	1
Eriogonum evanidum - CRPR 1B.1	1
Artemisia tridentata	**4**
Astragalus douglasii var. *perstrictus* - CRPR 1B.2	1
Holocarpha virgata ssp. *elongata* - CRPR 4.2	1
Opuntia basilaris var. *brachyclada* - CRPR 1B.2	1
Romneya coulteri - CRPR 4.2	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Atriplex lentiformis	**3**
Abronia maritima - CRPR 4.2	1
Malacothrix saxatilis var. *saxatilis* - CRPR 4.2	1
Suaeda taxifolia - CRPR 4.2	1
Baccharis pilularis	**7**
Castilleja latifolia - CRPR 4.3	1
Hesperocyparis macrocarpa - CRPR 1B.2	1
Juglans californica - CRPR 4.2	1
Monardella sinuata ssp. *sinuata* - CRPR 1B.2	1
Mucronea californica - CRPR 4.2	1
Scrophularia atrata - CRPR 1B.2	2
Baccharis salicifolia	**1**
Juncus acutus ssp. *leopoldii* - CRPR 4.2	1
Bromus tectorum - Taeniatherum caput-medusae	**1**
Sidalcea hickmanii ssp. *parishii* - CRPR 1B.2	1
Cakile (edentula, maritima)	**1**
Abronia maritima - CRPR 4.2	1
Calocedrus decurrens	**1**
Lilium parryi - CRPR 1B.2	1
Carex utriculata - Calamagrostis canadensis	**1**
Sidalcea neomexicana - CRPR 2B.2	1
Ceanothus (oliganthus, tomentosus)	**6**
Baccharis plummerae ssp. *plummerae* - CRPR 4.3	1
Galium cliftonsmithii - CRPR 4.3	1
Lilium humboldtii ssp. *ocellatum* - CRPR 4.2	1
Lonicera subspicata var. *subspicata* - CRPR 1B.2	1
Quercus durata var. *gabrielensis* - CRPR 4.2	1
Rhinotropis cornuta var. *fishiae* - CRPR 4.3	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Ceanothus cordulatus - Ceanothus integerrimus	**2**
Keckiella rothrockii var. *jacintensis* - CRPR 1B.3	1
Lupinus elatus - CRPR 4.3	1
Ceanothus crassifolius	**10**
Arctostaphylos purissima - CRPR 1B.1	1
Ceanothus impressus var. *impressus* - CRPR 1B.2	1
Quercus durata var. *gabrielensis* - CRPR 4.2	7
Romneya coulteri - CRPR 4.2	1
Ceanothus cuneatus	**7**
Arctostaphylos rudis - CRPR 1B.1	1
Calochortus clavatus var. *clavatus* - CRPR 4.3	1
Calystegia peirsonii - CRPR 4.2	1
Juglans californica - CRPR 4.2	2
Mucronea californica - CRPR 4.2	1
Prunus fasciculata var. *punctata* - CRPR 4.3	1
Ceanothus greggii - Fremontodendron californicum	**5**
Chorizanthe leptotheca - CRPR 4.2	1
Delphinium parryi ssp. *purpureum* - CRPR 4.3	1
Hesperocyparis forbesii - CRPR 1B.1	1
Lessingia tenuis - CRPR 4.3	1
Linanthus orcuttii - CRPR 1B.3	1
Ceanothus leucodermis	**2**
Juglans californica - CRPR 4.2	1
Quercus durata var. *gabrielensis* - CRPR 4.2	1
Ceanothus megacarpus	**2**
Cercocarpus betuloides var. *blancheae* - CRPR 4.3	1
Lonicera subspicata var. *subspicata* - CRPR 1B.2	1
Ceanothus papillosus	**1**
Quercus parvula var. *parvula* - CRPR 4.2	1
Ceanothus thyrsiflorus	**2**
Ceanothus impressus var. *impressus* - CRPR 1B.2	1
Scrophularia atrata - CRPR 1B.2	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Centromadia (pungens)	**1**
Centromadia parryi ssp. *australis* - CRPR 1B.1	1
Cercocarpus ledifolius	**1**
Lupinus elatus - CRPR 4.3	1
Cercocarpus montanus	**4**
Arctostaphylos rudis - CRPR 1B.1	1
Calochortus plummerae - CRPR 4.2	2
Prunus fasciculata var. *punctata* - CRPR 4.3	1
Chrysothamnus viscidiflorus	**1**
Fritillaria pinetorum - CRPR 4.3	1
Coreopsis gigantea	**4**
Astragalus nuttallii var. *nuttallii* - CRPR 4.3	2
Piperia michaelii - CRPR 4.2	1
Suaeda taxifolia - CRPR 4.2	1
Corethrogyne filaginifolia - Eriogonum (elongatum, nudum)	**1**
Diplacus johnstonii - CRPR 4.3	1
Danthonia californica - Deschampsia cespitosa - Camassia quamash	**1**
Sidalcea pedata - CRPR 1B.1	1
Deinandra fasciculata	**1**
Calochortus clavatus var. *cla*vatus - CRPR 4.3	1
Diplacus aurantiacus	**2**
Castilleja latifolia - CRPR 4.3	1
Scrophularia atrata - CRPR 1B.2	1
Distichlis spicata - Frankenia salina Coastal	**7**
Malacothrix saxatilis var. *saxatilis* - CRPR 4.2	3
Suaeda taxifolia - CRPR 4.2	4
Dudleya cymosa - Dudleya lanceolata / Lichen - Moss	**1**
Dudleya multicaulis - CRPR 1B.2	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Encelia californica - Eriogonum cinereum	**2**
Hesperocyparis macrocarpa - CRPR 1B.2	1
Malacothrix saxatilis var. *saxatilis* - CRPR 4.2	1
Ericameria nauseosa	**7**
Acanthomintha obovata ssp. *cordata* - CRPR 4.2	1
Allium howellii var. *clokeyi* - CRPR 1B.3	1
Castilleja plagiotoma - CRPR 4.3	1
Layia heterotricha - CRPR 1B.1	3
Malacothamnus marrubioides - CRPR 4.2	1
Eriogonum fasciculatum	**6**
Calochortus plummerae - CRPR 4.2	1
Calystegia collina ssp. *venusta* - CRPR 4.3	1
Ericameria cuneata var. *macrocephala* - CRPR 1B.3	1
Erigeron parishii - CRPR 1B.1	1
Opuntia basilaris var. *brachyclada* - CRPR 1B.2	1
Selaginella asprella - CRPR 4.3	1
Eriogonum fasciculatum - Salvia apiana	**1**
Calochortus plummerae - CRPR 4.2	1
Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis	**13**
Astragalus leucolobus - CRPR 1B.2	1
Castilleja cinerea - CRPR 1B.2	2
Eriogonum umbellatum var. *minus* - CRPR 4.3	1
Frasera neglecta - CRPR 4.3	1
Grindelia hallii - CRPR 1B.2	2
Lupinus elatus - CRPR 4.3	2
Monardella australis ssp. *cinerea* - CRPR 4.3	1
Opuntia basilaris var. *brachyclada* - CRPR 1B.2	1
Oreonana vestita - CRPR 1B.3	1
Thermopsis californica var. *semota* - CRPR 1B.2	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Eriophyllum staechadifolium - Erigeron glaucus - Eriogonum latifolium	**6**
Abronia maritima - CRPR 4.2	1
Cirsium rhothophilum - CRPR 1B.2	1
Mucronea californica - CRPR 4.2	1
Scrophularia atrata - CRPR 1B.2	1
Senecio blochmaniae - CRPR 4.2	1
Suaeda taxifolia - CRPR 4.2	1
Eschscholzia (californica) - Lupinus (nanus)	**1**
Phacelia hubbyi - CRPR 4.2	1
Eucalyptus spp. - Ailanthus altissima - Robinia pseudoacacia	**2**
Hesperocyparis macrocarpa - CRPR 1B.2	2
Gutierrezia sarothrae - Gutierrezia microcephala	**2**
Chorizanthe polygonoides var. *longispina* - CRPR 1B.2	1
Pentachaeta aurea ssp. *aurea* - CRPR 4.2	1
Hazardia squarrosa	**1**
Juglans californica - CRPR 4.2	1
Hesperocyparis forbesii - Hesperocyparis nevadensis	**4**
Arctostaphylos otayensis - CRPR 1B.2	1
Hesperocyparis forbesii - CRPR 1B.1	3
Hesperocyparis macrocarpa - Pinus radiata	**10**
Arctostaphylos purissima - CRPR 1B.1	1
Hesperocyparis macrocarpa - CRPR 1B.2	5
Pinus radiata - CRPR 1B.1	3
Quercus parvula var. *parvula* - CRPR 4.2	1
Hesperocyparis stephensonii	**5**
Hesperocyparis stephensonii - CRPR 1B.1	5
Isocoma menziesii	**1**
Malacothrix saxatilis var. *saxatilis* - CRPR 4.2	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Juglans californica	**36**
Baccharis plummerae ssp. *plummerae* - CRPR 4.3	1
Juglans californica - CRPR 4.2	32
Phacelia hubbyi - CRPR 4.2	2
Rhinotropis cornuta var. *fishiae* - CRPR 4.3	1
Juncus (effusus, patens) - Carex (pansa, praegracilis)	**2**
Juncus acutus ssp. *leopoldii* - CRPR 4.2	1
Symphyotrichum defoliatum - CRPR 1B.2	1
Juncus (oxymeris, xiphioides)	**2**
Grindelia hallii - CRPR 1B.2	1
Perideridia parishii ssp. *parishii* - CRPR 2B.2	1
Juniperus grandis	**1**
Astragalus bicristatus - CRPR 4.3	1
Lasthenia californica - Plantago erecta - Vulpia microstachys	**1**
Calystegia collina ssp. *venusta* - CRPR 4.3	1
Lepidospartum squamatum	**1**
Quercus durata var. *gabrielensis* - CRPR 4.2	1
Leymus cinereus - Leymus triticoides	**2**
Astragalus lentiginosus var. *sierrae* - CRPR 1B.2	1
Carex occidentalis - CRPR 2B.3	1
Lotus scoparius - Lupinus albifrons - Eriodictyon spp.	**5**
Calochortus weedii var. *intermedius* - CRPR 1B.2	1
Ceanothus foliosus var. *viejasensis* - CRPR 1B.2	1
Diplacus johnstonii - CRPR 4.3	1
Opuntia basilaris var. *brachyclada* - CRPR 1B.2	1
Quercus durata var. *gabrielensis* - CRPR 4.2	1
Lupinus arboreus	**1**
Scrophularia atrata - CRPR 1B.2	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Lupinus chamissonis - Ericameria ericoides	**6**
Abronia maritima - CRPR 4.2	1
Astragalus nuttallii var. *nuttallii* - CRPR 4.3	1
Ceanothus impressus var. *impressus* - CRPR 1B.2	1
Mucronea californica - CRPR 4.2	1
Quercus parvula var. *parvula* - CRPR 4.2	1
Senecio blochmaniae - CRPR 4.2	1
Malacothamnus fasciculatus - Malacothamnus spp.	**5**
Astragalus albens - CRPR 1B.1	1
Calystegia peirsonii - CRPR 4.2	1
Malacothamnus davidsonii - CRPR 1B.2	1
Opuntia basilaris var. *brachyclada* - CRPR 1B.2	2
Malosma laurina	**10**
Baccharis plummerae ssp. *plummerae* - CRPR 4.3	1
Juglans californica - CRPR 4.2	2
Lonicera subspicata var. *subspicata* - CRPR 1B.2	1
Malacothamnus davidsonii - CRPR 1B.2	1
Quercus dumosa - CRPR 1B.1	1
Quercus durata var. *gabrielensis* - CRPR 4.2	3
Rhinotropis cornuta var. *fishiae* - CRPR 4.3	1
Mesembryanthemum spp. - Carpobrotus spp.	**3**
Abronia maritima - CRPR 4.2	1
Astragalus nuttallii var. *nuttallii* - CRPR 4.3	1
Malacothrix incana - CRPR 4.3	1
Mimulus guttatus - Cirsium spp. - Stachys spp.	**2**
Carex occidentalis - CRPR 2B.3	1
Heuchera parishii - CRPR 1B.3	1
Monolopia (lanceolata) - Coreopsis (calliopsidea)	**1**
Acanthomintha obovata ssp. *cordata* - CRPR 4.2	1
Muhlenbergia rigens	**1**
Symphyotrichum defoliatum - CRPR 1B.2	1
Nassella spp. - Melica spp.	**1**

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Calystegia collina ssp. *venusta* - CRPR 4.3	1
Opuntia littoralis - Opuntia oricola - Cylindropuntia prolifera	**1**
Juglans californica - CRPR 4.2	1
Other - Arctostaphylos refugioensis	**4**
Arctostaphylos refugioensis - CRPR 1B.2	3
Galium cliftonsmithii - CRPR 4.3	1
Other - Calochortus catalinae post-fire stand	**1**
Calystegia collina ssp. *venusta* - CRPR 4.3	1
Other - Carex senta	**1**
Lilium parryi - CRPR 1B.2	1
Other - Carex subfusca	**3**
Horkelia yadonii - CRPR 4.2	1
Sidalcea neomexicana - CRPR 2B.2	1
Symphyotrichum defoliatum - CRPR 1B.2	1
Other - Ceanothus impressus	**5**
Arctostaphylos purissima - CRPR 1B.1	2
Arctostaphylos rudis - CRPR 1B.1	1
Ceanothus impressus var. *impressus* - CRPR 1B.2	2
Other - Croton californicus or sandy herbland	**5**
Deinandra paniculata - CRPR 4.2	1
Monardella undulata ssp. *undulata* - CRPR 1B.2	1
Mucronea californica - CRPR 4.2	3
Other - Ehrharta calycina	**1**
Arctostaphylos rudis - CRPR 1B.1	1
Other - Ericameria arborescens	**1**
Calochortus fimbriatus - CRPR 1B.3	1
Other - Ericameria brachylepis/Cylindropuntia spp.	**1**
Cylindropuntia wolfii - CRPR 4.3	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Other - Eriogonum kennedyi	**34**
Androsace elongata ssp. *acuta* - CRPR 4.2	2
Astragalus leucolobus - CRPR 1B.2	1
Boechera parishii - CRPR 1B.2	7
Castilleja cinerea - CRPR 1B.2	4
Dudleya abramsii ssp. *affinis* - CRPR 1B.2	5
Eremogone ursina - CRPR 1B.2	5
Eriogonum kennedyi var. *austromontanum* - CRPR 1B.2	3
Ivesia argyrocoma var. *argyrocoma* - CRPR 1B.2	5
Linanthus killipii - CRPR 1B.2	1
Navarretia peninsularis - CRPR 1B.2	1
Other - Fraxinus dipetala	**4**
Baccharis plummerae ssp. *plummerae* - CRPR 4.3	1
Clinopodium chandleri - CRPR 1B.2	1
Juglans californica - CRPR 4.2	1
Quercus durata var. *gabrielensis* - CRPR 4.2	1
Other - Hordeum jubatum	**1**
Suaeda californica - CRPR 1B.1	1
Other - Horkelia rydbergii - Sidalcea sparsifolia ephemeral drainage forbland?	**1**
Lessingia tenuis - CRPR 4.3	1
Other - Lessingia tenuis	**3**
Lessingia tenuis - CRPR 4.3	3
Other - Malacothrix saxatilis	**1**
Malacothrix saxatilis var. *saxatilis* - CRPR 4.2	1
Other - Salvia spathacea	**1**
Scrophularia atrata - CRPR 1B.2	1
Other - Scree forbland	**8**
Caulanthus amplexicaulis var. *barbarae* - CRPR 1B.1	1
Diplacus johnstonii - CRPR 4.3	6
Linanthus concinnus - CRPR 1B.2	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Oxypolis occidentalis	**1**
Sisyrinchium longipes - CRPR 2B.2	1
Pinus contorta ssp. murrayana	**1**
Keckiella rothrockii var. *jacintensis* - CRPR 1B.3	1
Pinus coulteri	**4**
Dieteria asteroides var. *lagunensis* - CRPR 2B.1	1
Diplacus johnstonii - CRPR 4.3	1
Grindelia hallii - CRPR 1B.2	1
Monardella nana ssp. *leptosiphon* - CRPR 1B.2	1
Pinus jeffreyi	**12**
Frasera neglecta - CRPR 4.3	4
Keckiella rothrockii var. *jacintensis* - CRPR 1B.3	1
Lessingia tenuis - CRPR 4.3	1
Lupinus elatus - CRPR 4.3	1
Monardella linoides ssp. *oblonga* - CRPR 1B.3	4
Streptanthus bernardinus - CRPR 4.3	1
Pinus monophylla - (Juniperus osteosperma)	**2**
Astragalus albens - CRPR 1B.1	1
Opuntia basilaris var. *brachyclada* - CRPR 1B.2	1
Pinus muricata - Pinus radiata	**8**
Arctostaphylos purissima - CRPR 1B.1	3
Ceanothus impressus var. *impressus* - CRPR 1B.2	3
Quercus parvula var. *parvula* - CRPR 4.2	2
Pinus sabiniana	**1**
Calystegia collina ssp. *venusta* - CRPR 4.3	1
Plagiobothrys nothofulvus	**1**
Delphinium umbraculorum - CRPR 1B.3	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Platanus racemosa - Quercus agrifolia	**14**
Berberis nevinii - CRPR 1B.1	1
Calochortus palmeri var. *palmeri* - CRPR 1B.2	1
Juglans californica - CRPR 4.2	10
Quercus durata var. *gabrielensis* - CRPR 4.2	1
Rhinotropis cornuta var. *fishiae* - CRPR 4.3	1
Populus fremontii - Fraxinus velutina - Salix gooddingii	**3**
Juncus acutus ssp. *leopoldii* - CRPR 4.2	1
Quercus engelmannii - CRPR 4.2	2
Populus trichocarpa	**1**
Juglans californica - CRPR 4.2	1
Prunus emarginata - Holodiscus discolor	**1**
Monardella linoides ssp. *oblonga* - CRPR 1B.3	1
Prunus fasciculata - Salazaria mexicana	**2**
Astragalus leucolobus - CRPR 1B.2	1
Castilleja plagiotoma - CRPR 4.3	1
Prunus ilicifolia - Heteromeles arbutifolia - Ceanothus spinosus	**10**
Arctostaphylos purissima - CRPR 1B.1	1
Baccharis plummerae ssp. *plummerae* - CRPR 4.3	3
Ceanothus cuneatus var. *fascicularis* - CRPR 4.2	1
Lonicera subspicata var. *subspicata* - CRPR 1B.2	2
Quercus parvula var. *parvula* - CRPR 4.2	1
Rhinotropis cornuta var. *fishiae* - CRPR 4.3	1
Romneya coulteri - CRPR 4.2	1
Prunus virginiana	**1**
Rupertia rigida - CRPR 4.3	1
Pseudotsuga macrocarpa	**3**
Galium johnstonii - CRPR 4.3	1
Lilium humboldtii ssp. *ocellatum* - CRPR 4.2	2

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Quercus agrifolia	**30**
Agrostis hooveri - CRPR 1B.2	1
Arctostaphylos purissima - CRPR 1B.1	3
Arctostaphylos rudis - CRPR 1B.1	4
Baccharis plummerae ssp. *plummerae* - CRPR 4.3	1
Brodiaea orcuttii - CRPR 1B.1	1
Ceanothus cuneatus var. *fascicularis* - CRPR 4.2	2
Ceanothus impressus var. *impressus* - CRPR 1B.2	1
Clinopodium chandleri - CRPR 1B.2	2
Cordylanthus rigidus ssp. *littoralis* - CRPR 1B.1	1
Juglans californica - CRPR 4.2	3
Lilium humboldtii ssp. *ocellatum* - CRPR 4.2	1
Linanthus californicus ssp. *tomentosus* - CRPR 4.2	1
Lonicera subspicata var. *subspicata* - CRPR 1B.2	1
Mucronea californica - CRPR 4.2	2
Pentagramma rebmanii - CRPR 1B.3	1
Pinus radiata - CRPR 1B.1	1
Piperia michaelii - CRPR 4.2	1
Quercus durata var. *gabrielensis* - CRPR 4.2	1
Rhinotropis cornuta var. *fishiae* - CRPR 4.3	1
Scrophularia atrata - CRPR 1B.2	1
Quercus berberidifolia	**4**
Baccharis plummerae ssp. *plummerae* - CRPR 4.3	1
Quercus engelmannii - CRPR 4.2	3
Quercus chrysolepis (tree)	**3**
Aphyllon epigalium ssp. *notocalifornicum* - CRPR 1B.3	1
Baccharis plummerae ssp. *plummerae* - CRPR 4.3	2
Quercus cornelius-mulleri	**1**
Geraea viscida - CRPR 2B.2	1
Quercus dumosa - Quercus pacifica	**1**
Quercus dumosa - CRPR 1B.1	1
Quercus durata	**12**
Aphyllon validum ssp. *validum* - CRPR 1B.2	1
Quercus durata var. *gabrielensis* - CRPR 4.2	11

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Quercus engelmannii	**16**
Astragalus oocarpus - CRPR 1B.2	1
Quercus engelmannii - CRPR 4.2	15
Quercus john-tuckeri	**3**
Allium howellii var. *clokeyi* - CRPR 1B.3	1
Opuntia basilaris var. *brachyclada* - CRPR 1B.2	2
Quercus kelloggii	**4**
Heuchera parishii - CRPR 1B.3	1
Packera ionophylla - CRPR 4.3	1
Phlox dolichantha - CRPR 1B.2	1
Thermopsis californica var. *semota* - CRPR 1B.2	1
Quercus lobata	**1**
Juglans californica - CRPR 4.2	1
Quercus lobata Riparian	**1**
Juglans californica - CRPR 4.2	1
Quercus wislizeni - Quercus chrysolepis (shrub)	**11**
Arctostaphylos parryana ssp. *tumescens* - CRPR 4.3	1
Arctostaphylos purissima - CRPR 1B.1	2
Arctostaphylos rudis - CRPR 1B.1	1
Ceanothus cuneatus var. *fascicularis* - CRPR 4.2	2
Ceanothus impressus var. *impressus* - CRPR 1B.2	1
Quercus durata var. *gabrielensis* - CRPR 4.2	1
Quercus parvula var. *parvula* - CRPR 4.2	3
Rhus integrifolia	**3**
Juglans californica - CRPR 4.2	2
Romneya coulteri - CRPR 4.2	1
Rosa californica	**2**
Perideridia parishii ssp. *parishii* - CRPR 2B.2	1
Symphyotrichum defoliatum - CRPR 1B.2	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Salix gooddingii - Salix laevigata	**8**
Juglans californica - CRPR 4.2	6
Malacothrix saxatilis var. *saxatilis* - CRPR 4.2	1
Phacelia hubbyi - CRPR 4.2	1
Salix lasiolepis	**3**
Juglans californica - CRPR 4.2	2
Trichostema micranthum - CRPR 4.3	1
Salvia apiana	**5**
Calochortus clavatus var. *clavatus* - CRPR 4.3	1
Juglans californica - CRPR 4.2	1
Quercus durata var. *gabrielensis* - CRPR 4.2	1
Quercus engelmannii - CRPR 4.2	2
Salvia mellifera - (Artemisia californica)	**7**
Monardella sinuata ssp. *sinuata* - CRPR 1B.2	1
Mucronea californica - CRPR 4.2	2
Prunus fasciculata var. *punctata* - CRPR 4.3	1
Quercus durata var. *gabrielensis* - CRPR 4.2	1
Senecio blochmaniae - CRPR 4.2	2
Sarcocornia pacifica (Salicornia depressa)	**3**
Distichlis littoralis - CRPR 4.2	2
Suaeda esteroa - CRPR 1B.2	1
Selaginella (bigelovii, wallacei)	**3**
Calochortus plummerae - CRPR 4.2	1
Heuchera parishii - CRPR 1B.3	1
Sedum niveum - CRPR 4.2	1
Sphaeralcea (ambigua, coccinea, parvifolia)	**1**
Astragalus leucolobus - CRPR 1B.2	1
Sporobolus airoides - Muhlenbergia asperifolia - Spartina gracilis	**1**
Juncus acutus ssp. *leopoldi*i - CRPR 4.2	1

Field Alliance (*Rare Taxon* with CRPR below)	**Total No.**
Toxicodendron diversilobum	**5**
Juglans californica - CRPR 4.2	2
Quercus engelmannii - CRPR 4.2	1
Scrophularia atrata - CRPR 1B.2	2
Typha (angustifolia, domingensis, latifolia)	**1**
Juncus acutus ssp. *leopoldii* - CRPR 4.2	1
Umbellularia californica	**8**
Baccharis plummerae ssp. *plummerae* - CRPR 4.3	2
Galium cliftonsmithii - CRPR 4.3	1
Juglans californica - CRPR 4.2	1
Lilium humboldtii ssp. *ocellatum* - CRPR 4.2	2
Lonicera subspicata var. *subspicata* - CRPR 1B.2	1
Ribes amarum var. *hoffmannii* - CRPR 3	1
Xylococcus bicolor	**1**
Romneya coulteri - CRPR 4.2	1

APPENDIX F. NOTEWORTHY TAXA

Noteworthy taxa documented during vegetation sampling include three major range extensions, one taxonomically confusing, as well as a possibly undescribed taxon. A discussion of each of these taxa is included below. Specimens documenting these were submitted to the Jepson Herbarium in January 2025 and January 2026.

F1. ***ARTEMISIA NOVA***

F2. ***CALAMAGROSTIS STRICTA* SUBSP*. STRICTA***

F3*.* ***ORTHOCARPUS CUSPIDATUS* SUBSP*. CRYPTANTHUS***

F4. ***CRYPTANTHA* SP*.***

F1. ARTEMISIA NOVA

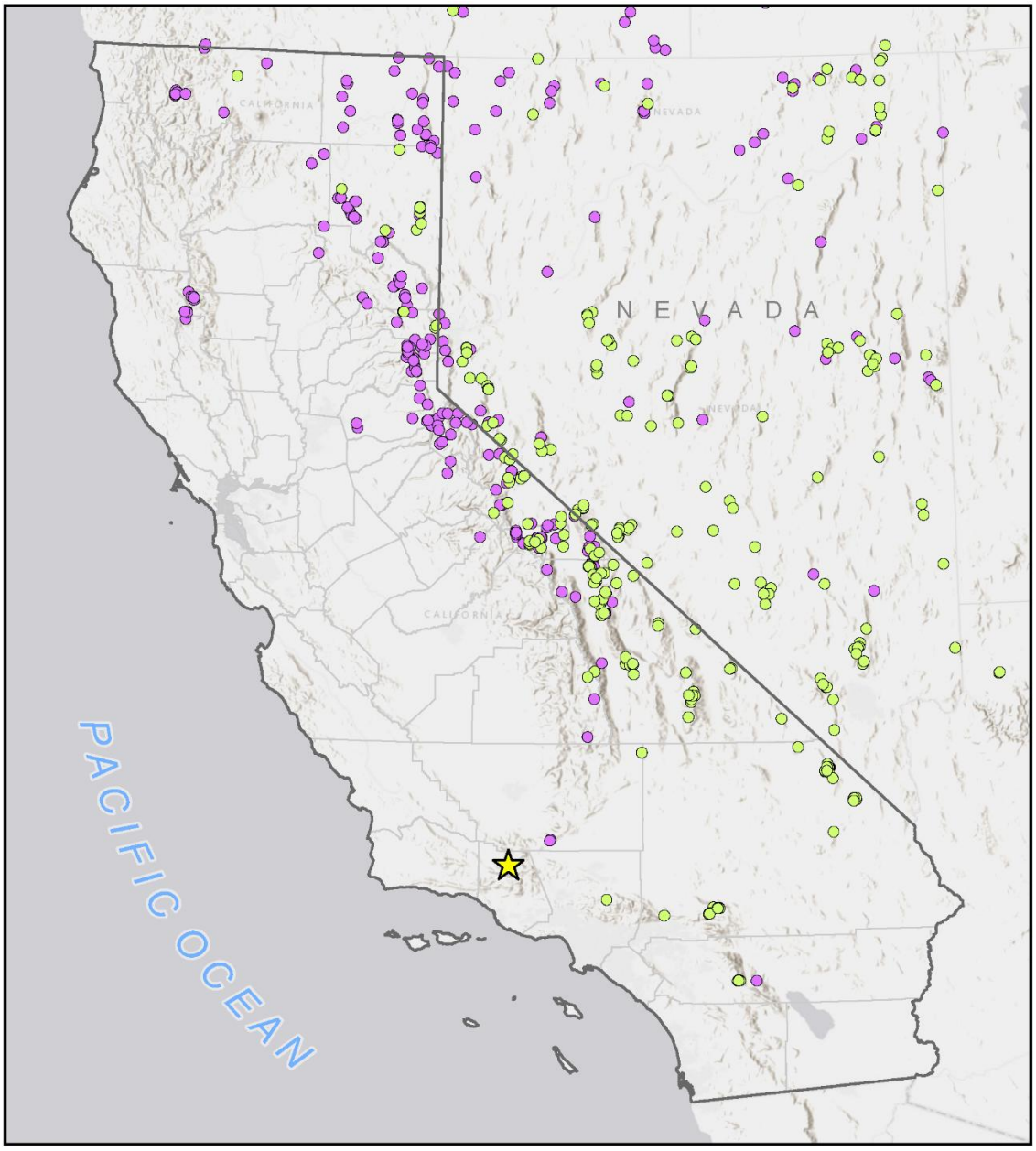
Plants called *Artemisia nova* during this project, forming stands or as a component of other vegetation types, are from populations disjunct from most of the range of this species. There has been some debate as to whether what has been called *Artemisia nova* from the San Bernardino and San Jacinto Mountains of southern California is in fact *Artemisia nova*, *Artemisia arbuscula*, intermediate between the two, or an undescribed taxon. Range-wide analysis (possibly phylogenetic) of these and related species is likely needed to resolve the identity of these plants. So, identification of these taxa from this project should be considered tentative. From a vegetation classification analysis standpoint, both the *Artemisia nova* and *Artemisia arbuscula* alliances should be considered for what was called *Artemisia nova* in these regions.

On September 11, 2024, Keir Morse found plants in Ventura County near Lockwood Valley that were very similar to those from the San Bernardino and San Jacinto Mountains and growing in very similar habitat (Photo Set F1, Figure F1). A specimen was collected as SCMV-ARTNOV by Keir on September 23, 2024. Surveys were done in this area in June 2025 (SCMV3199 and SCMV4130) and vegetation observation points note the location of some stands not surveyed. Two vegetation surveys from another project in this area are likely dominated or codominated by this *Artemisia* species as well (UTOM0038 and UTOM0039). One of those has comments in the data suspecting this.

Assuming they are *Artemisia nova*, the San Bernardino Mountain plants are closest geographically to the Ventura County plants and approximately 200 km to the east. There is one record from the San Gabriel Mountains in-between but a search for these plants found no similar habitat and small plants of *Artemisia tridentata* that could be confused with *Artemisia nova*. So, the San Gabriel Mountain plants are likely misidentified. There are also observations called *Artemisia arbuscula* from the Tehachapi Mountains but photos of these found on the Calflora website look much more robust than what has been called *Artemisia nova* in southern California.

PHOTO SET F1. POSSIBLE *ARTEMISIA NOVA* NEAR SAN GUILLERMO MOUNTAIN IN VENTURA COUNTY (LEFT 9/11/2024, RIGHT 6/5/2025).

FIGURE F1. RANGE EXTENSION OF *ARTEMISIA AFF. NOVA*



Legend

- *Artemisia arbuscula*
- *Artemisia nova*
- Range Extension

Southern California Coast and Mountains and Valleys Ecoregions Vegetation Sampling
Map Center: 37.32105°N 119.04312°W
California, United States of America

N

0 50 100 Miles

Basemap Source:
Esri Light Gray and Esri World Hillshade

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Map Updated:
February 27, 2026 04:14 PM by SS

F2. CALAMAGROSTIS STRICTA SUBSP. STRICTA

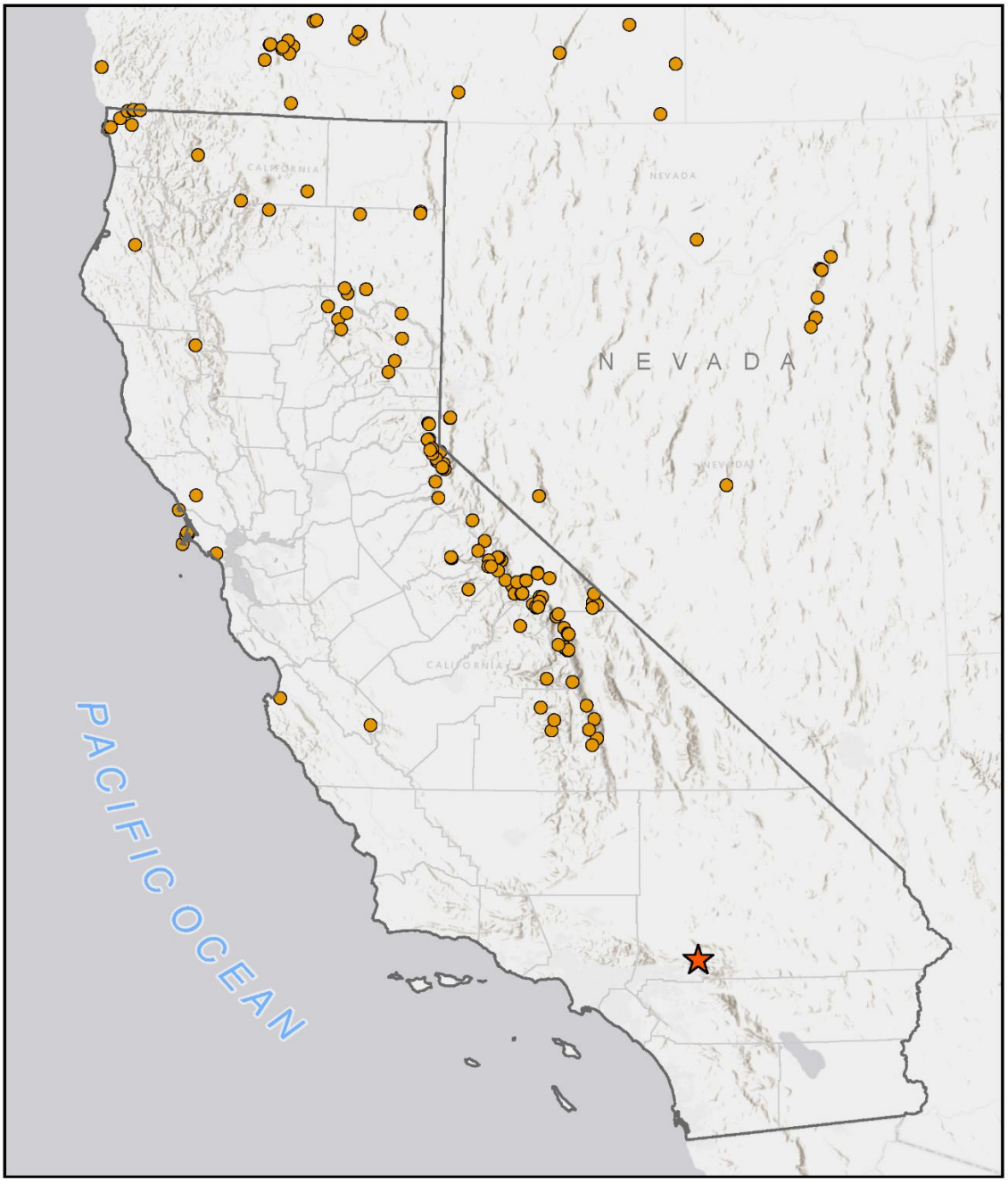
The Jepson eFlora recognizes two subspecies of *Calamagrostis stricta*. There are a few specimens identified as *Calamagrostis stricta* subsp. *inexpansa* (*Calamagrostis inexpansa* on iNaturalist) from southern California, which may or may not be correctly identified. There, however, appears to be no documentation of *Calamagrostis stricta* subsp. *stricta* from southern California before this project.

On August 6, 2024, Keir Morse collected a specimen (SCMV3051-2) identified as *Calamagrostis stricta* subsp. *stricta* from west of Bluff Lake in the San Bernardino Mountains (Photo Set F2, Figure F2). This was collected from a wet meadow stand (SCMV3051) classified as the *Carex utriculata* - *Calamagrostis canadensis* Herbaceous Alliance and codominated by *Carex utriculata* Boott, *Carex nebrascensis* Dewey, and *Mentha canadensis* L. The nearest documented occurrence identified to this subspecies that could be found (UCD57778) was from ~250 km north of this site in the Sierra Nevada Mountains of Tulare County.

There is a single specimen from the San Bernardino Mountains identified to *Calamagrostis stricta* subsp. *inexpansa* collected near Bluff Lake in 2019 (OBI147842). This suggests that SCMV3051-2 or OBI147842 may be misidentified and should possibly be examined by a grass expert. The keys between these subspecies have a lot of overlap and ambiguity.

PHOTO SET F2. *CALAMAGROSTIS STRICTA* SUBSP. *STRICTA* NEAR BLUFF LAKE IN THE SAN BERNARDINO MOUNTAINS (8/6/2024).

FIGURE F2. RANGE EXTENSION OF *CALAMAGROSTIS STRICTA*



F3. ORTHOCARPUS CUSPIDATUS SUBSP. CRYPTANTHUS

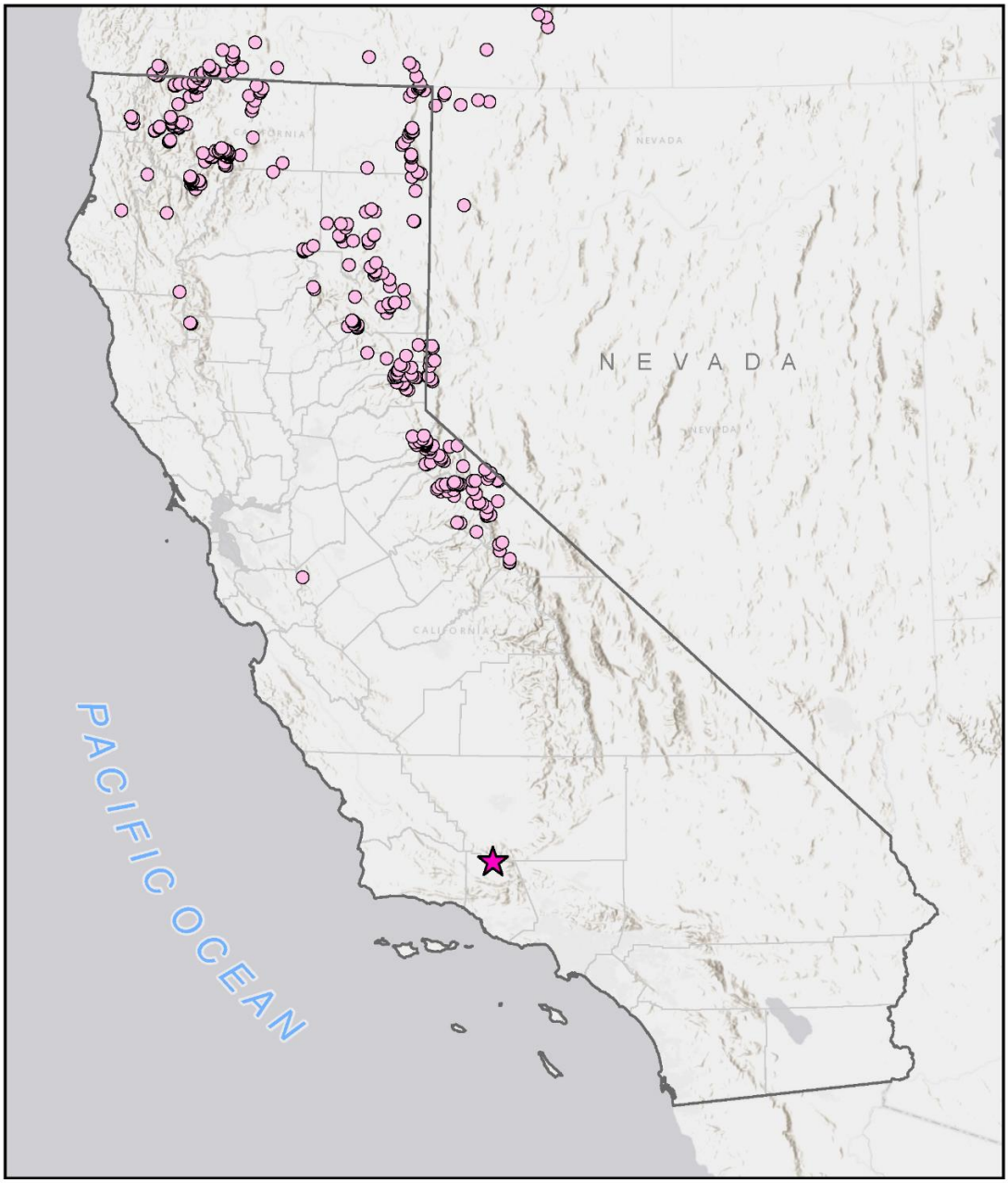
In California, *Orthocarpus cuspidatus* subsp. *cryptanthus* was thought to only occur in the higher elevations of the Cascade Ranges, north & central Sierra Nevada Ranges, and Great Basin provinces from Mono County northwards.

On July 22, 2024, Keir Morse and Zach Kinman found a small population on Mount Pinos near the border of Kern and Ventura counties. Keir photographed and vouchered it the next day as collection SCMV-OCC (Photo Set F3, Figure F3). This collection was collected from an area between surveys SCMV3023 and SCMV3025. The nearest documented occurrence of this species and subspecies (SJSU6230) was collected ~314 km to the northeast near Mammoth Lakes in Mono County.

The collection is from a stand dominated by *Eriogonum wrightii* var. *subscaposum* (*Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis* Shrubland Alliance) with *Phlox diffusa* Benth., *Penstemon labrosus* A. Gray) Hook. f., *Silene verecunda* S. Watson, *Ivesia santolinoides* A. Gray, *Castilleja applegatei* var. *pinetorum* (Fernald) T. I. Chuang & Heckard, *Chrysothamnus viscidiflorus* (Hook.) Nutt., and *Pedicularis semibaccata* A. Gray.

PHOTO SET F3. *ORTHOCARPUS CUSPIDATUS* SSP. *CRYPTANTHUS* ON MOUNT PINOS (7/23/2024).

FIGURE F3. RANGE EXTENSION OF *ORTHOCARPUS CUSPIDATUS* SUBSP. *CRYPTANTHUS*



Legend

Previous Collections Range Extension

Southern California Coast and Mountains and Valleys Ecoregions Vegetation Sampling
Map Center: 37.32105°N 119.04312°W
California, United States of America

N

0 50 100 Miles

Basemap Source:
Esri Light Gray and Esri World Hillshade

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February 27, 2026 04:12 PM by SS

F4. CRYPTANTHA SP.

A *Cryptantha* collected by Keir Morse and Keenan Harris on June 4th and 5th of 2025 (SCMV3198-3 and SCMV3199-2) near San Guillermo Mountain in Ventura County was initially keyed to *Cryptantha clevelandii* var. *florosa*. Photos of collection SCMV3199-2 were posted on iNaturalist (observation 289279293) and that identification was questioned there by botanist David Gowen (Photo Set F4). *Cryptantha* expert Mike Simpson was then brought in for his opinion, and he suggested that this may be an undescribed taxon. Duplicates of these two specimens were given to Mike Simpson for further assessment and DNA sequencing. Keir Morse and Mike Simpson intend to make more field collections and observations in summer of 2026 to better determine the identification of these specimens and to collect data for the description of a new taxon if warranted.

The two collections are from different habitats. SCMV3198-3 was collected from a sunny, sandy flat dominated by Lessingia tenuis. SCMV3199-2 was collected from an open, badland-like area with silt loam soil codominated by *Eriogonum kennedyi* var. *kennedyi* and what may be *Artemisia nova* (See Appendix F1)

PHOTO SET F4. *CRYPTANTHA* SP. NEAR SAN GUILLERMO MOUNTAIN IN VENTURA COUNTY (6/5/2025).

APPENDIX G. EXAMPLE DATASHEET SHOWING OVERLAP MATH

Combined Vegetation Rapid Assessment and Relevé Field Form
(Revised August 23, 2022)

Database #: QUAG0163 **SPECIES SHEET** **Recorder & Date:** K. Morse 3/10/26

IV. VEGETATION DESCRIPTION

% NonVasc cover: + **Total % Vasc Veg cover:** 43

% Cover - **Conifer tree / Hardwood tree:** 0 / 19 **Regenerating Tree:** 6 **Shrub:** 29 **Herbaceous:** 3

Height Class - Conifer tree / Hardwood tree: N/A / 7 **Regenerating Tree:** 4 **Shrub:** 4 **Herbaceous:** 2

Height classes: 1=<1/2m, 2=1/2-1m, 3=1-2m, 4=2-5m, 5=5-10m, 6=10-15m, 7=15-20m, 8=20-35m, 9=35-50m, 10=>50m

Stratum categories: T=Tree, A = SApling, E = SEedling, S = Shrub, H= Herb, N= Non-vascular
% Cover Intervals for reference: r = trace, + = <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%

Stratum	Species	% cover	C	Final species determination
T	Quercus agrifolia var. agrifolia	10		% cover column to left accounts for all overlap
A	Quercus agrifolia var. agrifolia	2		for each taxon by stratum. For example, there
E	Quercus agrifolia var. agrifolia	1		may be overlap in the Quercus agrifola tree
T	Platanus racemosa	12		stratum, but it is accounted for in the 10%.
A	Platanus racemosa	3		
E	Platanus racemosa	1		
T	Salix laevigata	4		
S	Salix lasiolepis	20		
S	Baccharis salicifolia	8		
S	Salix exigua	2		
H	Artemisia douglasiana	2		
H	Polypogon monspeliensis	+(0.5)		
H	Erythranthe guttata	+(0.4)		
H	Crassula connata	r(0.1)		
H	Polypogon viridis	r(0.01)		
N	Moss on rocks	+(0.2)		
	T (Hardwood Tree)			T on T overlap = 5
				10 + 12 + 4 = 26 - 5 overlap = 19% Tree Cover
	A+E (Regenerating Tree)			A+E overlap = 1 between Platanus A and E layers
				2 + 1 + 3 + 1 = 7 - 1 overlap = 6% Regen Tree Cover
	S (Shrub)			S on S overlap = 1
				20 + 8 + 2 = 30 - 1 overlap = 29% Shrub Cover
	H (Herb)			H on H overlap = 0
				2 + 0.5 + 0.4 + 0.1 + 0.01 = 3.01 = 3% Herb Cover
	Tree on Tree Regen overlap = 4			19 + 6 = 25 - 4 overlap = 21% all trees
	All tree on shrubs overlap = 10			21 all trees + 29 shrubs = 50 - 10 overlap = 40% T&S
	T&S on Herb overlap = 0.2			40 T&S + 3 H = 43 - 0.2 overlap = 42.8 = 43%
				Total % Vasc Veg Cover = 43%

Unusual species: _____

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