Vegetation Alliances of Western Riverside County, California

By

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INTRODUCTION

The California Department of Fish and Game (CDFG) contracted with the California Native Plant Society (CNPS) and Aerial Information Systems (AIS) to produce an alliance-level vegetation classification and map of Western Riverside County, California. The resulting classification and map products will be used to help establish a monitoring basis for the vegetation and habitats of the Western Riverside County Multi-Species Habitat Conservation Plan (MSHCP). The plan aims to conserve over 500,000 acres of land out of the 1.26 million acre total. This area is the largest MSHCP ever attempted and is an integral piece of the network of Southern California Habitat Conservation Plans and Natural Community Conservation Planning (Dudek 2001, Dudek 2003).

Riverside County is one of the fastest growing counties in California, as well as one of the most biodiverse counties in the United States. A wide array of habitats are found within the non-developed lands in Western Riverside County, including coastal sage scrub, vernal pools, montane coniferous forest, chaparral, foothill woodland, annual grassland, and desert.

In the CNPS contract, vegetation resources were assessed quantitatively through field surveys, data analysis, and final vegetation classification. Field survey data were analyzed statistically to come up with a floristically-based classification. Each vegetation type sampled was classified according to the National Vegetation Classification System to the alliance level (and association level if possible). The vegetation alliances were described floristically and environmentally in standard descriptions, and a final key was produced to differentiate among 101 alliances, 169 associations, and 3 unique stands.

In a parallel but separate effort by AIS, vegetation mapping was undertaken through interpretation of ortho-rectified, aerial photographs for vegetation signatures in color infrared (CIR) and in natural color (imagery flown in winter or summer). A detailed map has been produced through the following process: 1) hand-delineation of polygons on base CIR imagery, 2) digitization of polygons, and 3) attribution of the vegetation types and overstory cover values. The map was created in a Geographic Information System (GIS) digital format, as was the database of field surveys. It should be noted that, while the mapping effort occurred in tandem with the vegetation classification effort, the map was created under a separate contract and is not included nor described in this report.

Previous efforts to describe the vegetation of Western Riverside County focused primarily on mapping habitats with little or no field data collection. The map used to prepare the MSHCP mapping categories was created by PSBS and KTU+A (1995) and was based on maps and classifications created prior to 1995 (Holland 1986, Minnich 1990, Wieslander 1935). The map was derived from a variety of coarse-scale sources and was not developed from quantitative field data; thus, the resulting map has inconsistent map units and is too general to identify unique vegetation, define sensitive species habitat, and map vegetation at a fine scale.

The goal of the joint CDFG/CNPS/AIS study was to define and describe the vegetation types in Western Riverside County and to provide data for future management of the plant communities. A main objective of this project was to create a detailed, alliance level classification using standardized field sampling methodologies. The classification, database, and map may be used to monitor and inventory the vegetation and habitat of the core 510,000 acres, as well as additional lands that have not undergone development. The combination of these products provides a baseline dataset with floristic and ecological detail and, thus, will help drive management over time and make conservation decisions in Western Riverside County.

METHODS

Study area

Western Riverside County encompasses 1.26 million acres of land. This study area includes areas within the western portion of Riverside County that are not developed or used for agriculture. The western boundary of the study area includes the portion of the eastern slope of the Santa Ana Mountains that occurs in Riverside County. The eastern boundary of the study area includes the southwestern

corner of the San Gorgonio Mountains, the eastern slope of the San Jacinto Mountains, and the area west of the intersection of Highway-74 and Highway-79. See Figure 1.

The project area was divided into six ecologically defined subregions that were treated as separate units for field sampling and for mapping. The subregions vary both environmentally and floristically, include unique compliments of vegetation, and are consistent with the Forest Service ecological subsections of Southern California Mountains and Valleys (Miles and Goudey 1997). Figure 1 depicts the ecological subsections included in the study. Six main ecological subregions were defined as follows:

1. *San Jacinto Foothills and Cahuilla Mountains* (M262BI): Occurs on lower mountain slopes, moderately steep to steep hills, and nearly level to level alluvial plains. The climate is hot to temperate and subhumid, with a mean annual precipitation of about 10 to 20 inches, most of it rain. The mean annual temperature is around 50 – 60 degrees Fahrenheit and the elevation ranges from 1,500 to 4,000 feet.
2. *Santa Ana Mountains* (M262Bf): Occurs on some rolling plateau surfaces and on steep to very steep mountains with narrow to rounded summits and narrow canyons. The climate is hot and subhumid and the mean annual precipitation is about 15 to 25 inches, most of it rain. The mean annual temperature is about 45 to 62 degrees Fahrenheit and the elevation ranges from 300 feet to 5,687 feet.
3. *Perris Valley and Hills* (M262Bk): Occurs on moderately steep to steep hills and valleys. The climate is hot and the mean annual precipitation is about 10 to 16 inches, most of it rain. The mean annual temperature is about 58 to 64 degrees Fahrenheit and the elevation ranges from 1,400 to 2,600 feet.
4. *Fontana Plain – Calimesa terraces* (M262Bj): Occurs on very gently to gently sloping alluvial fans and basin floor. The climate is hot and subhumid with a mean annual precipitation of around 12 to 20 inches, most of it rain. The mean annual temperature is about 62 to 64 degrees Fahrenheit and the elevation ranges from 600 to 2,400 feet.
5. *San Jacinto Mountains* (M262Bm): Occurs on steep to very steep mountains with narrow to rounded ridges and narrow canyons. The climate is temperate to cold and subhumid with a mean annual precipitation of around 16 to 30 inches, mostly rain at lower elevations and mostly snow at higher elevations. The mean annual temperature is about 40 to 58 degrees Fahrenheit and the elevation ranges from about 3,000 to 10,831 feet.
6. *San Gorgonio Mountain*s (M262Bg): This section comprises the lower parts of the San Bernardino Mountains and occurs on steep and very steep mountains with narrow to rounded summits and narrow canyons. The climate is hot to temperate and subhumid, with a mean annual precipitation of around 20 to 30 inches, most of it rain at the lower elevations. The mean annual temperature is about 45 to 60 degrees Fahrenheit and the elevation ranges from 1,500 to 6,000 feet.

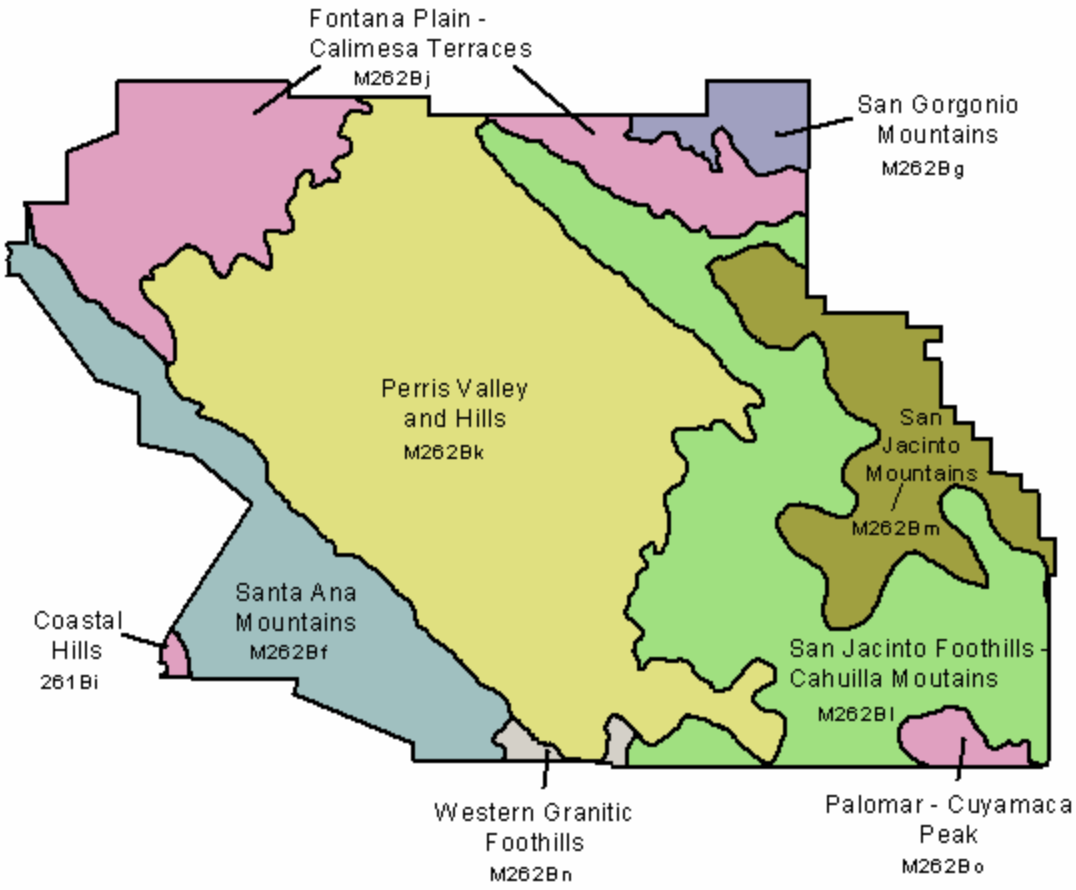
Grasslands, forblands, shrublands, forests and woodlands occur in all six subregions, and vernal pools occur in the Santa Ana Mountains and the Perris Valley and Hills Subsections.

Portions of three other subsections are found within Western Riverside County, but they were not treated as separate units because of their small size. Each of these three subsections was subsumed into one of the six above ecological subsections for sampling and mapping. They were treated as follows:

1. *Coastal Hills Subsection* (261Bi): Treated within Santa Ana Mountains Subsection (M262Bf).
2. *Western Granitic Foothills* (M262Bn): Treated within Perris Valley and Hills Subsection (M262Bk).
3. *Palomar – Cuyamaca Peak Subsection* (M262Bo). Treated within San Jacinto Foothills and Cahuilla Mountains Subsection (M262Bm).

Figure 1. Study area in Western Riverside County within Southern California, showing ecological subsections. The subsections in the inset are consistent with the US Forest Service ecological subregions (Miles and Goudey 1997) and are separated by thick black lines.

Inset of Western Riverside County



Sampling

The majority of land across the 1.26 million acreage total in Western Riverside County is in private ownership. Approximately 357,000 acres of land in the county are accessible to the public and are known as public/quasi-public (PQP) lands per Dudek (2001). PQP lands are owned by agencies such as The U.S. Forest Service, U.S. Bureau of Land Management, University of California, County Reserves, City and County Parks, Department of Fish and Game, The Nature Conservancy, Parks and Recreation, and the State Land Commission (UCB and CCB 2005). Other lands include those owned by the Bureau of Indian Affairs and by the military. Field sampling occurred on PQP lands primarily, and on private and Indian lands, where permission was granted. Private lands also were surveyed from public roads, using binoculars and digital rangefinders.

A preliminary vegetation classification was developed to drive allocation of sampling. It included information from state and local classifications and from reconnaissance of the study area. A preliminary reconnaissance occurred in mid-July, 2002, with staff from AIS, CDFG, and University of California, Riverside (UCR).

After the first reconnaissance, the field effort focused on capturing representative samples of the tree, shrub, and herb types in the preliminary classification. Sampling sites were selected by subjectively determining stand homogeneity and by using stratified random sampling. The emphasis in sampling was to obtain as many replicate samples for as many vegetation types as time and resources allowed. The photo-interpreters and the field staff tackled each of the six subregions, one by one, in a feedback loop. This allowed the photo-interpreters to create preliminary vegetation maps in predetermined sections of the county, which were used by the field crews during sampling. Then data from the field crews were supplied back to the photo-interpreters. In addition, sampling time within each subregion was determined by prioritizing plant phenology and vegetation detectibility. For example, subsections with an abundance of herbaceous vegetation were sampled during the spring, and subsections with mostly montane coniferous vegetation were sampled in the summer.

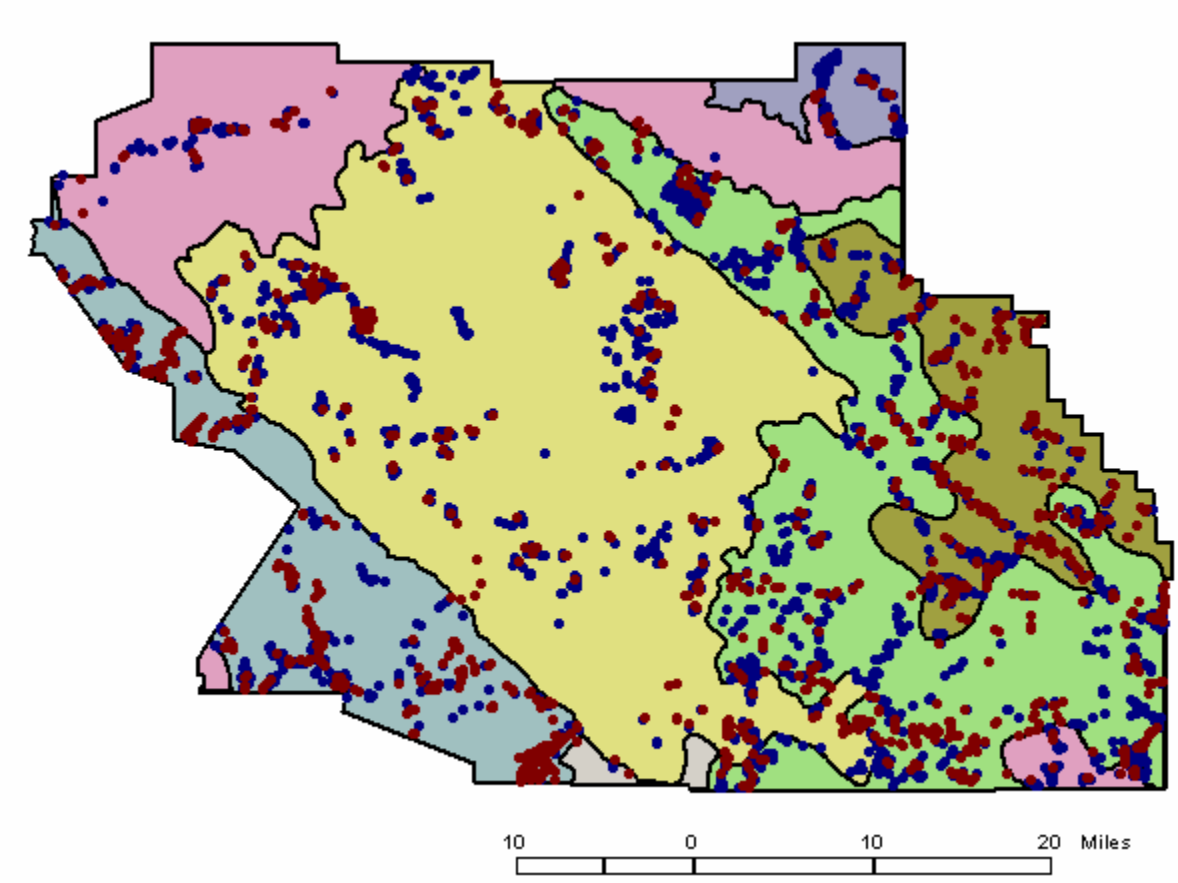
For the stratified sampling design, AIS and CDFG worked collaboratively on generating a gradient directed transect (GRADSECT) analysis. The analysis is based on the distribution of patterns along environmental gradients and is intended to provide a description of the full range of vegetation patterning in a region by sampling along the full range of environmental variability (TNC and ESRI 1994). The project's gradsect analysis stratified the region into unique biophysical units using five environmental layers that were thought to control vegetation patterns: January minimum temperature, July maximum temperature, ranked aspect with ranked slope, winter precipitation, and geology. After analysis of these environmental layers, 389 unique combinations of biophysical units resulted; 309 were on public lands and available for sampling. These units were targeted for random sampling with the assumption that unique vegetation types occur at locations of the different biophysical units.

Anne Klein, Vegetation Ecologist with CNPS, and Kirsten Larsen, Vegetation Assistant with the University of California at Riverside, conducted the majority of field sampling from mid-July 2002 to mid-August 2003. Joanna Lemly and Justin West, Vegetation Assistants with University of California at Davis, joined the field team to collect more surveys during peak plant phenology (mid-March to mid-June 2003). Lemly and West assisted in surveying the subregions that had not been sampled yet and in conducting additional surveys across all six subregions. Other CNPS and CDFG staff, Julie Evens and Todd Keeler-Wolf, assisted the field staff and mapping staff during four separate visits to the study area. During these visits, Evens and Keeler-Wolf trained the field staff and participated in field reconnaissance.

The CNPS Rapid Assessment protocol was used to collect vegetation samples for classifying and describing the vegetation (see Appendix 1). Rapid assessments also were collected to test the accuracy of the final mapping effort (see accuracy assessment section). Additionally, quick reconnaissance surveys were collected. These surveys contained shortened versions of the rapid assessment method to assist the mappers in adequately interpreting signatures of stands. Figure 2 shows the point locations for rapid assessment and reconnaissance.

The Rapid Assessment protocol is a concise methodology for collecting the salient vegetation and environmental features across an entire stand or polygon of vegetation (not just the confined plot boundary). Each assessment takes about 30 minutes to complete. The survey size varies depending

Figure 2. Locations of field surveys within Western Riverside County. The Vegetation Rapid Assessment survey locations are maroon dots, and the reconnaissance points are blue dots. The colored backdrop and thick black lines depict the US Forest Service Ecological Subsections.



on the size of the stand and the accessibility of the entire stand, and thus can be less than 1 acre or greater than 5 acres in size. The methodology is used to maximize the number of surveys that can be collected across a large area, especially when time and funding are limited. While the rapid assessment is useful in providing general species information for alliance level classifications, it is restricted in its ability to provide detailed species information for association level classifications. The species list is restricted to around 20 entries or less and, thus, is not well suited for defining highly diverse stands of vegetation.

The Rapid Assessment approach was selected for this project given time and funding constraints, the focus on creating an alliance level classification, and the unseasonably warm and dry climate conditions from September 2002 to August 2003. In total, a greater number of rapid assessments were collected in woody-dominated stands versus herbaceous-dominated stands where species diversity and seasonal shifts in composition are difficult to capture during warm and dry years. More detailed protocols, such as the CNPS relevé and transect methodologies, are better suited for defining herbaceous plant communities.

With the Rapid Assessment protocol, data were collected on homogeneous "stands" of vegetation, which were identified by locating areas of homogeneous species composition, species abundance, and site history. For each stand identified, a list of tree, shrub, and/or herb species was recorded. On average each rapid assessment list contained 12 native species and additional non-native species. Each species was designated a height stratum (low=<0.5 m, medium=>0.5 to 5 m, and tall=>5 m), and the abundance or percent cover of each species was assessed by estimating the percentage of ground area covered by living parts. Sometimes, species were identified in more than one stratum (e.g., *Quercus engelmannii* could be found in the low, medium, and tall layers). In these instances, percent cover was estimated separately for each stratum that the species occurred in. All percent cover estimates were transformed into ranked categories similar to the Braun-Blanquet (1932/1951) system for the data analysis. The categories are as follows: 1=<1%, 2=1-5%, 3=>5-15%, 4=>15-25%, 5=>25-50%, 6=>50-75%, 7=>75%.

All survey locations were recorded using global positioning system (GPS) receivers in Universal Transverse Mercator (UTM) and North American 1983 datum. One GPS location was recorded within a representative location of each rapid assessment survey. When private lands were surveyed from public roads, GPS locations were collected from the road. In these instances, digital rangefinders were used to measure the distance from the GPS location to the stand center, and compasses were used to collect the bearing from the GPS location to the stand center. More precise GPS locations were later calculated using both the bearing and GPS distance to the center of the stand. Standard sets of additional variables were collected as part of all field samples. These include altitude, degree aspect, degree slope, total vegetative cover, total overstory cover, total understory cover, geologic substrate, and soil texture.

Rapid assessment surveys were collected using paper forms and using digital forms stored in hand-held computers. The digital forms were developed by CDFG staff, using HanDBase (version 3.0) database software. Paper surveys were entered directly into an Access database created by CDFG, and the data in hand-held computers were uploaded into personal computers and transferred into the Access database where all the paper surveys were entered and stored.

Throughout the field season, unknown plant specimens were identified using the Jepson Manual (1993), Munz, other related keys, and local plant lists. Additionally, staff from the UCR herbarium and the Rancho Santa Botanic Gardens helped identify unknown plant specimens. From September 2002 to December 2003, all surveys were entered manually or digitally transferred into a standardized database. Quality accuracy and control were performed on the data during the fall of 2003. The information is archived in the MS Access database for Rapid Assessment surveys. All associated data survey information is located in the VEG_info, OBS_info, IMPACT_info, SPECIES_info, LOCATIONAL_info, PWI_info, and PHOTO_info tables. Other tables are look-up reference tables for the functionality of the forms and data tables. Reconnaissance survey information is located in a shapefile within the wr_recpt.dbf table.

Once all the data were digital, an involved process of developing a standardized, quantitative classification was performed. In the following paragraphs a detailed description of the processes and methods involved are described. In brief, the phases can be summarized as follows:

1. Accumulate existing literature and combine into preliminary classification of vegetation types.
2. Target the various vegetation types using current field sampling to capture all bio-environments in the study area and fill in the gaps in the existing classification.
3. Analyze new plots to develop quantitative classification rules.
4. Bring the classification into accordance with the standardized National Vegetation Classification System (NVCS).
5. Develop keys and descriptions to all the alliances of the mapping area.

Existing Literature Review

Beginning in early April 2003, information from a state California vegetation classification (Sawyer and Keeler-Wolf 1995), a recent classification for an adjacent area of southern California (CDFG 1998), and other existing literature were reviewed to obtain a current view of the local vegetation with respect to the National Vegetation Classification (Grossman et al. 1998). This information was compiled into a preliminary, floristic classification of vegetation at the alliance and association levels. Further, an initial reconnaissance of the study area in July 2002 supplemented this classification. The initial inventory included nearly 100 associations and suggested about 150 alliances in the mapping area.

Cluster analyses for vegetation classification

Following the 2002-2003 sampling effort by the field staff, the rapid assessment data were statistically analyzed. A team of ecologists classified the data, including Julie Evens and Anne Klein (CNPS), and Diana Hickson and Todd Keeler-Wolf (CDFG). The analysis was undertaken using the PC-ORD software suite of classification and ordination tools (McCune and Mefford 1997). PC-ORD performs multivariate analyses to generate order out of complex ecological patterns. It can be used to objectively define groups of samples into a formalized classification of community types. Using programs such as TWINSPAN (Hill 1979), Cluster Analysis and Ordination (McCune and Mefford 1997), groups are defined by similarities in species composition and abundance.

Since plant community datasets are inherently complex and more than one environmental axis determines the heterogeneity in plant patterns, a hierarchical agglomerative Cluster Analysis technique was employed with Sorenson distance and flexible beta linkage method at -0.25 (McCune and Grace 2002). The cluster analysis technique was based on abundance (cover) values converted to 7 different classes using the following modified Braun-Blanquet (1932/1951) cover categories: 1=<1%, 2=1-5%, 3=>5-15%, 4=>15-25%, 5=>25-50%, 6=>50-75%, 7=>75%. The majority of the species values fell within the first four cover classes.

Because of the size and heterogeneity of the initial dataset, a first-order cluster analysis was used to partition the dataset into more manageable subsets. The subsets were then reanalyzed using Cluster Analysis. This process is known as progressive fragmentation (Bridgewater 1989). The main cluster analysis dendrogram was produced from the full data set, and this was progressively broken into distinct, smaller subsets of around 100-200 samples in second and third-order cluster analyses. These smaller subsets were then individually analyzed. Subsets usually included distinctly different vegetation types or habitats. With individual small cluster analyses performed, dendrograms were produced that defined samples into a number of resulting groups (from 2 main group levels up to 20 finer group levels).

Prior to the separate cluster analysis runs, data were screened for outliers (extreme values of sample units or species), and they were removed to reduce heterogeneity and increase normality in the dataset. Samples that were more than three standard deviations away from the mean were removed using outlier analysis in PC-ORD, and species that were in fewer than three samples were removed.

After the Cluster Analysis runs, Indicator Species Analysis (ISA) was employed to decide objectively what group level to “cut” the dendrogram and explicitly interpret the groups. Further, ISA was used to designate which species indicate the different groups. ISA produced indicator values for each species in each of the groups within the dendrogram, and these species were tested for statistical significance using a Monte Carlo technique (Dufrene and Legendre 1997). ISA was repeated at successive group levels from the 2 main groups of the dendrogram on up to more than 20 groups (i.e.,

the maximum number of groups allowable, where all groups have at least 2 samples per group). At each group level, the analysis was evaluated to obtain the total number of significant indicator species (p-value ≤0.5) within each group level and the mean p-value for all species. The group level that had the highest number of significant indicators and lowest overall mean p-value was selected for the final evaluations of the community classification (McCune and Grace 2002). At this grouping level, plant community names within floristic classes were applied to the samples of the different groups.

Each sample was revisited within the context of the cluster to which it had been assigned to quantitatively define membership rules for each association. The membership rules were defined by species constancy, indicator species, and species cover values. Upon revisiting each sample, a few samples were misclassified in earlier fusions of the cluster analysis, and these samples were reclassified based on the membership rules. The set of data collected throughout the study area was used as the principal means for defining the association composition and membership rules; however, existing classifications and floras were consulted to locate analogous/similar classifications or descriptions of vegetation. A summary of the analysis process is provided in the following steps:

1. Screen all sample-by-species data for outliers. Samples that were more than three standard deviations away from the mean were removed, and species that were in fewer than three samples were removed.
2. Run presence-absence Cluster Analysis to determine general arrangement of samples.
3. Run cover category Cluster Analysis to display a more specific arrangement of samples based on species abundance as well as presence.
4. Run Indicator Species Analysis at each of the successive group levels in the Cluster Analysis output, from 2 groups up to the maximum number of groups (all groups have at least 2 samples).
5. Settle on the final representative grouping level of each Cluster Analysis to use in the preliminary labeling.
6. Preliminarily label alliance and association for each of the samples, and denote indicator species from the Indicator Species Analysis.
7. Develop decision rules for each association and alliance based on most conservative group membership possibilities based on review of species cover on a sample-by-sample basis.
8. Re-label final alliance labels for each sample and arrange in table of database.
9. Use decision rules developed in the new data to assign alliance and association names to all analyzed data and all outlier samples removed from dataset.

Some rare vegetation types were under-represented in the sampling effort. They were often the only representatives of rare alliances known from areas within the study boundaries, or they were the only representatives of alliances that occur in other areas beyond the study boundaries in California. Additionally, it was not possible to survey the full spectrum of vegetation because of unseasonably warm and dry climate conditions, limited time, and difficultly in accessing lands under private ownership. For these reasons, adequate data may not be available in this report for all vegetation types. However, any relatively unique samples are considered important and are described separately in the results. In some cases, they represent unusual species groupings here-to-fore undescribed and were viewed as affording perspective into unusual vegetation types that deserve additional sampling. These types are either described at a more generic alliance/habitat level or as unique stands.

Classification and Key

The classification and key were produced to identify all vegetation types detected in the fieldwork for this project. They are based on the standard floristic hierarchy of the U.S. National Vegetation Classification as supported by NatureServe (see www.natureserve.org or NatureServe 2005). They are based on species composition, abundance, and habitat/environment.

Naming conventions followed the floristic units of “alliances”, (and “associations” when possible) as defined by the National Vegetation Classification System (Grossman et al. 1998) and the California Native Plant Society (Sawyer and Keeler-Wolf 1995). An “alliance” is the generic floristic unit in the classification. It is based on a group of samples that exhibit the same dominant (or diagnostic) species, which is usually in the uppermost height stratum. For example, the Engelmann Oak Alliance is

recognized by the characteristic presence of that oak species in the overstory, which occurs in portions of the South Coast and Transverse and Peninsular Ranges.

Whereas alliances are the generic units of vegetation, associations are subdivisions of alliances based on constant patterns of additional species within an overall pattern of alliance dominance. For example, different types of Engelmann oak woodland are classified to the association level depending on the characteristic overstory and understory species (e.g., Engelmann oak/Scrub oak as opposed to Engelmann oak/Poison oak/grass). An association is the most basic fundamental unit of classification, and it is defined by a group of samples that have similar dominant and characteristic species in the overstory and other important and indicator species in the overstory and/or understory. Associations are typically geographically more specific than alliances, and they tend to be locally distributed and indicative of a certain environment or ecosystem in a local setting. In the naming of associations or alliances, species in the uppermost stratum are listed first, and additional species differing in strata are separated with a slash (*e.g. Quercus engelmannii*/*Toxicodendron diversilobum*), while species in the same stratum are separated with a dash (*e.g. Quercus engelmannii-Quercus agrifolia)*.

To differentiate types in the classification, a key to the alliances and associations is provided. The key provides general choices and information on the physiognomy of the vegetation and the different environments based on wetland/upland position. This approach in the key was chosen: 1) to reduce the length and redundancy that is common in dichotomous keys, and 2) to be a guide that can be easily used by non-botanists/plant ecologists. The vegetation key can be used as a stand-alone product, allowing anyone with some basic ecology background and knowledge of the main characteristic plant species to identify the vegetation. It is written from two perspectives: (1) a field team attempting to identify vegetation and (2) an office team attempting to place field samples into the proper category. Thus, heavy reliance is placed on correct identification of characteristic plant species and of estimation of cover of these species.

The key is first broken into major units based on dominant plant life-form: trees, shrubs and herbs. Within these groups, it is further divided by coniferous/broadleaf evergreen, chaparral/soft-leaved shrubs, wetland/upland distinctions, graminoid/forb distinctions, etc. The key and descriptions hopefully will afford further refinement to the understanding of the Western Riverside area and surrounding regions, from the standpoint of both classification and mapping.

Description Writing

Following the analysis of field data and development of the classification and key, brief alliance-level descriptions were written and based on field data and available literature. Scientific names of plants follow Hickman (1993) and UCB (2004). Common names follow these sources and USDA (2004). The primary writers were Anne Klein and Julie Evens (California Native Plant Society). Todd Keeler–Wolf (California Department of Fish and Game) reviewed and edited the descriptions. Brief reviews and commentary were also provided by David Bramlet, Ileene Anderson, and Fred Roberts. When writing the descriptions, the following standards were set:

1. **Dominant or co-dominant species**: Must be in at least 80 percent of the samples, with at least 30 percent relative cover in all samples.
2. **Consistent/Characteristic/Diagnostic species**: Must be present in at least 80 percent of the samples, with no restriction on cover.
3. **Abundant species**: Must be present in at least 50 percent of the samples, with an average of at least 30 percent relative cover in all samples.
4. **Frequently/often/ usually occurring species**: Must be present in at least 50 percent of the samples, with no restriction on cover.
5. **Infrequently occurring**: present in less than 25 percent of the samples.
6. **Minimum sample size for classification and description**: n = 3. Descriptions of alliances with fewer than three samples were attempted if (a) the alliance was sampled and described by previous authors or (b) the vegetation was confirmed as distinctive and repeatable based on field reconnaissance or by photo-interpretation signature.
7. **Open**: Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where the cover is generally less than 33 percent absolute cover.

8. **Intermittent**: Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where there is 33-66 percent absolute cover.
9. **Continuous**: Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where there is greater than 66 percent absolute cover.
10. **Relative cover**: Refers to the amount of the surface of the plot or stand sampled that is covered by one species (or physiognomic group) as compared to (relative to) the amount of surface of the plot or stand covered by all species (in that group). Thus, 50 percent relative cover means that half of the total cover of all species or physiognomic groups is composed of the single species or group in question. Relative cover values are proportional numbers and, if added, total 100 percent for each stand (sample).
11. **Absolute cover:** Refers to the actual percentage of the ground (surface of the plot or stand) that is covered by a species or group of species. For example, *Pinus jeffreyi* covers between 5 percent and 10 percent of the stand. Absolute cover of all species or groups if added in a stand or plot may total greater or less than 100 percent because it is not a proportional number.
12. **Stand:** Is the basic physical unit of vegetation in a landscape. It has no set size. Some vegetation stands are very small such as wetland seeps, and some may be several square kilometers in size such as desert or forest types. A stand is defined by two main unifying characteristics:
    A. 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 gradual.
    B. It has *structural* integrity. It has a similar history or environmental setting, affording relatively similar horizontal and vertical spacing of plant species. For example, a hillside forest formerly dominated by the same species, but that has burned on the upper part of the slope and not the lower is divided into two stands. Likewise, a sparse woodland occupying a slope with shallow rocky soils is considered a different stand from an adjacent slope of a denser woodland/forest with deep moister soil and the same species.
13. **Woody plant:** Is any species of plant that has noticeably woody stems. It does not include herbaceous species with woody underground portions such as tubers, roots, or rhizomes.
14. **Tree:** Is a one-stemmed woody plant that normally grows to be greater than 5 meters tall.
15. **Shrub:** Is normally a multi-stemmed woody plant that is usually between 0.2 meters and 5 meters tall. Definitions are blurred at the low and the high ends of the height scales.
16. **Herbaceous plant:** Is any species of plant that has no main woody stem-development, and includes grasses, forbs, and perennial species that die-back seasonally.
17. **Forest:** In the National Vegetation Classification, a forest is defined as a tree-dominated stand of vegetation with 60 percent or greater cover of trees.
18. **Woodland:** In the National Vegetation Classification, a woodland is defined as a tree-dominated stand of vegetation with between 25 percent and 60 percent cover of trees.
19. **Sparsely wooded:** There are stands with trees conspicuous (generally at least 10% absolute cover), but less than 25 percent cover may occur over shrubs as the dominant canopy (sparsely wooded shrubland) or herbaceous cover (sparsely wooded herbaceous).
20. **Rare and endangered plants:** Listed as per CNPS (2005) Online Inventory of Rare and Endangered Plants.
21. **Conservation rank**: Listed by the state Nature Conservancy Heritage Programs. All communities were ranked, though ones without much information were ranked with a "?" after the rank to denote that this rank may change with more information, but that the best knowledge to date (sometimes personal) was used in these situations. Otherwise, hard references were used to place rank. These ranks are the "Global" and "State" ranks as seen below:
    a. **G1** and **S1**: Fewer than 6 viable occurrences worldwide and/or 2000 acres.
    b. **G2** and **S2**: 6-20 viable occurrences worldwide and/or 2000-10,000 acres.
    c. **G3** and **S3**: 21-100 viable occurrences worldwide and/or 10,000-50,000 acres.
    d. **G4** and **S4**: Greater than 100 viable occurrences worldwide and/or greater than 50,000 acres.
22. **Sample(s)**: Listed by their survey numbers from the vegetation databases, and indicated using the following: Rapid Assessments begin with the alpha-code "WRIV" (an abbreviation of Western Riverside), Accuracy Assessments begin with the alpha-code "WRAA" (an abbreviation for Western Riverside Accuracy Assessment, and Reconnaissance surveys begin with the alpha-code "RECN". Successive numeric codes follow each of the alpha-prefixes.

23. **Con, Avg, Min, Max:** A species table is provided at the end of each alliance description. The **Con** column provides the overall constancy value for each species within all rapid assessments classified as that alliance. The constancy values are between 0 and 100. Trees and shrubs that occurred with at least 20% constancy and herbs that occurred with at least 15% constancy are listed in the table. The **Avg** column provides the average cover value for each species, as calculated across all samples in that alliance. The **Min** and **Max** values denote the minimum and maximum cover values of a species when it was present in the samples.

RESULTS

A total of 1203 rapid assessment surveys were collected in Western Riverside County from September 2002 to August 2003. This included 1035 rapid assessments that were provided to the photo-interpreters, and 168 additional rapid assessments that were used for assessing accuracy of the map. Of these surveys, 566 were collected using paper forms and 637 were collected using digital forms stored in hand-held computers. Additionally, the field crews performed approximately 3,540 reconnaissance surveys that were provided to the photo-interpreters, and 35 additional surveys that were used for accuracy assessment of the map.

The rapid assessments included 631 vascular plant taxa which were usually identified to the species, subspecies, or variety levels. Generic names were used when vascular plant species were not identified to species and four general names were given to non-vascular taxa (i.e., Cryptogamic crust, Moss, Lichen, and Liverwort). Appendix 2 provides a complete list of scientific and common names for all taxa identified and analyzed in the vegetation surveys. Scientific names of the taxa were converted to alpha-numeric codes for data analyses, as recorded in the appendix. Further, each hardwood and conifer tree species was given an alpha-numeric code with three different endings based on the three different height strata where the species occurred. Tree species sampled in the tall stratum have an alpha-numeric code ending in "-t", those sampled in a medium stratum have a code ending in "-m", and those sampled in a low stratum have a code ending in "-l" (e.g., *Quercus agrifolia* sampled in tall and low strata are coded "QUAG-t" and "QUAG-l", respectively). Records of all taxa were reviewed before the analyses, and groups of taxa that were inconsistently identified to species and genus levels were subsumed into a general name (e.g., *Erodium* sp., *Erodium botrys*, *E. brachycarpum*, and *E. moschatum* were merged into *Erodium)* for the analysis.

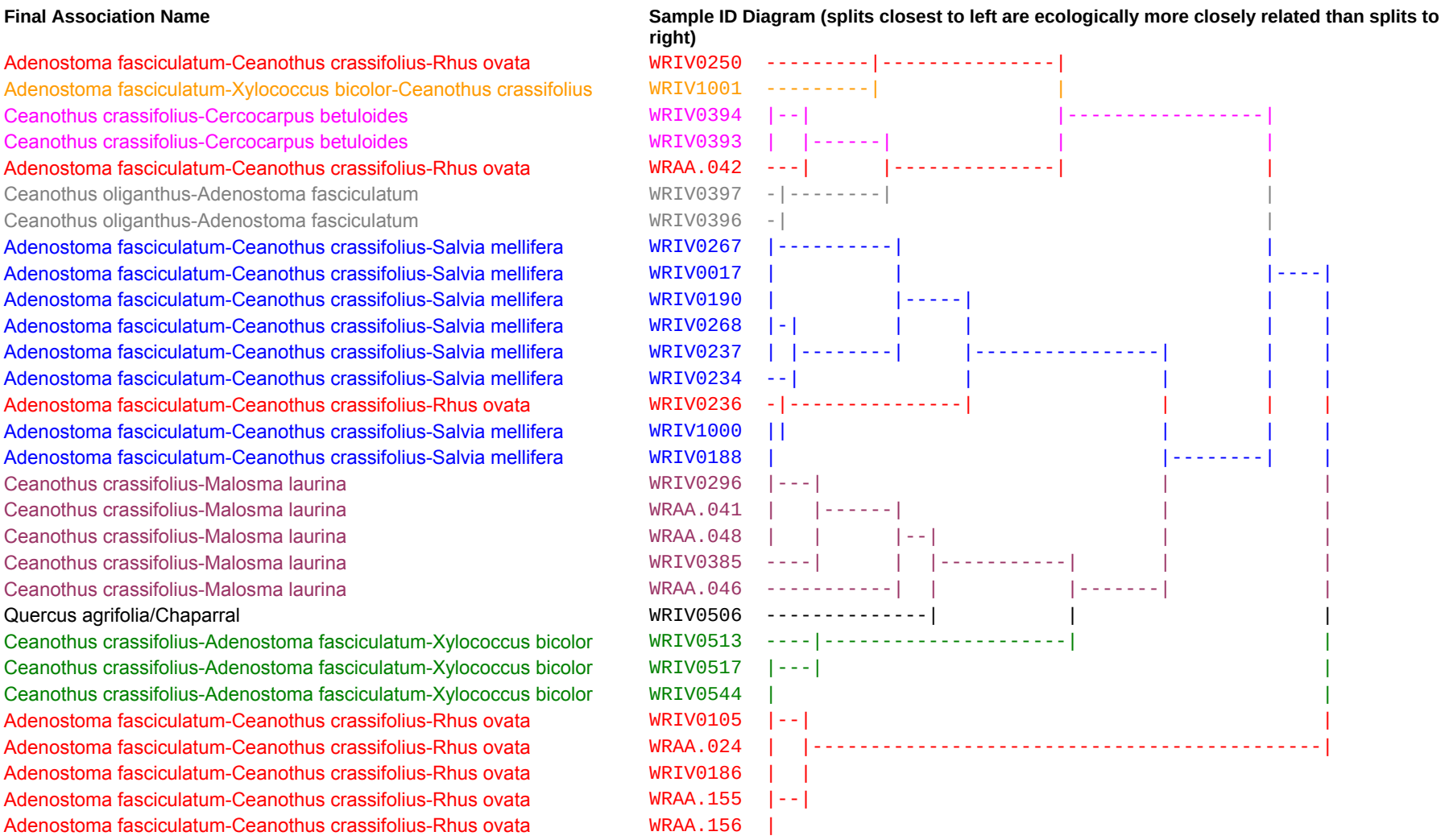
Initial cluster analyses were produced for the 1203 surveys, which included data on 261 tree-overstory stands, 894 shrub-overstory stands, and 48 herbaceous stands. In producing the first cluster analysis run with species presence-absence values and the second run with species abundance values, the full dataset was broken up into three groups (A, B, and C) and analyzed with Indicator Species Analysis. The three main groups are summarized as follows: **Group A)** 296 plots with indicators such as *Salix lasiolepis*, *Baccharis salicifolia*, *Salix laevigata*, *Quercus chrysolepis*, *Populus fremontii*, *Platanus racemosa*; **Group B)** 440 plots with indicators such as *Eriogonum fasciculatum*, *Artemisia californica*, *Bromus madritensis*, *Salvia apiana*, *Hirschfeldia incana*, *Encelia farinosa*; and **Group C)** 467 plots with indicators such as *Adenostoma fasciculatum*, *Cercocarpus betuloides*, *Quercus berberidifolia*, *Adenostoma sparsifolium*, *Ceanothus crassifolius*. Each of these three groups was analyzed further with second cluster analysis runs, which were divided into smaller cluster groups and analyzed with Indicator Species Analysis. Outlier analysis was performed on each of the three datasets and three plots were removed from Group B because they had standard deviations greater than 3.0. A range of 133 to 174 species were removed from each of the three groups to reduce noise within the data sets. The groups that were split out of groups A, B and C are summarized as follows:

- **Cluster groups in Group A – including riparian, oak, and high-elevation conifer vegetation**
    - 1) 110 plots with indicators such as *Salix lasiolepis*, *Baccharis salicifolia*, *Populus fremontii*, *Salix laevigata*, *Salix exigua*, *Salix gooddingii*;
    - 2) 78 plots with indicators such as *Quercus chrysolepis*, *Pinus coulteri*, *Quercus wislizeni*, *Pinus jeffreyi*, *Quercus kelloggii*, *Abies concolor*, *Calocedrus decurrens*; and
    - 3) 108 plots with indicators such as *Quercus agrifolia*, *Toxicodendron diversilobum*, *Avena barbata*, *Bromus diandrus*, *Quercus engelmannii*, and *Nassella pulchra*.

- **Cluster groups in Group B – including coastal sage, desert-transition, and grassland vegetation**
    - 1) 75 plots with indicators such as *Bromus madritensis*, *Bromus diandrus*, *Amsinckia menziesii*, *Hemizonia fasciculata*, *Juniperus californica*;
    - 2) 81 plots with indicators such as *Keckiella antirrhinoides*, *Eucrypta chrysanthemifolia*, *Marah macrocarpus*, *Heteromeles arbutifolia*;
    - 3) 63 plots with indicators such as *Encelia farinosa*, *Schismus barbatus*, *Cryptantha intermedia*, *Bebbia juncea*;
    - 4) 100 plots with indicators such as *Yucca schidigera*, *Opuntia parryi*, *Encelia actoni*, *Rhus ovata*, *Simmondsia chinensis*, *Artemisia tridentata*; and
    - 5) 118 plots with indicators such as *Salvia apiana*, *Malosma laurina*, *Artemisia californica*, and *Yucca whipplei*.
- **Cluster groups in Group C – including chaparral and higher-elevation shrubland vegetation**
    - 1) 63 plots with indicators such as *Artemisia tridentata*, *Gutierrezia sarothrae*, *Eriogonum fasciculatum*;
    - 2) 74 plots with indicators such as *Cercocarpus betuloides*, *Prunus ilicifolia*, *Quercus cornelius-mulleri*, *Pinus quadrifolia*;
    - 3) 88 plots with indicators such as *Adenostoma sparsifolium*, *Arctostaphylos glauca*, *Yucca schidigera*, *Ceanothus greggii*;
    - 4)127 plots with indicators such as *Salvia mellifera*, *Ceanothus crassifolius*, *Adenostoma fasciculatum*, *Rhus ovata*, *Xylococcus bicolor*;
    - 5) 81 plots with indicators such as *Quercus berberidifolia*, *Heteromeles arbutifolia*, *Rhamnus ilicifolia*, *Fraxinus dipetala*; and
    - 6) 34 plots with indicators such as *Arctostaphylos glandulosa*, *Pinus coulteri*, *Ceanothus leucodermis*, *Dendromecon rigida,* and *Quercus wislizeni*.

A total of fourteen final cluster analyses were produced, and the data were classified to the alliance level (and association level if possible). Outlier analysis was performed on each of the fourteen datasets before the surveys were classified, whereby a total of six outlier plots were removed from the datasets and a range of 32 to 122 species were removed from each of the fourteen datasets. See Figure 3 for a sample of the resulting dendrogram for the 127 plots in the fourth group of group C.

Figure 3. Example diagram from the cluster analysis showing the arrangement of a subset of chaparral surveys. Surveys are labeled with their final association names. Each colored group indicates a different association.



CLASSIFICATION

The final cluster analyses and Indicator Species Analyses substantiated 100 alliances, including 21 tree-dominated alliances, 64 shrub-dominated alliances, and 15 herbaceous-dominated alliances. The analyses also indicated the presence of three unique stands. Additionally, 169 associations were defined, including 47 tree-dominated associations, 113 shrub-dominated associations, and 9 herbaceous-dominated associations (see Table 1). While some alliances or unique stands may have little data available for floristic classification and description, they have been provisionally defined for three different reasons:

1) to be established as types *in situ* and compared to other areas where the plant community is more common,

2) to be represented as rare communities to be compared to other similar locations, especially the wetland associations, and

3) so future projects and vegetation inventories can benefit from the definitions in this project.

The alliance and association types included in the floristic classification are consistent with the mapping classification used to create the final vegetation map. The relationship among both classifications and the NVCS (NatureServe 2005) is shown in Table 1, whereby the alliances and associations are nested within the formation level of the NVCS. When possible, map polygons were attributed with types included in the floristic classification; however, broader mapping units were used when attribution at the alliance or association level was too difficult (these units are provided in Table 1).

By providing as much information as possible in the classification, key, and descriptions, it is hoped that future efforts may build upon this framework of vegetation classification in Western Riverside County. The data, floristic classification, and vegetation mapping in this project provides detailed information for a variety of future research and management efforts. While this project has attempted to create a more comprehensive understanding of the vegetation types in the study area, additional alliance and association characteristics could come out through further research after this project, especially with increased access to private lands.

Additional vegetation types not sampled in this project, but described either anecdotally or in other reports (Bramlet 1994a, Bramlet 1994b, Minnich 1976; Klein and Larsen, reconnaissance), are listed in Table 2. Further field data collection and statistical analysis are necessary to describe and confirm additional types before they can be folded into the classification system used in this study.

CROSSWALKS TO OTHER CLASSIFICATIONS

The term “crosswalk” is commonly used in vegetation classification and mapping, referring to the development of relationships between different classification systems. The need for crosswalks arises when there is more than one classification system in use for a given area. In this project, a crosswalk was produced in Appendix 4 that relates the principle state and national classification (c.f. Sawyer and Keeler-Wolf 1995) to the Wildlife Habitat Relationships (Mayer and Laudenslayer 1988), Holland (1986), and collapsed MSHCP (Dudek 2001) classifications.

As an aside, crosswalks are never exactly precise. Assuming that classifications arise independently, the meaning of one classification unit may not always encompass or be nested completely within the other classification unit(s) to which it is being related. Choices need to be made about those classification units that are partially included within two or more types of another classification system. For example, the Wildlife Habitat Relationships (WHR) classification unit of “freshwater emergent wetland” actually includes many vegetation alliances. Likewise, the National Vegetation Classification’s alliance of *Ceanothus cuneatus* can be partly in the Holland serpentine chaparral or buck brush chaparral.

The complexity and uncertainty of such relationships arise not only from independent evolution of classifications, but also from their imprecise definitions, without quantitative rules for proper interpretation. The best crosswalks are those that have been developed with a good understanding of the meaning and definitions of each classification system.

Table 1. Final floristic classification of Western Riverside County nested within the National Vegetation Classification System (NVCS) formation hierarchy and associated to the mapping classification and codes. Alliances (highlighted in gray) that currently exist in the NVCS were categorized into formations per NatureServe (2005); types not currently defined in the NVCS were designated to formations by conservatively relating them to similar types. "Map codes" were created for all alliances and associations in the related mapping project and "map unit codes" were created for mapping units (generalized types of alliances or mixed associations). The number of field surveys per alliance is indicated.

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
I. Forest							
I.A.6.N.b. Lowland or submontane winter-rain evergreen sclerophyllous forest							
	yes				*Eucalyptus* spp.	1130	0
		Quercus chrysolepis		1122			18
			Quercus chrysolepis	1133			
			Quercus chrysolepis-Pinus jeffreyi	1132			
			Quercus chrysolepis-Pseudotsuga macrocarpa	1131			
	yes				*Umbellularia californica*	111	0
I.A.8.N.b. Rounded-crowned temperate or subpolar needle-leaved evergreen forest							
	no	*Abies concolor-Calocedrus decurrens*		2230			2
			Abies concolor-Calocedrus decurrens-Pinus jeffreyi	2234			
	yes	*Abies concolor-Pinus lambertiana*		2202			4
			Abies concolor-Pinus lambertiana-Calocedrus decurrens-Quercus chrysolepis	2233			
			Abies concolor-Pinus lambertiana-Pinus jeffreyi	2236			
					Abies concolor-Pinus lambertiana-(*Calocedrus decurrens-Pinus jeffreyi*)	221	
	no	*Calocedrus decurrens*		2101			2
			Calocedrus decurrens-Quercus chrysolepis-Quercus kelloggii	2170			
I.A.8.N.c. Conical-crowned temperate or subpolar needle-leaved evergreen forest							
	yes	*Pseudotsuga macrocarpa*		2221			4
			Pseudotsuga macrocarpa-Quercus chrysolepis	2240		222	

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
I.B.2.N.b. Montane or boreal cold-deciduous forest							
	yes	*Quercus kelloggii*		3102			8
			Quercus kelloggii-Pinus coulteri/Arctostaphylos glandulosa	3141			
			Quercus kelloggii-Pinus coulteri/Arctostaphylos pringlei	3142			
I.B.2.N.d. Temporarily flooded cold-deciduous forest							
	yes	*Alnus rhombifolia*		3220			4
			Alnus rhombifolia-Platanus racemosa	3256			
II. Woodland							
II.A.4.N.a. Rounded-crowned temperate or subpolar needle-leaved evergreen woodland							
	yes	*Pinus attenuata*		2110			3
			Pinus attenuata/Arctostaphylos glandulosa	2146			
					Pinus attenuata-Pinus contorta-Abies concolor	218	
	yes	*Pinus contorta* subsp. *murrayana*		2115			1
	yes	*Pinus coulteri*		2121			13
			Pinus coulteri/Arctostaphylos glandulosa-Quercus wislizeni	2153			
			Pinus coulteri/Quercus wislizeni	2150			
					Pinus coulteri/Grass	214	
					Pinus coulteri-Pinus attenuata Plantation	210	
					Pinus coulteri-Quercus kelloggii	213	
	yes	*Pinus coulteri-Quercus chrysolepis*		2132		211	16
			Pinus coulteri-Quercus chrysolepis/Arctostaphylos pringlei	2152			

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
					Pinus sp.-Quercus chrysolepis OR *Pinus coulteri-Quercus chrysolepis*	212	
	yes	*Pinus flexilis*		2123			2
			Pinus flexilis-Pinus contorta/Chrysolepis sempervirens	2147			
	yes	*Pinus jeffreyi*					22
			Pinus jeffreyi	2121			
			Pinus jeffreyi/Artemisia tridentata/Penstemon centranthifolius	2142	*Pinus jeffreyi/Artemisia tridentata*	216	
			Pinus jeffreyi/Quercus palmeri	2144			
			Pinus jeffreyi/Quercus wislizeni	2143			
			Pinus jeffreyi-Abies concolor/Chrysolepis sempervirens	2149			
			Pinus jeffreyi-Quercus kelloggii	2141			
					Pinus jeffreyi/(*Quercus wislizeni-Quercus palmeri*)	215	
					Pinus jeffreyi-Quercus kelloggii-(*Pinus ponderosa-Pinus coulteri-Quercus chrysolepis*)	217	
	yes				*Pinus ponderosa*	2126	
	yes	*Pinus quadrifolia*		2127			2
			Pinus quadrifolia/Quercus cornelius-mulleri	2148			
II.A.4.N.b. Conical-crowned temperate or subpolar needle-leaved evergreen woodland							
	yes				*Abies concolor*	2220	
					Abies concolor-Pinus contorta	223	
					Abies concolor-Pinus jeffreyi/Chrysolepis sempervirens	220	
II.A.5.N.a. Sclerophyllous extremely xeromorphic evergreen woodland							
	yes	*Quercus agrifolia*		1201			46
			Quercus agrifolia/Annual Grass-Herb	1243			

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
			Quercus agrifolia/Chaparral	1239			
			Quercus agrifolia/*Toxicodendron diversilobum* Riparian	1238			
			Quercus agrifolia/ *Toxicodendron diversilobum*/Grass	1242			
			Quercus agrifolia-Platanus racemosa/*Toxicodendron diversilobum*	1237			
			Quercus agrifolia-Platanus racemosa-Salix laevigata	1236			
					Quercus agrifolia/Mesic Chaparral	120	
					Quercus agrifolia/ (*Toxicodendron diversilobum*)/Grass	122	
					Quercus agrifolia-Juglans californica/*Malosma laurina*-Coastal Sage Scrub	123	
					Quercus agrifolia-Platanus racemosa Riparian	121	
					Quercus chrysolepis-Quercus wislizeni-Quercus kelloggii	110	
	yes	*Quercus engelmannii*		3101			15
			Quercus engelmannii/*Quercus berberidifolia*	3132			
			Quercus engelmannii/*Toxicodendron diversilobum*/Grass	3144			
			Quercus engelmannii-Quercus agrifolia/*Artemisia californica*	3138			
			Quercus engelmannii-Quercus agrifolia/*Toxicodendron diversilobum*/Annual Grass-Herb	3143			
					Quercus engelmannii/ Annual Grass-Herb	313	
					Quercus engelmannii/Chaparral	311	

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
					Quercus engelmannii-Quercus agrifolia	314	
					Quercus engelmannii-Quercus agrifolia/ Toxicodendron diversilobum/Grass	312	
					Quercus engelmannii-Quercus agrifolia-Platanus racemosa Riparian	315	
					(*Quercus engelmannii-Quercus agrifolia*)/Chaparral-Coastal Sage Scrub	310	
	yes	*Quercus wislizeni*		1202	See *Quercus wislizeni* in shrubland section		
II.B.2.N.b. Temporarily flooded cold-deciduous woodland							
	yes	*Platanus racemosa*		3221			19
			Platanus racemosa/Annual Grass-Herb	3255			
			Platanus racemosa-Salix laevigata/*Salix lasiolepis-Baccharis salicifolia*	3248			
	no	*Platanus racemosa-Populus fremontii*		3232			16
			Platanus racemosa-Populus fremontii/*Salix lasiolepis*	3249			
			Platanus racemosa-Populus fremontii/*Salix lasiolepis-Salix exigua*/*Scirpus americanus*	3253			
	yes	*Populus fremontii*		3222			29
			Populus fremontii /*Baccharis salicifolia*	3241			
			Populus fremontii-Salix gooddingii/*Baccharis salicifolia*	3252			
			Populus fremontii-Salix laevigata	3236			
			Populus fremontii-Salix laevigata/*Salix lasiolepis*/*Baccharis salicifolia*	3251			
			Populus fremontii-Salix laevigata/*Salix lasiolepis*/*Vitis*	3250			

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
			girdiana				
					Populus fremontii-Platanus racemosa (*Salix* spp.)	322	
					Populus fremontii Upland	321	
					Populus fremontii-Salix spp.	323	
	yes	*Salix gooddingii*		3203			20
			Salix gooddingii	3254			
			Salix gooddingii/Baccharis salicifolia	3237			
			Salix gooddingii/Lepidium latifolium	3246			
			Salix gooddingii-Salix lucida-Populus fremontii	3247			
					Salix gooddingii-Salix lucida	320	
	yes	*Salix laevigata*		3202			15
			Salix laevigata/Salix lasiolepis/Artemisia douglasiana	3239			
					More than 2 species of Salix spp. with varying heights	3201	
					Salix lucida var. *lasiandra*	324	
					Salix spp.	325	
III. Shrubland							
III.A.2.N.c. Sclerophyllous temperate broad-leaved evergreen shrubland							
	yes	*Adenostoma fasciculatum*		4301			41
			Adenostoma fasciculatum Disturbance	4309			
			Adenostoma fasciculatum Pure	4330			
			Adenostoma fasciculatum-Arctostaphylos pringlei	4446			
			Adenostoma fasciculatum-Eriogonum fasciculatum	4372			
			Adenostoma fasciculatum-Eriogonum fasciculatum-Salvia apiana	4379			
			Adenostoma fasciculatum-Malosma laurina	4387			
					Adenostoma fasciculatum (dominant or co-dominant)	430	

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
					Adenostoma fasciculatum-Coastal Sage Scrub Disturbance	431	
					Adenostoma fasciculatum-Adenostoma sparsifolium	438	
					Adenostoma fasciculatum-Ceanothus leucodermis-Rhus ovata	450	
					Adenostoma fasciculatum-Ceanothus tomentosus-(*Ceanothus oliganthus-Quercus berberidifolia*)	452	
					Adenostoma fasciculatum-(*Quercus berberidifolia-Quercus engelmannii-Ceanothus tomentosus-Ceanothus crassifolius*-Coastal Sage Scrub)	453	
	no	*Adenostoma fasciculatum-Arctostaphylos glandulosa*		4302			19
			Adenostoma fasciculatum-Arctostaphylos glandulosa	4802			
			Adenostoma fasciculatum-Arctostaphylos glandulosa-Ceanothus crassifolius	4391			
			Adenostoma fasciculatum-Arctostaphylos glandulosa-Ceanothus leucodermis	4385			
					Adenostoma fasciculatum-Arctostaphylos glandulosa-(*Ceanothus leucodermis-Quercus wislizeni-Ceanothus crassifolius*)	432	
	no	*Adenostoma fasciculatum-Arctostaphylos glauca*		4328			10
			Adenostoma fasciculatum-Arctostaphylos glauca	4499			
			Adenostoma fasciculatum-Arctostaphylos glauca-Rhus ovata	4367			

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
					Adenostoma fasciculatum-Arctostaphylos glauca-(*Quercus berberidifolia-Rhus ovata*)	433	
	no	*Adenostoma fasciculatum-Ceanothus crassifolius*		4333			38
			Adenostoma fasciculatum-Ceanothus crassifolius-Rhus ovata	4442			
			Adenostoma fasciculatum-Ceanothus crassifolius-Salvia mellifera	4392			
					Adenostoma fasciculatum-Ceanothus crassifolius-(*Rhus ovata-Quercus berberidifolia-Salvia mellifera*)	434	
	no	*Adenostoma fasciculatum-Ceanothus cuneatus*		4307			3
	no	*Adenostoma fasciculatum-Ceanothus greggii*		4314			4
	no	*Adenostoma fasciculatum-Salvia apiana*		4304			11
			Adenostoma fasciculatum-Salvia apiana-Artemisia californica	4370			
	no	*Adenostoma fasciculatum-Salvia mellifera*		4303			26
			Adenostoma fasciculatum-Salvia mellifera	4800			
			Adenostoma fasciculatum-Salvia mellifera-Artemisia californica	4388			
			Adenostoma fasciculatum-Salvia mellifera-Ceanothus crassifolius	4368			
	no	*Adenostoma fasciculatum-Xylococcus bicolor*		4338			13

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
			Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus crassifolius	4431			
			Adenostoma fasciculatum-Xylococcus bicolor-Quercus berberidifolia	4488			
			Adenostoma fasciculatum-Xylococcus bicolor-Salvia mellifera-Malosma laurina	4443			
					Adenostoma fasciculatum-Xylococcus bicolor (*Ceanothus crassifolius-Salvia mellifera-Malosma laurina*)	435	
	no	*Adenostoma sparsifolium*		4401			18
			Adenostoma sparsifolium-Artemisia tridentata	4435			
			Adenostoma sparsifolium-Ceanothus crassifolius	4483			
			Adenostoma sparsifolium-Ceanothus cuneatus	4436			
			Adenostoma sparsifolium-Ericameria linearifolia-Eriogonum fasciculatum-Opuntia basilaris	4484			
			Adenostoma sparsifolium-Eriogonum fasciculatum-Lotus scoparius	4479			
	no	*Adenostoma sparsifolium-Adenostoma fasciculatum*		4402			49
			Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos glauca	4403			
			Adenostoma sparsifolium-Adenostoma fasciculatum-Opuntia parryi	4485			
					Adenostoma sparsifolium-Adenostoma fasciculatum- (*Arctostaphylos glauca-Opuntia parryi*)	436	

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
			Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos pungens	4482			
			Adenostoma sparsifolium-Adenostoma fasciculatum-Ceanothus greggii	4481			
					Adenostoma sparsifolium-Adenostoma fasciculatum-(*Ceanothus greggii-Quercus cornelius-mulleri-Cercocarpus betuloides*)	437	
	no	*Adenostoma sparsifolium-Cercocarpus betuloides*		4434			17
			Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos glauca	4478			
	yes	*Arctostaphylos glandulosa*		4305			10
			Arctostaphylos glandulosa	4804			
			Arctostaphylos glandulosa-Adenostoma fasciculatum	4454			
			Arctostaphylos glandulosa-Arctostaphylos pringlei	4456			
	yes				*Arctostaphylos glauca*	447	0
	yes	*Ceanothus crassifolius*		4310			38
			Ceanothus crassifolius-Adenostoma fasciculatum-Xylococcus bicolor	4463			
			Ceanothus crassifolius-Cercocarpus betuloides	4461			
			Ceanothus crassifolius-Malosma laurina	4462			
					Ceanothus crassifolius-Malosma laurina-(*Adenostoma fasciculatum-Salvia mellifera*)	444	
	yes	*Ceanothus cuneatus*		4496			3
	yes	*Ceanothus leucodermis*		4313			8
			Ceanothus leucodermis	4803			

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
	yes	*Ceanothus oliganthus*		4311			11
			Ceanothus oliganthus-Adenostoma fasciculatum	4459			
			Ceanothus oliganthus-Arctostaphylos glandulosa	4460			
			Ceanothus oliganthus-Eriodictyon crassifolium	4805			
					(*Chrysolepis sempervirens-Ceanothus cordulatus-Arctostaphylos patula*)	446	
	no	*Eriodictyon crassifolium*		4308			4
	no	*Heteromeles arbutifolia*		4445			15
			Heteromeles arbutifolia-Artemisia californica	4493			
			Heteromeles arbutifolia-Quercus berberidifolia-Cercocarpus betuloides-Fraxinus dipetala	4494			
	yes	*Malosma laurina*		4317			13
			Malosma laurina-Eriogonum fasciculatum	4384			
			Malosma laurina-Eriogonum fasciculatum-Salvia apiana	4472			
			Malosma laurina-Eriogonum fasciculatum-Salvia mellifera	4351			
					Malosma laurina-(*Eriogonum fasciculatum-Salvia mellifera-Salvia apiana-Artemisia californica*)	445	
			Malosma laurina-Tetracoccus dioicus	4473			
	yes	*Prunus ilicifolia*		4316			2
			Prunus ilicifolia-Heteromeles arbutifolia	4465			
	yes	*Quercus berberidifolia*		4321			33
			Quercus berberidifolia	4491			
					Quercus berberidifolia Pure	448	
			Quercus berberidifolia-Fraxinus dipetala-Heteromeles arbutifolia	4369			

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
			Quercus berberidifolia-Southern Mixed Chaparral	4490			
	yes	*Quercus berberidifolia-Adenostoma fasciculatum*		4322			22
			Quercus berberidifolia-Adenostoma fasciculatum	4366			
			Quercus berberidifolia-Adenostoma fasciculatum-Ceanothus crassifolius	4487			
	yes	*Quercus berberidifolia-Cercocarpus betuloides*		4364			17
			Quercus berberidifolia-Cercocarpus betuloides-Arctostaphylos glauca	4486			
			Quercus berberidifolia-Cercocarpus betuloides	4807			
			Quercus berberidifolia-Cercocarpus betuloides-Ceanothus crassifolius	4497			
					Quercus berberidifolia-(*Cercocarpus betuloides-Fraxinus dipetala-Heteromeles arbutifolia*)	441	
					Quercus berberidifolia-(*Cercocarpus betuloides-Quercus wislizeni-Fraxinus dipetala-Heteromeles arbutifolia*)	442	
	yes	*Quercus cornelius-mulleri*		4404			23
			Quercus cornelius-mulleri-Adenostoma sparsifolium-Ceanothus greggii	4475			
			Quercus cornelius-mulleri-Adenostoma sparsifolium-Cercocarpus betuloides	4474			
			Quercus cornelius-mulleri-Cercocarpus betuloides	4346			
	no	*Quercus palmeri*		4405			8
			Quercus palmeri-Eriogonum fasciculatum	4476			

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
			Quercus palmeri-Eriogonum wrightii	4477			
	yes	*Quercus wislizeni*		4324			15
			Quercus wislizeni-Adenostoma sparsifolium-Cercocarpus betuloides	4469			
			Quercus wislizeni-Cercocarpus betuloides	4466			
	no	*Quercus wislizeni-Ceanothus leucodermis*		4467			8
			Quercus wislizeni-Ceanothus leucodermis	4810			
			Quercus wislizeni-Ceanothus leucodermis/*Pinus coulteri*	4468			
	no	*Quercus wislizeni-Quercus berberidifolia*		1235		449	14
			Quercus wislizeni-Quercus berberidifolia	4811			
			Quercus wislizeni-Quercus berberidifolia-Fraxinus dipetala	4806			
	no	*Quercus wislizeni-Quercus chrysolepis*		1203			15
			Quercus wislizeni-Quercus chrysolepis	1280			
			Quercus wislizeni-Quercus chrysolepis/*Pinus coulteri*	1245			
	no				*Quercus* spp.	4323	0
	no	*Rhamnus tomentella* subsp. *tomentella*		4325			1
	no	*Rhus ovata*		4320			8
			Rhus ovata-Ziziphus parryi	4808			
					Mixed chaparral/(*Pinus coulteri*)	440	
III.A.4.N.a. Lowland microphyllous evergreen shrubland (and Lowland drought-deciduous shrubland – formation needs redefining)							
	yes	*Artemisia californica*		5401			22
			Artemisia californica/*Amsinckia menziesii*	5458			
			Artemisia californica-Malosma laurina	5456			

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
	yes	*Artemisia californica-Eriogonum fasciculatum*		5402			38
			Artemisia californica-Eriogonum fasciculatum	5457			
			Artemisia californica-Eriogonum fasciculatum-Malosma laurina	5454			
			Artemisia californica-Eriogonum fasciculatum-Salvia apiana	5455			
					Artemisia californica-Eriogonum fasciculatum- (*Salvia mellifera-Keckiella antirrhinoides*)	541	
					Artemisia californica- (*Eriogonum fasciculatum*)-Annual Grass-Herb	540	
	no	*Artemisia californica-Salvia apiana*		5432			13
			Artemisia californica-Salvia apiana	5469			
	yes	*Artemisia californica-Salvia mellifera*		5403			7
			Artemisia californica-Salvia mellifera	5442			
	yes	*Artemisia tridentata*		4510			23
			Artemisia tridentata	4533			
			Artemisia tridentata-Eriogonum fasciculatum	4531			
			Artemisia tridentata-Eriogonum wrightii	4532			
	yes	*Encelia californica*		5406			4
			Encelia californica-Artemisia californica	5438			
					Disturbed Shrub and Herb Coastal Sage Scrub	546	
	no	*Keckiella antirrhinoides*		5430			35
			Keckiella antirrhinoides	5465			
			Keckiella antirrhinoides Mixed Chaparral	5464			

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
			Keckiella antirrhinoides-Artemisia californica	5431			
			Keckiella antirrhinoides-Eriogonum fasciculatum	5461			
	no	*Lotus scoparius*		5416			3
	no	*Malacothamnus fasciculatus*		5413			2
	yes	*Salvia apiana*		5408			4
			Salvia apiana-Encelia farinosa	5460			
	yes	*Salvia mellifera*		5409			19
			Salvia mellifera	5441			
			Salvia mellifera-Lotus scoparius	5444			
			Salvia mellifera-Rhus ovata	5443			
III.B.1.N.a. Intermittently flooded microphyllous shrubland							
	yes	*Lepidospartum squamatum*		5508			14
			Lepidospartum squamatum/Amsinckia menziesii	5538			
			Lepidospartum squamatum-Atriplex canescens	5540			
			Lepidospartum squamatum-Baccharis salicifolia	5539			
			Lepidospartum squamatum-Eriogonum fasciculatum	5537			
					Lepidospartum squamatum-(*Eriogonum fasciculatum-Sambucus mexicana-Baccharis salicifolia*)	550	
III.A.4.N.c. Temporarily flooded microphyllous shrubland							
	yes	*Tamarix* sp.		4930			2
III.A.5.N.a. Broad-leaved and microphyllous evergreen extremely xeromorphic subdesert shrubland							
	yes	*Cercocarpus betuloides-Eriogonum fasciculatum*		4327			13
			Cercocarpus betuloides-Eriogonum fasciculatum – Eriogonum wrightii	4365			
			Cercocarpus betuloides-Eriogonum fasciculatum	4809			

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
					Cercocarpus betuloides-Eriogonum fasciculatum-(*Quercus cornelius-mulleri-Prunus ilicifolia*)	443	
	yes	*Simmondsia chinensis*		4603			8
			Simmondsia chinensis-Eriogonum fasciculatum-Opuntia parryi	4630		460	
III.A.5.N.b. Facultatively deciduous extremely xeromorphic subdesert shrubland							
					Atriplex spp.	5505	0
	yes	*Encelia farinosa*		5410			27
			Encelia farinosa	5439			
			Encelia farinosa-Artemisia californica	5437			
					Encelia farinosa-Eriogonum fasciculatum	542	
	no	*Ericameria palmeri*		5705			2
	yes	*Eriogonum fasciculatum*		5404			70
			Eriogonum fasciculatum	5451			
			Eriogonum fasciculatum-Bebbia juncea	5445			
			Eriogonum fasciculatum-Gutierrezia sarothrae	5466			
			Eriogonum fasciculatum-Opuntia parryi	5434			
			Eriogonum fasciculatum-Rhus ovata	5450	*Rhus ovata-Eriogonum fasciculatum*	451	
			Eriogonum fasciculatum-Simmondsia chinensis-Opuntia parryi	5449			
					Eriogonum fasciculatum-(*Encelia farinosa-Opuntia parryi-Bebbia juncea-Gutierrezia sarothrae-Yucca schidigera*)	543	
	no	*Eriogonum fasciculatum-Encelia farinosa*		5448			17
			Eriogonum fasciculatum-Encelia farinosa	5447			

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
	yes	*Eriogonum fasciculatum-Salvia apiana*		5407			13
			Eriogonum fasciculatum-Salvia apiana	5468			
					Eriogonum fasciculatum-Salvia apiana-(*Artemisia californica*)	544	
	no	*Lycium andersonii*		5203			3
III.A.5.N.c. Succulent extremely xeromorphic evergreen shrubland							
	yes	*Opuntia littoralis*		4702			1
III.A.5.N.e. Extremely xeromorphic evergreen shrubland with a sparse tree layer							
	yes	*Juniperus californica*		2106			18
			Juniperus californica/Annual Grass-Herb	2137			
			Juniperus californica-Eriogonum fasciculatum-Artemisia californica	2138			
			Juniperus californicus-Adenostoma fasciculatum-Eriogonum fasciculatum	2135			
					Juniperus californica Savannah	201	
					Juniperus californica Riparian	200	
					Juniperus californica-Coastal Sage Scrub	203	
					Juniperus californica-Chaparral	202	
					Juniperus californica Desert Transition	204	
					Juniperus californica-Sambucus mexicana	219	
III.B.2.N.a. Temperate cold-deciduous shrubland							
	yes	*Cercocarpus betuloides*		4315			12
			Cercocarpus betuloides	4498			
			Cercocarpus betuloides-Prunus ilicifolia-Adenostoma sparsifolium	4348			
	yes	*Ceanothus integerrimus*		5101			3
	no	*Rhus trilobata*		5103			1

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
	no	*Ribes quercetorum* Unique Stands		5104			1
III.B.2.N.c. Intermittently flooded cold-deciduous shrubland							
	yes	*Baccharis salicifolia*		4901			3
			Baccharis salicifolia-Sambucus mexicana	4931			
					Sambucus mexicana-(*Baccharis salicifolia*)	512	
	yes	*Suaeda moquinii*		5204			2
III.B.2.N.d. Temporarily flooded cold-deciduous shrubland							
	yes	*Forestiera pubescens*		5230			4
			Forestiera pubescens-Salix spp.	5231			
	yes	*Salix lasiolepis*		3204			3
III.B.2.N.e. Seasonally flooded cold-deciduous shrubland							
					Baccharis emoryi	492	
III.B.3.N.a. Extremely xeromorphic deciduous subdesert shrubland without succulents							
					Acacia greggii	513	
	yes	*Prosopis glandulosa*		5603			3
			Prosopis glandulosa-Sambucus mexicana	5630			
III.B.3.N.b. Intermittently flooded extremely xeromorphic deciduous subdesert shrubland							
					Chilopsis linearis	551	
III.C.2.N.a. Mixed evergreen - cold-deciduous shrubland							
					Toxicodendron diversilobum	511	
IV. Dwarf Shrubland							
IV.A.2.N.a. Extremely xeromorphic evergreen subdesert dwarf-shrubland							
	no	*Eriogonum wrightii*		5701			3
V. Herbaceous							
V.A.5.N.d. Medium-tall bunch temperate or subpolar grassland							
	Yes	*Sporobolus airoides*					
V.A.5.N.f. Short bunch temperate or subpolar grassland							
	yes	*Nassella pulchra*		6104			5
			Nassella pulchra-Erodium spp.*-Avena barbata*	6130			
V.A.5.N.j. Temporarily flooded temperate or subpolar grassland							
	yes	*Arundo donax*		6301			2

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
V.A.5.N.k. Seasonally flooded temperate or subpolar grassland							
	Yes	*Eleocharis macrostachya*					
			Eleocharis macrostachya-Eryngium aristulatum subsp. *parishii*	6245			
					Juncus spp.	6202	0
	no	*Muhlenbergia rigens*		6108			2
	no				Mountain meadows	623	
V.A.5.N.l. Semipermanently flooded temperate or subpolar grassland							
	yes	*Scirpus* spp.-*Typha* spp.		6402		622	4
V.B.2.N.h. Seasonally flooded perennial herbaceous vegetation							
	no	*Anemopsis californica*		6230			
	no	*Lepidium latifolium*		6303			1
V.D.2.N.d. Short temperate annual grassland							
	no	California Annual Grassland					8
			Bromus diandrus-Mixed Herb	7100			
			Bromus madritensis-Mixed Herb	7132			
			Hemizonia fasciculata-Annual Grass-Herb	7130			
				7134	*Avena* spp.-*Erodium* spp.	713	
				6215	Annual Grassland with Native Perennials	801	
					Non-native Annual Grasses with Forbs - (Native Perennial Grasses)	710	
					Weedy/Disturbance	710	
					Xeric Annual / Perennial Grassland Mapping (e.g. Bromus, Avena, Nassella, Aristida, Erodium spp.)	800	
V.D.2.N.b. Tall temperate or subpolar annual forb vegetation							
	no	*Amsinckia menziesii*		7109			6
			Amsinckia menziesii-Erodium spp.	7131			
					Brassica spp., *Hirschfeldia incana*	7107	0
					Hirschfeldia incana	712	
					Erodium spp.	711	
	no	*Salsola tragus*		6213			1

Formation Code and Name	In NVCS 2005	Alliance	Association	Map Code	Mapping Unit	Map Unit Code	n field samples
V.D.2.N.g. Seasonally flooded temperate annual grassland							
	no	*Hordeum depressum*					2
			Hordeum depressum-Hemizonia fasciculata-Atriplex coronata var. *notatior*	6236			
V.D.2.N.h. Seasonally flooded temperate annual forb vegetation							
		Hemizonia pungens subsp. *laevis* Unique Stands		6238			2
	no	*Lasthenia californica*		6208			4
			Lasthenia californica-Atriplex coronata var. *notatior*	6232			
	no	*Plagiobothrys leptocladus* Unique Stands		6215	See *Hordeum depressum*		1
	no	*Kochia scoparia*		6212			2
			Kochia scoparia - Bassia hyssopifolia	6235			
	no	Vernal Alkali Plain			Alkaline Ephemeral Wetland	621	0
	no	Vernal Pool			Santa Rosa Plateau Vernal Pool	620	0

Table 2. Proposed additional plant communities that have been personally observed or included in other reports (Bramlet, personal communications; Klein and Larsen, reconnaissance; Bramlet 1994a, 1994b; Minnich 1976). These types are not described further in this report and require additional inventory.

Tree-Overstory Vegetation
Abies concolor (White Fir)
Fraxinus uhdei (Ash)
Fraxinus velutina (Velvet Ash)
Pinus ponderosa (Ponderosa Pine)
Umbellularia californica (California Laurel)
Shrub-Overstory Vegetation
Arctostaphylos patula (Greenleaf Manzanita)
Bebbia juncea (Sweetbush)
Brickellia californica (California Brickellbush)
Ceanothus cordulatus (Whitethorn Ceanothus)
Chrysolepis sempervirens (Bush Chinquapin)
Isocoma menziesii (Coast Goldenbush)
Sambucus mexicana (Mexican Elderberry)
Schinus molle (Peruvian Pepper Tree)
Toxicodendron diversilobum (Poison Oak)
Yucca whipplei (Chaparral Yucca)
Herbaceous Vegetation
Achnatherum spp. (Needlegrass)
Aristida spp. (Three-Awn)
Avena spp. (Oats)
Bromus diandrus (Ripgut Grass)
Bromus madritensis subsp. *rubens* (Foxtail Chess)
Cyperus (Nutsedge)
Deschampsia danthonioides- Phalaris lemmonii (Annual Hairgrass-Lemmon's Canary Grass)
Distichlis spicata (Saltgrass)
Dudleya spp. (Dudleya)
Erodium spp. (Stork's Bill)
Frankenia salina (Alkali Heath)
Hirschfeldia incana (Shortpod Mustard)
Juncus bufonius (Common Toad Rush)
Juncus mexicanus (Mexican Rush)
Juncus xiphioides (Iris-leaved Rush)
Koeleria macrantha (Junegrass)
Leymus condensatus (Giant Wildrye)
Leymus triticoides (Creeping Ryegrass)
Lolium multiflorum (Italian Ryegrass)
Melica imperfecta (Small-flowered Melic Grass)
Melilotus indicus (Sourclover)
Mirabilis californica (Wishbone Bush)
Nassella cernua (Nodding Needlegrass)
Pellaea andromedifolia (Coffee Fern)
Phacelia ramosissima (Branching Phacelia)
Phalaris spp. (Canary Grass)
Plagiobothrys leptocladus (Alkali Plagiobothrys)
Pluchea odorata (Salt Marsh Fleabane)
Pluchea sericea (Arrow Weed)
Poa secunda (Perennial Bluegrass)
Polypogon monspeliensis (Annual Beard Grass)
Psilocarphus brevissimus var. *brevissimus* (Woolly Marbles)
Salicornia subterminalis (Parish's glasswort)
Scirpus spp. (Bulrush)
Scirpus maritimus (Alkali Bulrush)
Typha domingensis (Typha domingensis)

Herbaceous Vegetation
Typha latifolia (Broad-leaved Cattail) *Vulpia* spp. (Fescue)
Cryptogam Vegetation
Selaginella bigelovii (Bushy Spikemoss)

KEY

The key for distinguishing vegetation types (Table 3) is not strictly dichotomous. Due to the diversity of vegetation in the mapping area, and to avoid an excessively long document, a series of paired statements (or couplets) was not developed for each option. Instead, sets of characteristics with choices beneath them are provided. The key will first lead the user to the general options, and the individual selections for the vegetation associations will be listed beneath these options. Simply work through the numbered list of types from the more general to the most specific options until the best fit is reached. The choices are identified by a combination of alphanumeric codes, using capital letters, numerals, upper- and lowercase letters, and decimal points to distinguish the different key levels. The most basic, general levels in the key are on the left side of the alphanumeric code, and the most specific are on the right side. This coding system in the key relates to a series of left indentations.

Thus, down the left-hand side of the pages are the major groupings; nested within them are the sub-groupings. The preliminary key will direct you to the major groups, such as forest/woodland, shrubland, and herbaceous, with the more specific choices beneath them. The more specific lists within these are generally based on presence/absence or dominance/sub-ordinance of species until arriving at the optimum choice. Please note: SINCE THERE MAY BE MORE THAN TWO ALTERNATIVES IN A GROUP, BE SURE TO WORK THROUGH ALL OF THE OPTIONS IN A LIST BEFORE YOU DECIDE WHAT IS THE BEST CHOICE.

Table 3. Field key to the defined vegetation associations of Western Riverside County, California.

Class A. Vegetation with an overstory of trees (at least 5 m tall). Tree canopy is generally greater than 10%, but occasionally may be less than 10% over a denser understory of shrub and/or herbaceous species = **Tree-Overstory Vegetation** (Page 39)

Class B. Vegetation characterized by woody shrubs in the canopy. Tree species, if present, generally total less than 10% absolute cover. Herbaceous species may total higher cover than shrubs. Shrubs are usually at least 10% cover = **Shrub-Overstory Vegetation** (Page 46)

Class C. Vegetation characterized by non-woody, herbaceous species in the canopy including grass, graminoid, and broad-leaved herbaceous species. Shrubs, if present, usually comprise <10% of the vegetation. Trees, if present, generally compose <5% cover: **= Herbaceous Vegetation** (Page 60)

Class A. Tree-Overstory Vegetation

Group I: Woodlands and forests characterized by needle or scale-leaved conifer trees, including pine (*Pinus*), fir (*Abies*), incense cedar (*Calocedrus*), etc. The conifers may only occur intermittently in the overstory and may be associated with tree oaks or shrubs.

I.A. The overstory is dominated by pine (*Pinus*) trees alone or in shared dominance with broadleaf evergreen trees or shrubs.

IA.1. Lodgepole pine (*Pinus contorta*) occurs as the dominant conifer or co-occurs with other conifers in an open overstory…

***Pinus contorta* Alliance**

IA.2. Limber pine (*Pinus flexilis*) occurs as the dominant conifer or co-occurs with other conifers in an open overstory…

***Pinus flexilis* Alliance**

IA.2.a. Lodgepole pine (*Pinus contorta*) occurs with limber pine and other conifers in the overstory, and bush chinquapin (*Chrysolepis sempervirens*) and other species are present in the understory…

***Pinus flexilis-Pinus contorta*/*Chrysolepis sempervirens* Association**

IA3. Knobcone pine (*Pinus attenuata*) occurs as the dominant conifer or co-occurs with other conifers in an open to intermittent overstory…

***Pinus attenuata* Alliance**

IA3.a. Coulter pine may occur in the overstory with knobcone pine, and Eastwood manzanita (*Arctostaphylos glandulosa*) occurs in the understory…

***Pinus attenuata*/*Arctostaphylos glandulosa* Association**

IA.4. Coulter pine (*Pinus coulteri*) occurs as a dominant or co-dominant conifer tree in an open to intermittent tree canopy, and there may be an abundant sub-canopy of oaks (*Quercus*) or an abundant understory of shrubs such as oaks and manzanita (*Arctostaphylos*)…

IA4.a. Canyon live oak (*Quercus chrysolepis*) occurs in the overstory, and Coulter pine is usually co-dominant or sub-dominant…

***Pinus coulteri-Quercus chrysolepis* Alliance**

IA4a.i. Pink-bracted manzanita (*Arctostaphylos pringlei*) characteristically occurs in the open to intermittent understory with other shrubs and herbs…

***Pinus coulteri-Quercus chrysolepis*/*Arctostaphylos pringlei* Association**

IA4.b. Black oak occurs with Coulter pine, where black oak is dominant or both species are co-dominant…

***Quercus kelloggii* Alliance**

IA4b.i Coulter pine is sub-dominant to co-dominant with black oak in the overstory, while Eastwood manzanita is characteristically present in the understory…

***Quercus kelloggii-Pinus coulteri*/*Arctostaphylos glandulosa* Association**

IA4b.ii. Coulter pine is sub-dominant to co-dominant with black oak in the overstory, while pink-bracted manzanita is characteristically present in the understory…

***Quercus kelloggii-Pinus coulteri*/*Arctostaphylos pringlei* Association**

IA4.c. Other oak species occurs as understory shrubs or sub-canopy trees with Coulter pine in the overstory…

***Pinus coulteri* Alliance**

IA4c.i. Interior live oak (*Quercus wislizeni*) and Eastwood manzanita (*Arctostaphylos glandulosa*) characteristically occur together in a mixed understory, usually with other shrubs…

***Pinus coulteri*/*Arctostaphylos glandulosa-Quercus wislizeni* Association**

IA4c.ii. Interior live oak occurs as a main understory shrub or sub-canopy tree, and other shrubs and trees may be present at low cover…

***Pinus coulteri*/*Quercus wislizeni* Association**

IA.5. Jeffrey pine (*Pinus jeffreyi*) occurs as a dominant or co-dominant conifer tree in an open to intermittent overstory as a canopy tree, and there may be an abundant sub-canopy of oaks (*Quercus*) or an understory of shrubs and herbs…

IA5.a. Jeffrey pine occurs as the main conifer species in the overstory…

***Pinus jeffreyi* Alliance**

IA5a.i. Great Basin sagebrush (*Artemisia tridentata*) and other shrubs and herbs occur in the understory…

***Pinus jeffreyi*/*Artemisia tridentata*/*Penstemon centranthifolius* Association**

IA5a.ii. Palmer's oak (*Quercus palmeri*) occurs in a lower canopy…

***Pinus jeffreyi*/*Quercus palmeri* Association**

IA5a.iii. Interior live oak and sometimes canyon live oak occur in a lower canopy…

***Pinus jeffreyi*/*Quercus wislizeni* Association**

IA5a.iv. Black oak (*Quercus kelloggii*) occurs as a canopy or sub-canopy tree with Jeffrey pine…

***Pinus jeffreyi-Quercus kelloggii* Association**

IA5a.v. White fir (*Abies concolor*) occurs as co-dominant with Jeffrey Pine and bush chinquapin and other shrubs occur in the understory…

***Pinus jeffreyi-Abies concolor*/*Chrysolepis sempervirens* Association**

IA.6. Jeffrey pine occurs as a sub-dominant conifer tree with sugar pine (*Pinus lambertiana*) and white fir in the overstory...

***Abies concolor-Pinus lambertiana-Pinus jeffreyi* Association**

IA.7. Parry pinyon occurs as the sole dominant conifer in an open overstory…
***Pinus quadrifolia* Alliance**

IA7.a. Muller oak occurs in the understory with a mixture of other shrub species…
***Pinus quadrifolia*/*Quercus cornelius-mulleri* Association**

I.B. The overstory is dominated by one or more conifer species of fir (*Abies*), incense cedar (*Calocedrus*), Douglas-fir (*Pseudotsuga*), etc, and the conifers may have shared dominance with broadleaf evergreen trees or shrubs.

IB.1. Bigcone Douglas-fir occurs as the primary dominant conifer in the overstory as a canopy tree, and there may be an abundant sub-canopy of oaks (*Quercus*)…
***Pseudotsuga macrocarpa* Alliance**

IB1.a. Canyon live oak occurs as a dominant sub-canopy tree and sometimes as an understory shrub and is co-dominant or sub-dominant to bigcone Douglas-fir…
***Pseudotsuga macrocarpa-Quercus chrysolepis* Association**

IB.2. Incense cedar (*Calocedrus decurrens*) occurs as the primary dominant conifer in the overstory as a canopy tree, and there may be an abundant sub-canopy of oaks (*Quercus*)…
***Calocedrus decurrens* Alliance**

IB2.a. Black oak occurs as a dominant sub-canopy tree and may co-dominate with canyon live oak or black oak…
***Calocedrus decurrens-Quercus chrysolepis-Quercus kelloggii* Association**

IB.3. White fir occurs as a dominant or co-dominant conifer in the overstory…

IB3.a. Incense cedar is sub-dominant to co-dominant with white fir, and sugar pine is not present in the overstory…
***Abies concolor-Calocedrus decurrens* Alliance**

IB3a.i. Jeffrey pine occurs as a sub-dominant conifer with white fir and incense cedar…
***Abies concolor-Calocedrus decurrens-Pinus jeffreyi* Association**

IB3.b. Sugar pine is sub-dominant to co-dominant (and at least 2% cover) with white fir, and other conifers may also occur…
***Abies concolor-Pinus lambertiana* Alliance**

IB3b.i. Incense cedar and canyon live oak occur in the canopy or sub-canopy with white fir and sugar pine…
***Abies concolor-Pinus lambertiana-Calocedrus decurrens-Quercus chrysolepis* Association**

IB3b.ii. Jeffrey pine occurs as a sub-dominant conifer tree with sugar pine (*Pinus lambertiana*) and white fir in the overstory...
***Abies concolor-Pinus lambertiana-Pinus jeffreyi* Association**

IB3.c. Jeffrey pine occurs as a co-dominant conifer with white fir in the overstory…
***Pinus jeffreyi* Alliance**

IB3c.i. Bush chinquapin and other shrubs occur in the understory…
***Pinus jeffreyi-Abies concolor*/*Chrysolepis sempervirens* Association**

<u>Group II.</u> Woodlands and forests characterized mainly by broad-leaved evergreen and deciduous tree species such as oaks (*Quercus*), willows (*Salix*), etc.

II.A. California sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii*), willows (*Salix*), and other wetland trees usually dominate or co-dominate in the overstory in riparian habitats…

IIA.1. California sycamore provides an open to intermittent tree overstory. It may occur as the sole dominant tree in the overstory, or it may share dominance with Fremont Cottonwood (also as a canopy tree) and/or with willows (as sub-canopy trees), or it sometimes may have lower cover than cottonwood or willow species …

IIA1.a. California sycamore is the sole dominant tree in the canopy or shares dominance with willows, which may be in the canopy or sub-canopy…

***Platanus racemosa* Alliance**

IIA1a.i. California sycamore is the sole dominant in the overstory, while *Eucalyptus* or other invasive trees may be present. The understory has a mixture of grasses, herbs, and shrubs…

***Platanus racemosa*/Annual Grass-Herb Association**

IIA1a.ii. Red willow usually shares dominance with California sycamore in the overstory (they may be co-dominant or either may be dominant). In the understory, arroyo willow occurs with mulefat (*Baccharis salicifolia*) and other species…

***Platanus racemosa-Salix laevigata*/*Salix lasiolepis-Baccharis salicifolia* Association**

IIA1.b. California sycamore occurs with Fremont cottonwood in the overstory canopy (both at varying cover), and willows are often present in the sub-canopy…

***Platanus racemosa-Populus fremontii* Alliance**

IA1b.i. Arroyo willow and narrowleaf willow occur in the sub-canopy or shrub layer. American bulrush (*Scirpus americanus*) or other herbs occur in the understory…

***Platanus racemosa-Populus fremontii*/*Salix lasiolepis-Salix exigua*/*Scirpus americanus* Association**

IA1b.ii. Mainly arroyo willow occurs as the dominant in the sub-canopy or shrub layer while red willow may sometimes be present. A variety of shrubs and herbs may also be present…

***Platanus racemosa-Populus fremontii*/*Salix lasiolepis* Association**

IIA.2. Fremont cottonwood provides an open to intermittent tree overstory canopy. Willows may occur in the sub-canopy as co-dominants (though sometimes they are higher in cover), or Fremont cottonwood occurs as the sole dominant tree…

***Populus fremontii* Alliance**

IIA2.a. Fremont cottonwood is the sole dominant tree in the overstory. Mulefat is abundant in the understory, sometimes with *Tamarix*…

***Populus fremontii*/*Baccharis salicifolia* Association**

IIA2.b. Fremont cottonwood is dominant in the overstory as a canopy tree, or it shares dominance with willows, which are in the canopy or sub-canopy…

IIA2b.i. Black willow is present and sub-dominant or co-dominant with Fremont Cottonwood and shining willow (*Salix lucida*) is absent. Mulefat is present with other shrubs in the understory…

***Populus fremontii-Salix gooddingii*/*Baccharis salicifolia* Association**

IIA2b.ii. Red willow is present and co-dominant to dominant with Fremont cottonwood in the tree overstory. Shrubs are sparsely present, including common elderberry (*Sambucus mexicana*)…

***Populus fremontii-Salix laevigata* Association**

IIA2b.iii. Red willow is co-dominant to dominant with Fremont Cottonwood in the tree overstory. Arroyo willow and desert wild grape (*Vitis girdiana*) are co-dominant in the understory…

***Populus fremontii-Salix laevigata/Salix lasiolepis/Vitis girdiana* Association**

IIA2b.iv. Red willow is co-dominant to dominant in the tree overstory with Fremont Cottonwood. Arroyo willow and mulefat are usually co-dominant in the understory…

***Populus fremontii-Salix laevigata/Salix lasiolepis-Baccharis salicifolia* Association**

IIA.3. One or more willow species are the primary tree(s) in the overstory…

IIA3.a. Black willow (*Salix gooddingii*) is the dominant tree or co-dominant with other willows…

***Salix gooddingii* Alliance**

IIA3a.i. Black willow is the sole dominant in the tree canopy, and there is a minor presence of understory shrub species…

***Salix gooddingii* Association**

IIA3a.ii. Black willow is usually dominant in the canopy, and red willow is often present. Mulefat is characteristically present and usually dominant in the understory…

***Salix gooddingii/Baccharis salicifolia* Association**

IIA3a.iii. Black willow is the sole dominant in the canopy, and perennial pepperweed (*Lepidium latifolium*) is usually dominant in the understory…

***Salix gooddingii/Lepidium latifolium* Association**

IA3a.iv. Black willow has shared dominance in the canopy with shining willow and/or Fremont cottonwood (*Populus fremontii*)*…*

***Salix gooddingii-Salix lucida-Populus fremontii* Association**

IIA3.b. Red willow (*Salix laevigata*) is the dominant tree in the canopy or is co-dominant with arroyo willow (*S. lasiolepis*) in the sub-canopy…

***Salix laevigata* Alliance**

IIA3b.i. Red willow occurs with arroyo willow, and mugwort (*Artemisia douglasiana*) is usually present in the understory with a variety of other herbs and shrubs…

***Salix laevigata/Salix lasiolepis/Artemisia douglasiana* Association**

IIA3.c. Shrublands in which arroyo willow (*Salix lasiolepis*) is dominant. An emergent and sparse tree layer may also be present…

***Salix lasiolepis* Alliance**

IIA.4. White alder (*Alnus rhombifolia*) is the primary tree in the overstory, or it shares dominance with other trees…

***Alnus rhombifolia* Alliance**

IIA4.a. White alder is the sole dominant tree, though incense-cedar occasionally may be co-dominant…

***Alnus rhombifolia* Association**

IIA4.b. White alder is co-dominant with California sycamore…

***Alnus rhombifolia-Platanus racemosa* Association**

IIA.5. Coast live oak occurs as the dominant tree in the canopy, while California sycamore may be sub-dominant…

***Quercus agrifolia* Alliance**

IIA5.a. California sycamore is a sub-dominant tree with coast live oak. Poison oak is the dominant shrub in the understory, while a variety of other shrubs and herbs may occur…

***Quercus agrifolia-Platanus racemosa*/*Toxicodendron diversilobum* Association**

IIA5.b. California sycamore and red willow are sub-dominant trees with coast live oak. Arroyo willow and mulefat are most often present in the understory…

***Quercus agrifolia-Platanus racemosa-Salix laevigata* Association**

IIA5.c. Coast live oak is the sole dominant tree in the canopy, though willows, California sycamore, alders, or other riparian trees are present at trace cover. Poison oak (*Toxicodendron diversilobum*) or toyon (*Heteromeles arbutifolia*), and/or arroyo willow is/are often present in the understory…

***Quercus agrifolia*/*Toxicodendron diversilobum* Riparian Association**

IIA.6. A species of tamarisk (*Tamarix*) dominates in the tree/shrub canopy, though there may be a minor presence of native trees/shrubs…

***Tamarix* Alliance**

IIA.7. One or more eucalyptus *(Eucalyptus)* species dominates in the tree canopy, while there may be a minor presence of native trees or shrubs. The understory usually has a variety of herbaceous species at moderate to high cover, including native and non-native species…

***Eucalyptus* spp. Alliance**

IIB. Woodlands and forests in upland and mesic habitats where one or more oak (*Quercus*) species occur as dominant trees in the canopy…

IIB.1. Engelmann Oak (*Quercus engelmannii*) is the dominant species in the overstory, or it shares dominance with coast live oak…

***Quercus engelmannii* Alliance**

IIB1.a. Engelmann Oak is the sole dominant in the overstory. Poison oak is dominant at low cover in the shrub layer, and a variety of herbs occur at medium to high cover…

***Quercus engelmannii* /*Toxicodendron diversilobum*/Grass Association**

IIB1.b. Engelmann Oak is the sole dominant in the overstory. Scrub oak and chamise are co-dominant at moderate cover in the shrub layer, and herbs occur at low cover…

***Quercus engelmannii*/*Quercus berberidifolia* Association**

IIB1.c. Engelmann Oak is usually co-dominant with coast live oak. California sagebrush *Artemisia californica*) is usually dominant in the shrub layer, and herbs occur at low cover…

***Quercus engelmannii-Quercus agrifolia*/*Artemisia californica* Association**

IIB1.d. Engelmann Oak is usually co-dominant with coast live oak. Poison oak is dominant at low cover in the shrub layer, and herbs occur at medium to high cover…

***Quercus engelmannii-Quercus agrifolia*/*Toxicodendron diversilobum*/Annual Grass-Herb Association**

IIB.2. Coast live oak is the dominant species in the overstory…

***Quercus agrifolia* Alliance**

IIB2.a. While the overstory is dominated solely by coast live oak, the understory is primarily dominated by annual grasses and herbs…

***Quercus agrifolia*/Annual Grass-Herb Association**

IIB2.b. While the overstory is dominated solely by coast live oak, the understory is primarily dominated by Poison oak in one layer and annual grasses and herbs in another layer, both of which exhibit similar understory cover…

***Quercus agrifolia*/Toxicodendron diversilobum/Grass**

IIB2.c. While the overstory is dominated solely by coast live oak, the understory is primarily dominated by a mixture of chaparral shrubs, including scrub oak, toyon, chamise (*Adenostoma fasciculatum*), etc…

***Quercus agrifolia*/Chaparral Association**

IIB.3. Black oak is the dominant species in the overstory, while conifers (such as Coulter pine) may be emergent and sub-dominant or they may be co-dominant…

***Quercus kelloggii* Alliance**

IIB3.a. Coulter pine is sub-dominant to co-dominant with black oak in the overstory, while Eastwood manzanita is characteristically present in the understory…

***Quercus kelloggii-Pinus coulteri*/*Arctostaphylos glandulosa* Association**

IIB3.b. Coulter pine is sub-dominant to co-dominant with black oak in the overstory, while pink-bracted manzanita is characteristically present in the understory…

***Quercus kelloggii-Pinus coulteri*/*Arctostaphylos pringlei* Association**

IIB.4. Canyon live oak is the dominant species in the overstory. Conifers (such as Jeffrey pine or bigcone Douglas-fir) may be emergent and sub-dominant…

***Quercus chrysolepis* Alliance**

IIB4.a. Canyon live oak is the sole dominant species in the overstory as a tree or sometimes as a shrub. Conifers or other oak species may infrequently occur at low cover…

***Quercus chrysolepis* Association**

IIB4.b. Canyon live oak is the sole dominant species in the overstory as a tree, and Jeffrey pine and white fir are characteristically present at low cover…

***Quercus chrysolepis-Pinus jeffreyi* Association**

IIB4.c. Canyon live oak is the sole dominant species in the overstory as a tree, and bigcone Douglas-fir is characteristically present at low cover…

***Quercus chrysolepis-Pseudotsuga macrocarpa* Association**

IIB.5. Canyon live oak co-dominates with interior live oak (*Quercus wislizeni*). Additively, they may dominate in the same layer or in the shrub and tree layers, though canyon live oak usually occurs in the tree layer at greater than 10% cover.…

***Quercus wislizeni-Quercus chrysolepis* Alliance**

IIB5.a. Interior live oak and canyon live oak typically occur as co-dominants in relatively pure stands, and Coulter pine is absent or present at <1% cover…

***Quercus wislizeni-Quercus chrysolepis* Association**

IIB5.d. Interior live oak and canyon live oak typically occur as co-dominants and Coulter pine is present at >3% cover…

***Quercus wislizeni-Quercus chrysolepis*/*Pinus Coulteri* Association**

IIB.6. Interior live oak occurs as a dominant or co-dominant with other species in the tree/shrub overstory. Scrub oak (*Quercus berberidifolia*) is absent and, if present, canyon live oak occurs at trace cover…

***Quercus wislizeni* Alliance (See Class B, Group IB6. for key to associations)**

Class B. Shrub-Overstory Vegetation

Group I: Shrublands dominated by sclerophyllous temperate broad-leaved shrubs (with leaves hardened by a waxy cuticle). They are dominated by typical chaparral and evergreen montane chaparral shrub genera; including chamise (*Adenostoma fasciculatum*), manzanita (*Arctostaphylos*), *Ceanothus,* mountain mahogany (*Cercocarpus*), scrub oaks (*Quercus*), coffeeberry (*Rhamnus*), etc.

I.A. Desert transition shrubs of California juniper (*Juniperus californica*) or Jojoba (*Simmondsia chinensis*) occurring as co-dominants to dominants in a shrub overstory…

IA.1. California juniper occurs as a co-dominant to dominant in an open to intermittent shrub overstory. Shrubs such as chamise (*Adenostoma fasciculatum*) and California buckwheat (*Eriogonum fasciculatum*) may occur in a sub-canopy of the shrub layer…

***Juniperus californica* Alliance**

IA1.a. Various mixtures of annual grasses and forbs occur at low to dense cover in the understory of California juniper, while a variety of other shrub species may occur at sparse cover…

***Juniperus californical*Annual Grass-Herb Association**

IA1.b. Chamise and California buckwheat occur as sub-dominant to co-dominants in a sub-canopy of the shrub layer…

***Juniperus californica-Adenostoma fasciculatum-Eriogonum fasciculatum* Association**

IA1.c. California buckwheat and California sagebrush (*Artemisia californica*) characteristically occur as sub-dominants in a sub-canopy of the shrub layer…

***Juniperus californica -Eriogonum fasciculatum-Artemisia californica* Association**

IA.2. Jojoba occurs as a co-dominant to dominant with other shrubs in an open to intermittent shrub overstory…

***Simmondsia chinensis* Alliance**

IA2.a. California buckwheat and cane cholla (*Opuntia parryi*) occur as sub-dominant to co-dominant shrubs in the overstory…

***Simmondsia chinensis-Eriogonum fasciculatum-Opuntia parryi* Association**

I.B. The overstory is dominated primarily by one species of shrub oak (*Quercus*) or has shared dominance with other chaparral shrub species such as…

IB.1. Scrub oak (*Quercus berberidifolia*) usually occurs as a dominant or, if it co-dominates, it is not co-dominant with chamise nor birchleaf mountain-mahogany…

***Quercus berberidifolia* Alliance**

IB1.a. Scrub oak occurs as the sole dominant in the shrub layer. Other shrubs may occur as sub-dominants and, additively, cover less than 15% of the stand...

***Quercus berberidifolia* Association**

IB1.b. California ash and toyon characteristically occur as sub-dominants or co-dominants, and bigberry manzanita (*Arctostaphylos glauca*) is typically absent. Shrubs other than scrub oak additively cover greater than 15% of stand …

***Quercus berberidifolia-Fraxinus dipetala-Heteromeles arbutifolia* Association**

IB1.c. Scrub oak usually occurs as a co-dominant with *Ceanothus tomentosus* (woolyleaf ceanothus), hairyleaf ceanothus, silk tassle bush (*Garrya flavescens*), or Eastwood manzanita. If present, bigberry manzanita and/or California ash occur at extremely trace cover. Shrubs other than scrub oak additively cover greater than 30% of stand…

***Quercus berberidifolia* Southern Mixed Chaparral Association**

IB.2. Scrub oak usually co-dominates with chamise …

***Quercus berberidifolia-Adenostoma fasciculatum* Alliance**

IB2.a. Other chaparral shrubs additively cover less than 15% of stand, and hoaryleaf Ceanothus is not usually present…

***Quercus berberidifolia-Adenostoma fasciculatum* Association**

IB2.b. Hoaryleaf ceanothus is characteristically present as a sub-dominant to co-dominant…

***Quercus berberidifolia-Adenostoma fasciculatum-Ceanothus crassifolius* Association**

IB.3. Scrub oak usually occurs as a co-dominant or sub-dominant with birchleaf mountain-mahogany…

***Quercus berberidifolia-Cercocarpus betuloides* Alliance**

IB3.a. Birchleaf mountain-mahogany is typically greater than 10% cover, sometimes greater in cover than scrub oak, and bigberry manzanita is not present…

***Quercus berberidifolia-Cercocarpus betuloides* Association**

IB3.b. Birchleaf mountain-mahogany and bigberry manzanita are consistently present and additively have greater or equal cover to scrub oak…

***Quercus berberidifolia-Cercocarpus betuloides-Arctostaphylos glauca* Association**

IB3.c. Birchleaf mountain-mahogany and hoaryleaf Ceanothus consistently occur with scrub oak and all three species are nearly equal in cover. California ash is not present…

***Quercus berberidifolia-Cercocarpus betuloides-Ceanothus crassifolius* Association**

IB.4. Muller oak occurs at low to moderate cover as a sub-dominant to dominant in the shrub overstory…

***Quercus cornelius-mulleri* Alliance**

IB4.a. Birchleaf mountain mahogany occurs as a co-dominant or dominant. If present, redshank occurs at less than 1% cover…

***Quercus cornelius-mulleri-Cercocarpus betuloides* Association**

IB4.b. Redshank characteristically occurs as a sub-dominant to dominant (with at least 1% cover or more)…

IB4b.i. Birchleaf mountain mahogany occurs as a sub-dominant or co-dominant. If cupleaf ceanothus is present, it is lower in cover than Birchleaf mountain mahogany…

***Quercus cornelius-mulleri-Adenostoma sparsifolium-Cercocarpus betuloides* Association**

IB4b.ii. Cupleaf ceanothus occurs as a sub-dominant or co-dominant. If Birchleaf mountain mahogany is present, it is lower in cover than Cupleaf ceanothus…

***Quercus cornelius-mulleri-Adenostoma sparsifolium-Ceanothus greggii* Association**

IB.5. Palmer's oak (*Quercus palmeri*) usually occurs as a dominant or co-dominant in the shrub overstory…

***Quercus palmeri* Alliance**

IB5.a. California buckwheat occurs as a sub-dominant or co-dominant in the shrub sub-canopy…
***Quercus palmeri-Eriogonum fasciculatum* Association**

IB5.b. Wright's buckwheat (*Eriogonum wrightii*) occurs as a sub-dominant in the shrub sub-canopy…
***Quercus palmeri-Eriogonum wrightii* Association**

IB.6. The overstory is usually dominated by interior live oak alone or in shared dominance with other species (i.e., redshank, birchleaf mountain-mahogany, chaparral whitethorn, scrub oak, canyon live oak) in the shrub and/or tree layers…

IB6.a. Interior live oak occurs as a dominant or co-dominant in the shrub and/or tree layer(s) with shrubs such as birchleaf mountain mahogany and/or redshank. Scrub oak (*Quercus berberidifolia*) is absent and, if present, canyon live oak occurs at trace cover…
***Quercus wislizeni* Alliance**

IB6a.i. Redshank and birchleaf mountain-mahogany consistently occur at low to moderate cover…
***Quercus wislizeni-Adenostoma sparsifolium-Cercocarpus betuloides* Association**

IB6a.ii. Birchleaf mountain-mahogany occurs as a co-dominant or sub-dominant and redshank is not present…
***Quercus wislizeni-Cercocarpus betuloides* Association**

IB6.b. Chaparral whitethorn usually occurs as a co-dominant and redshank is not present…
***Quercus wislizeni-Ceanothus leucodermis* Alliance**

IB6b.i. Chaparral whitethorn occurs as a co-dominant and Coulter pine (*Pinus Coulteri*) is absent…
***Quercus wislizeni-Ceanothus leucodermis* Association**

IB6b.ii. Coulter pine occurs characteristically at less than 10% cover…
***Quercus wislizeni-Ceanothus leucodermis\|Pinus coulteri* Association**

IB6.c. Scrub oak occurs as a dominant or co-dominant…
***Quercus wislizeni-Quercus berberidifolia* Alliance**

IB6c.i. Various shrubs intermix as sub-dominants and California ash is absent…
***Quercus wislizeni-Quercus berberidifolia* Association**

IB6c.ii. California ash characteristically occurs and intermixes with other shrubs…
***Quercus wislizeni-Quercus berberidifolia-Fraxinus dipetala* Association**

IB6.d. Canyon live oak occurs in the shrub/tree layer(s) at greater than 10% cover. Additively, interior live oak and canyon live oak dominate stands and may occur in the same layer or in the shrub and tree layers…
***Quercus wislizeni-Quercus chrysolepis* Alliance**

IB6d.i Interior live oak and canyon live oak typically occur as co-dominants and Coulter pine is absent or present at less than 1% cover…
***Quercus wislizeni-Quercus chrysolepis* Association**

IB6d.ii. Interior live oak and canyon live oak typically occur as co-dominants and Coulter pine is present at greater than 3% cover…

***Quercus wislizeni-Quercus chrysolepis*/*Pinus Coulteri* Association**

I.C. The overstory is dominated by species of yerba santa (*Eriodictyon crassifolium*), hollyleaf cherry (*Prunus ilicifolia*), coffeeberry (*Rhamnus tomentella*), oak gooseberry (*Ribes quercetorum*), sugarbush (*Rhus ovata*), or toyon (*Heteromeles arbutifolia*) and the shrubs may have shared dominance with other evergreen, coastal scrub or succulent shrubs…

IC.1. Yerba santa occurs as the dominant shrub in an open to intermittent overstory while other shrubs may be present at low cover …

***Eriodictyon crassifolium* Alliance**

IC.2. Hollyleaf cherry occurs as a dominant or co-dominant shrub with other shrubs in an open to intermittent overstory…

***Prunus ilicifolia* Alliance**

IC2.a. Toyon occurs as a sub-dominant to co-dominant shrub in the overstory…

***Prunus ilicifolia-Heteromeles arbutifolia* Association**

IC2.b. Hollyleaf cherry occurs as a sub-dominant to co-dominant with mountain mahogany (*Cercocarpus betuloides*), and redshank (*Adenostoma sparsifolium*) is often sub-dominant in the shrub overstory…

***Cercocarpus betuloides-Prunus ilicifolia-Adenostoma sparsifolium* Association**

IC.3. Chaparral coffeeberry occurs as the dominant shrub in the overstory…

***Rhamnus tomentella* Alliance**

IC.4. Oak gooseberry occurs as the dominant shrub in the overstory…

***Ribes quercetorum* Unique Stands**

IC.5. Toyon occurs as a co-dominant to dominant shrub in an open to continuous shrub overstory…

***Heteromeles arbutifolia* Alliance**

IC5.a. California sagebrush occurs as a co-dominant with Toyon in the overstory…

***Heteromeles arbutifolia-Artemisia californica* Association**

IC5.b. Scrub oak (*Quercus berberidifolia*), California ash (*Fraxinus dipetala*), and birchleaf mountain-mahogany are characteristically present as co-dominant or sub-dominant shrubs…

***Heteromeles arbutifolia-Quercus berberidifolia-Cercocarpus betuloides-Fraxinus dipetala* Association**

IC.6. Sugarbush occurs as a dominant or co-dominant or sometimes may be sub-dominant to California buckwheat in an open to intermittent shrub overstory with other shrub species…

***Rhus ovata* Alliance**

IC6.a. Lotebush (*Ziziphus parryi*) usually occurs as a co-dominant while cane cholla and Mojave yucca occur as sub-dominants…

***Rhus ovata-Ziziphus parryi* Association**

IC6.b. Sugarbush occurs as a sub-dominant to co-dominant with California buckwheat, usually in desert transitions sites…

***Eriogonum fasciculatum-Rhus ovata* Association**

I.D. Birchleaf mountain-mahogany occurs as a dominant or co-dominant with other chaparral shrubs, or as a sub-dominant to dominant with California buckwheat…

ID.1. Birchleaf mountain-mahogany occurs as a dominant or co-dominant with other chaparral shrubs in an open to continuous shrub overstory…

***Cercocarpus betuloides* Alliance**

ID1.a. Birchleaf mountain-mahogany usually occurs as a dominant, though shrubs such as toyon, hollyleaf cherry, hollyleaf redberry (*Rhamnus ilicifolia*), black sage, etc, may also occur as sub-dominants …

***Cercocarpus betuloides* Association**

ID1.b. Hollyleaf cherry occurs as a sub-dominant to co-dominant and redshank (*Adenostoma sparsifolium*) is often sub-dominant in the shrub overstory…

***Cercocarpus betuloides-Prunus ilicifolia-Adenostoma sparsifolium* Association**

ID.2. Birchleaf mountain-mahogany often occurs as a co-dominant with California buckwheat in an open to intermittent shrub layer…

***Cercocarpus betuloides-Eriogonum fasciculatum* Alliance**

ID2.a. Birchleaf mountain-mahogany occurs as a sub-dominant to dominant with California buckwheat and other chaparral shrubs may intermix at sparse cover…

***Cercocarpus betuloides-Eriogonum fasciculatum* Association**

ID2.b. Wright's buckwheat characteristically occurs as a sub-dominant in the shrub sub-canopy…

***Cercocarpus betuloides-Eriogonum fasciculatum-Eriogonum wrightii* Association**

ID.3. Birchleaf mountain-mahogany and hoaryleaf ceanothus consistently occur with scrub oak, and all three species are nearly equal in cover. California ash is not present…

***Quercus berberidifolia-Cercocarpus betuloides-Ceanothus crassifolius* Association**

ID4. Birchleaf mountain mahogany occurs as a co-dominant or dominant with muller oak (*Quercus cornelius-mulleri*). If present, redshank occurs at less than 1% cover…

***Quercus cornelius-mulleri-Cercocarpus betuloides* Association**

I.E. Laurel sumac usually occurs as a co-dominant to dominant in an open to intermittent shrub overstory with shrubs such as California buckwheat, black sage (*Salvia mellifera*), or Parry's tetracoccus (*Tetracoccus dioicus*) …

***Malosma laurina* Alliance**

IE.1. California Buckwheat occurs as a co-dominant and other shrubs may occur at low cover…

***Malosma laurina-Eriogonum fasciculatum* Association**

IE.2. California buckwheat and white sage (*Salvia apiana*) occur as sub-dominant to co-dominant shrubs with laurel sumac…

***Malosma laurina-Eriogonum fasciculatum-Salvia apiana* Association**

IE.3. California buckwheat and black sage occur and are usually co-dominant with laurel sumac…

***Malosma laurina-Eriogonum fasciculatum-Salvia mellifera* Association**

IE.4. Parry's tetracoccus is present as a co-dominant or dominant shrub…

***Malosma laurina-Tetracoccus dioicus* Association**

IE.5. California sagebrush is dominant to co-dominant with laurel sumac and the two species provide the main cover in the shrub overstory…

***Artemisia californica-Malosma laurina* Association**

I.F. Eastwood manzanita usually occurs as a dominant in the shrub overstory and chamise or pink-bracted manzanita (*Arctostaphylos pringlei*) may be sub-dominant or co-dominant…

***Arctostaphylos glandulosa* Alliance**

IF.1. Eastwood manzanita occurs as the sole dominant in the shrub overstory, making up at least two-thirds of the total shrub cover. Chamise characteristically occurs as a sub-dominant shrub…

***Arctostaphylos glandulosa* Association**

IF.2. Pink-bracted manzanita occurs as a sub-dominant to co-dominant in the shrub overstory, and chaparral whitethorn (*Ceanothus leucodermis*) may also occur as sub-dominant to co-dominant …

***Arctostaphylos glandulosa-Arctostaphylos pringlei* Association**

I.G. The overstory is dominated by ceanothus (*Ceanothus*) alone or in shared dominance with other broad-leaf evergreen shrubs…

IG.1. Hoaryleaf ceanothus (*Ceanothus crassifolius*) usually occurs as a dominant or as a co-dominant with mission manzanita (*Xylococcus bicolor*), birchleaf mountain-mahogany, and/or laurel sumac…

***Ceanothus crassifolius* Alliance**

IG1.a. Mission manzanita occurs as a sub-dominant to dominant, and other shrubs occur as sub-dominants (including chamise)…

***Ceanothus crassifolius-Adenostoma fasciculatum-Xylococcus bicolor* Association**

IG1.b. Birchleaf mountain-mahogany occurs as a sub-dominant to co-dominant, and other chaparral shrubs may be present…

***Ceanothus crassifolius-Cercocarpus betuloides* Association**

IG1.c. Laurel sumac occurs as a sub-dominant to co-dominant in the shrub overstory. If present, birchleaf mountain-mahogany occurs at trace cover…

***Ceanothus crassifolius-Malosma laurina* Association**

IG.2. Hairlyleaf ceaothus (*Ceanothus oliganthus*) occurs as a dominant or as a co-dominant with yerba santa, chamise, hoaryleaf Ceanothus, and/or eastwood manzanita …

***Ceanothus oliganthus* Alliance**

IG2.a. Yerba santa and chamise characteristically occur as sub-dominants in an intermittent shrub overstory…

***Ceanothus oliganthus-Eriodictyon crassifolium* Association**

IG2.b. Chamise and Hoaryleaf Ceanothus characteristically occur as co-dominant or sub-dominant shrubs in a continuous shrub overstory…

***Ceanothus oliganthus-Adenostoma fasciculatum* Association**

IG2.c. Eastwood manzanita occurs as as a co-dominant with hairyleaf Ceanothus in a continuous shrub overstory…

***Ceanothus oliganthus-Arctostaphylos glandulosa* Association**

IG.3. Wedgeleaf ceanothus (*Ceanothus cuneatus*) occurs as the dominant in an open to intermittent shrub overstory…

***Ceanothus cuneatus* Alliance**

IG.4. Deerbrush (*Ceanothus integerrimus*) is dominant in an intermittent to continuous shrub overstory…

***Ceanothus integerrimus* Alliance**

IG.5. Chaparral whitethorn (*Ceanothus leucodermis*) is usually dominant in an open to continuous shrub overstory. If interior live oak (*Quercus wislizeni*) is present, it occurs at low cover values …

***Ceanothus leucodermis* Alliance**

IG5.a. Chaparral whitethorn is present as a co-dominant to dominant with other shrubs. Interior live oak, California buckwheat, and hollyleaf redberry (*Rhamnus ilicifolia*) are characteristically present at lower cover…

***Ceanothus leucodermis* Association**

I.H. The overstory is dominated by chamise alone or in shared dominance with other chaparral or coastal scrub species in an open to continuous shrub canopy…

IH.1. Mission manzanita occurs as co-dominant or sub-dominant at greater than 1% cover with chamise in an intermittent to continuous shrub overstory…

***Adenostoma fasciculatum-Xylococcus bicolor* Alliance**

IH1.a. Hoaryleaf ceanothus occurs as a sub-dominant or co-dominant with chamise and mission manzanita…

***Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus crassifolius* Association**

IH1.b. Scrub oak occurs as a co-dominant and is similar in cover to both chamise and mission manzanita…

***Adenostoma fasciculatum-Xylococcus bicolor-Quercus berberidifolia* Association**

IH1.c. Black sage and laurel sumac characteristically occur as sub-dominants…

***Adenostoma fasciculatum-Xylococcus bicolor-Salvia mellifera-Malosma laurina* Association**

IH.2. White sage occurs as a sub-dominant to chamise in an intermittent to continuous shrub overstory and, with the exception of California sagebrush, no other shrubs occur as co-dominants…

***Adenostoma fasciculatum-Salvia apiana* Alliance**

IH2.a. California sagebrush occurs as a sub-dominant or co-dominant and, if present, black sage and mission manzanita occur at trace cover…

***Adenostoma fasciculatum-Salvia apiana-Artemisia californica* Association**

IH.3. Chamise usually occurs as a dominant, as a co-dominant with pink-bracted manzanita, California buckwheat, or laurel sumac, or at sparse cover with other shrubs. Mission manzanita is usually absent…

***Adenostoma fasciculatum* Alliance**

IH3.a. Chamise occurs as a sole dominant shrub…

***Adenostoma fasciculatum* Association**

IH3.b. Pink-bracted manzanita occurs as a co-dominant with chamise…

***Adenostoma fasciculatum-Arctostaphylos pringlei* Association**

IH3.c. California buckwheat occurs as a sub-dominant or co-dominant with chamise…

IH3c.i. White sage occurs as a sub-dominant in an open to continuous shrub overstory with chamise and California buckwheat…

***Adenostoma fasciculatum-Eriogonum fasciculatum-Salvia apiana* Association**

IH4c.ii. Chamise and California buckwheat occur in an open to intermittent shrub overstory and white sage is absent…

***Adenostoma fasciculatum-Eriogonum fasciculatum* Association**

IH3.d. Laurel sumac usually occurs as a co-dominant with chamise…

***Adenostoma fasciculatum-Malosma laurina* Association**

IH3.e. Chamise occurs at sparse cover and intermixes with other shrubs such as deerweed (*Lotus scoparius*), chaparral bushmallow (*Malacothamnus fasciculatus*), and yerba santa in an open to intermittent shrub overstory…

***Adenostoma fasciculatum* Disturbance Association**

IH.4. Eastwood manzanita is sub-dominant or co-dominant in an open to continuous shrub overstory…

***Adenostoma fasciculatum-Arctostaphylos glandulosa* Alliance**

IH4.a. Eastwood manzanita usually occurs as a co-dominant with chamise …

***Adenostoma fasciculatum-Arctostaphylos glandulosa* Association**

IH4.b. Eastwood manzanita, chamise, and hoaryleaf ceanothus occur as co-dominants…

***Adenostoma fasciculatum-Arctostaphylos glandulosa-Ceanothus crassifolius* Association**

IH4.c. Chaparral whitethorn occurs as a sub-dominant with Eastwood manzanita and chamise…

***Adenostoma fasciculatum-Arctostaphylos glandulosa-Ceanothus leucodermis* Association**

IH.5. Bigberry manzanita usually occurs as a co-dominant with chamise in an intermittent to continuous shrub overstory and wedgeleaf ceanothus, cupleaf ceanothus, and hoaryleaf ceanothus are absent…

***Adenostoma fasciculatum-Arctostaphylos glauca* Alliance**

IH5.a. Bigberry manzanita occurs as a co-dominant and other chaparral shrubs intermix as sub-dominants…

***Adenostoma fasciculatum-Arctostaphylos glauca* Association**

IH5.b. Sugarbush occurs as a sub-dominant…

***Adenostoma fasciculatum-Arctostaphylos glauca-Rhus ovata* Association**

IH.6. Hoaryleaf ceanothus usually occurs as a co-dominant with chamise in an open to intermittent shrub overstory and Eastwood manzanita is absent…

***Adenostoma fasciculatum-Ceanothus crassifolius* Alliance**

IH6.a. Black sage characteristically occurs as a sub-dominant or co-dominant and is lower in cover than hoaryleaf ceanothus. If present, sugarbush in lower in cover than black sage…

***Adenostoma fasciculatum-Ceanothus crassifolius-Salvia mellifera* Association**

IH6.b. Sugarbush occurs as a sub-dominant and, if present, black sage is lower in cover than sugarbush…

***Adenostoma fasciculatum-Ceanothus crassifolius-Rhus ovata* Association**

IH.7. Wedgeleaf ceanothus occurs as a co-dominant or sub-dominant with chamise in an intermittent shrub overstory. Other shrubs may intermix as sub-dominants…

***Adenostoma fasciculatum-Ceanothus cuneatus* Alliance**

IH.8. Cupleaf ceanothus occurs as a co-dominant with chamise in an intermittent to continuous shrub overstory. Other shrub species may occur as sub-dominants and occasionally as co-dominants …

***Adenostoma fasciculatum-Ceanothus greggii* Alliance and *Adenostoma fasciculatum-Ceanothus greggii* Association**

IH.9. Black sage usually occurs as co-dominant with chamise in an open to continuous shrub overstory. Mission manzanita is absent…

***Adenostoma fasciculatum-Salvia mellifera* Alliance**

IH9.a. California sagebrush occurs as a sub-dominant…
***Adenostoma fasciculatum-Salvia mellifera-Artemisia californica* Association**

IH9.b Hoaryleaf ceanothus occurs as a sub-dominant and is consistently lower in cover than black sage…
***Adenostoma fasciculatum-Salvia mellifera-Ceanothus crassifolius* Association**

IH9.c Relative pure shrubland with chamise and black sage where the total shrub cover varies from sparse to moderately dense. Other shrubs may be present at less than 10% cover, though California sagebrush and hoaryleaf ceanothus are usually absent…
***Adenostoma fasciculatum-Salvia mellifera* Association**

I.I. The overstory is dominated by redshank alone or in shared dominance with other chaparral (including chamise), deciduous, or succulent species in an open to continuous shrub canopy…

II.1. Redshank occurs as a dominant or co-dominant with birchleaf mountain-mahogany, big sagebrush, hoaryleaf ceanothus, wedgeleaf ceanothus, or California buckwheat. If chamise is present, it occurs as a sub-dominant…
***Adenostoma sparsifolium* Alliance**

II1.a. Redshank occurs as a dominant or co-dominant with birchleaf mountain-mahogany…
***Adenostoma sparsifolium-Cercocarpus betuloides* Alliance**

II1a.i. Chamise characteristically occurs at low cover…
***Adenostoma sparsifolium-Cercocarpus betuloides-Adenostoma fasciculatum* Alliance**

II1.b. Big sagebrush occurs as a co-dominant or sub-dominant and no other shrubs occur as co-dominants…
***Adenostoma sparsifolium-Artemisia tridentata* Association**

II1.c. Hoaryleaf ceanothus occurs as a co-dominant or sub-dominant and no other shrubs occur as co-dominants…
***Adenostoma sparsifolium-Ceanothus crassifolius* Association**

II1.d. Wedgeleaf ceanothus occurs as a co-dominant or sub-dominant and birchleaf ceanothus is characteristically present at lower cover than wedgeleaf ceanothus…
***Adenostoma sparsifolium-Ceanothus cuneatus* Association**

II1.e. California buckwheat, deerweed (*Lotus scoparius*), and sugar bush characteristically occur as sub-dominants to co-dominants and no other shrubs occur as co-dominants…
***Adenostoma sparsifolium-Eriogonum fasciculatum-Lotus scoparius* Association**

II1.f. California buckwheat, interior goldenbush, and beavertail cactus characteristically occur as sub-dominants…
Adenostoma sparsifolium-Ericameria linearifolia-Eriogonum fasciculatum-Opuntia basilaris

II.2. Redshank usually occurs with chamise as a co-dominant in an open to continuous shrub layer…
***Adenostoma sparsifolium-Adenostoma fasciculatum* Alliance**

II2.a. Cane cholla occurs as a characteristically present at greater than 1% cover…
***Adenostoma sparsifolium-Adenostoma fasciculatum-Opuntia parryi* Association**

II2.b. Bigberry manzanita occurs as a sub-dominant to co-dominant…
***Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos glauca* Association**

II2.c. Pointleaf manzanita occurs as a sub-dominant or co-dominant. If bigberry manzanita is present, it is lower in cover than pointleaf manzanita…
***Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos pungens* Association**

II2.d. Cupleaf ceanothus occurs as a sub-dominant or co-dominant. If birchleaf mountain-mahogany is present, it is lower in cover than cupleaf ceanothus…
***Adenostoma sparsifolium-Adenostoma fasciculatum-Ceanothus greggii* Association**

<u>Group II</u>. Shrublands dominated mainly by soft-leaved or succulent shrubs that are microphyllous or broad-leaved, and they include cactus, coastal sage scrub, drought-deciduous, summer-deciduous and/or cold-deciduous species. These are generally considered to be part of coastal sage scrub, montane deciduous scrub, desert scrub, or other more soft-leaved shrub habitats. Chaparral species may be present but not dominant. Includes shrub willow (*Salix*), baccharis (*Baccharis*), buckwheat (*Eriogonum*), sagebrush (*Artemisia*), sage (*Salvia*), prickly-pear (*Opuntia*), boxthorn (*Lycium*) , bush mallow (*Malacothamnus*), bush Penstemon (*Keckiella*), desert olive (*Forestiera*), bush seepweed (*Sueada moquinii*), tamarisk (*Tamarix*), etc.

II.A. The shrub overstory is characterized by shrubs that have deciduous or scale-like leaves that are primarily found in riparian or wetland habitats…

IIA.1. Shrublands characterized by the presence of scalebroom (*Lepidospartum squamatum*), where scalebroom is usually dominant but may be co-dominant or sub-dominant with other shrubs…
***Lepidospartum squamatum* Alliance**

IIA1.a. Various mixtures of annual grasses and forbs occur at low to dense cover in the understory of scalebroom, while a variety of other shrub species may occur at sparse cover…
***Lepidospartum squamatum*/*Amsinckia menziesii* Association**

IIA1.b. Fourwing saltbush (*Atriplex canescens*) occurs as a co-dominant or sub-dominant shrub…
***Lepidospartum squamatum-Atriplex canescens* Association**

IIA1.c. Mulefat (*Baccharis salicifolia*) occurs as a sub-dominant to co-dominant shrub with scalebroom and both species occur at low cover. Fourwing saltbush is absent or present at extremely trace cover…
***Lepidospartum squamatum-Baccharis salicifolia* Association**

IIA1.d. California buckwheat (*Eriogonum fasciculatum*) occurs as a sub-dominant to co-dominant…
***Lepidospartum squamatum-Eriogonum fasciculatum* Association**

IIA.2. Shrublands characterized by the dominance of mulefat alone or in shared dominance with other shrubs. An emergent and sparse tree layer may also be present…
***Baccharis salicifolia* Alliance**

IIA2.a. *Baccharis salicifolia* occurs as a dominant or co-dominant with *Sambucus mexicana*, which is characteristic in the shrub overstory…
***Baccharis salicifolia-Sambucus mexicana* Association**

IIA.3. Shrublands in which arroyo willow (*Salix lasiolepis*) is the most dominant and tall shrub, An emergent and sparse tree layer may also be present…
***Salix lasiolepis* Alliance**

IIA.4. Shrublands in which a tamarisk (*Tamarix*) species dominates the canopy, though there may be a minor presence of native shrubs…

***Tamarix* Alliance**

IIA.5. Shrublands in which bush seepweed (*Sueada moquinii*) is dominant…

***Suaeda moquinii* Alliance**

II.B. Shrublands dominated by drought-deciduous or coastal succulent shrubs that are primarily in upland or mesic, coastal sage scrub habitats…

IIB.1. Interior goldenbush is dominant in the canopy sometimes over a higher cover of annual or perennial herbs…

***Ericameria palmeri* Alliance**

IIB.2. Shrubland usually characterized by the dominance of a species of encelia (*Encelia*) alone or in shared dominance with other shrubs. California sagebrush (*Artemisia californica* occasionally may be dominant when encelia has at least 5% cover…

IIB2.a. Shrubland with California encelia (*Encelia californica*) dominant or co-dominant in the canopy…

***Encelia californica* Alliance**

IIB2a.i. California encelia is dominant or has shared dominance with California sagebrush (*Artemisia californica*)*…*

***Encelia californica-Artemisia californica* Association**

IIB2.b. Shrubland with brittlebush (*Encelia farinosa*) usually dominant in the overstory…

***Encelia farinosa* Alliance**

IIB2b.i. Brittlebrush occurs as the sole dominant and other shrubs may intermix at sparse cover*…*

***Encelia farinosa* Association**

IIB2b.ii. California sagebrush usually occurs as a co-dominant but occasionally may be dominant. If California buckwheat is present, it is lower in cover than California sagebrush…

***Encelia farinosa-Artemisia californica* Association**

IIB2b.iii. Brittlebush usually occurs as a sub-dominant to co-dominant with California buckwheat. If California sagebrush is present, it is lower in cover than California buckwheat…

***Eriogonum fasciculatum-Encelia farinosa* Alliance and *E. fasciculatum-E. farinosa* Association**

IIB.3. Shrubland with a succulent coastal species such as pricklypear (*Opuntia*) or iceplant/seafig (e.g., *Carpobrotus*)…

IIB3.a. Coast pricklypear (*Opuntia littoralis*) as a dominant or co-dominant with coastal sage scrub species…

***Opuntia littoralis* Alliance**

IIB.4. Shrubland with bush penstemon (*Keckiella antirrhinoides*) dominant or co-dominant in the shrub overstory…

***Keckiella antirrhinoides* Alliance**

IIB4.a. Shrubland in which bush penstemon is the sole dominant shrub in the shrub overstory. Other shrubs may occur at sparse cover…

***Keckiella antirrhinoides* Association**

IIB4.b. Shrubland in which bush penstemon and California sagebrush provide the main cover in the canopy. Both species are often co-dominant or one species may be sub-dominant to the other. Other coastal sage and chaparral species may be present at low cover, such as California buckwheat, laurel sumac, white sage (*Salvia apiana*), scrub oak, etc. If California buckwheat is present, it is lower in cover than California sagebrush…

***Keckiella antirrhinoides-Artemisia californica* Association**

IIB4.c. Shrubland in which California buckwheat occurs as a co-dominant or sub-dominant in the canopy. If California sagebrush is present, it is lower in cover than California buckwheat…

***Keckiella antirrhinoides-Eriogonum fasciculatum* Association**

IIB4.d. Shrubland in which bush penstemon is co-dominant with chaparral species such as chamise, scrub oak, etc…

***Keckiella antirrhinoides*-Mixed chaparral Association**

IIB.5. Shrubland in which a species of sagebrush (*Artemisia*) is dominant or it is co-dominant with white sage, black sage, California buckwheat, Wrights' buckwheat (*Eriogonum wrightii*), or laurel sumac in the canopy. The shrub canopy is sometimes over a higher cover of annual or perennial herbs such as bromes (*Bromus*), cryptantha (*Cryptantha*), stork's bill (*Erodium*), etc …

IIB5.a. California sagebrush is co-dominant with California buckwheat, and sometimes also with laurel sumac…

***Artemisia californica-Eriogonum fasciculatum* Alliance**

IIB5a.i. California sagebrush and California buckwheat usually co-dominate in the canopy…

***Artemisia californica-Eriogonum fasciculatum* Association**

IIB5a.ii. California buckwheat and laurel sumac occur as sub-dominants to co-dominants with California sagebrush…

***Artemisia californica-Eriogonum fasciculatum-Malosma laurina* Association**

IIB5a.iii. California buckwheat is usually co-dominant with California sagebrush while white sage is sub-dominant to co-dominant…

***Artemisia californica-Eriogonum fasciculatum-Salvia apiana* Association**

IIB5.b. California sagebrush is co-dominant with black sage, and sometimes other shrubs may also be co-dominant…

***Artemisia californica-Salvia mellifera* Alliance**

IIB4b.i. California sagebrush and black sage are the sole dominants in the shrub canopy…

***Artemisia californica-Salvia mellifera* Association**

IIB5.c. California sagebrush is usually co-dominant with white sage. If white sage is sub-dominant to California sagebrush, it has higher cover than other species that intermix in the shrub layer…

***Artemisia californica-Salvia apiana* Alliance**

IIB5.d. California sagebrush is sub-dominant to co-dominant with chamise and white sage and, if present, black sage and mission manzanita occur at trace cover

***Adenostoma fasciculatum-Salvia apiana- Artemisia californica* Association**

IIB5.e. California sagebrush and white sage provide the main cover in the canopy and are usually co-dominant. If white sage is sub-dominant to California sagebrush, it has higher cover than other species that intermix in the shrub layer…

***Artemisia californica-Salvia apiana* Alliance and *A. californica-S. apiana* Association**

IIB5.f. California sagebrush is the sole dominant species in the canopy, or it is sometimes co-dominant with laurel sumac, or it is sometimes over a higher cover of annual or perennial herbs such as fiddleneck (*Amsinckia*), bromes (*Bromus*), cryptantha (*Cryptantha*), stork's bill (*Erodium*), etc…

***Artemisia californica* Alliance**

IIB5f.i. California sagebrush is the sole dominant species in the shrub canopy and sometimes has lower cover than herbs in the herb layer. Menzies' fiddleneck occurs in the herb understory at low to moderate cover…

***Artemisia californicalAmsinckia menziesii* Association**

IIB5f.ii. Laurel sumac is sub-dominant to co-dominant with California sagebrush and the two species provide the main cover in the shrub overstory…

***Artemisia californica-Malosma laurina* Association**

IIB5.g. Big sagebrush (*Artemisia tridentata*) is dominant or co-dominant with California buckwheat…

***Artemisia tridentata* Alliance**

IIB5g.i. Big sagebrush is the sole dominant in the shrub overstory…

***Artemisia tridentata* Association**

IIB5g.ii. California buckwheat is sub-dominant to co-dominant in the shrub canopy…

***Artemisia tridentata-Eriogonum fasciculatum* Association**

IIB5g.iii. Wrights' buckwheat is sub-dominant to co-dominant in the shrub canopy…

***Artemisia tridentata-Eriogonum wrightii* Association**

IIB6. Shrubland in which a Sage (*Salvia*) species is dominant in the canopy or co-dominant with California buckwheat or brittlebush…

IIB6.a. White sage is usually dominant shrub in the canopy…

***Salvia apiana* Alliance**

IIB6a.i. Brittlebush is sub-dominant to co-dominant with California…

***Salvia apiana-Encelia farinosa* Association**

IIB6.b. White sage is sub-dominant to co-dominant with California buckwheat and other shrubs may be present at relatively low cover such as California sagebrush, laurel sumac, bush penstemon, etc…

***Eriogonum fasciculatum-Salvia apiana* Alliance and *E. fasciculatum-S. apiana* Association**

IIB6.c. Black sage is usually dominant in the shrub canopy but may co-dominate with California buckwheat, deerweed (*Lotus scoparius*), sugarbush (*Rhus ovata*), or chamise (*Adenostoma fasciculatum*)…

IIB6c.i. California sagebrush is usually dominant in the shrub overstory, but occasionally may be co-dominant with California buckwheat…

***Salvia mellifera* Alliance and *S. mellifera* Association**

IIB6c.ii. Sugarbush is sub-dominant to co-dominant in the shrub overstory…

***Salvia mellifera-Rhus ovata* Association**

IIB6c.iii. Deerweed is sub-dominant to co-dominant in the shrub overstory and, if present, sugarbush is lower in cover than deerweed…

***Salvia mellifera-Lotus scoparius* Association**

IIB6.d. Black sage usually occurs as co-dominant with chamise in an open to continuous shrub overstory…

***Adenostoma fasciculatum-Salvia mellifera* Alliance**

IIB6d.i. California sagebrush is sub-dominant to chamise and black sage…

***Adenostoma fasciculatum-Salvia mellifera-Artemisia californica* Association**

IIB.7. Shrubland in which a buckwheat (*Eriogonum*) species is dominant in the canopy or is co-dominant with brittlebush, matchweed (*Gutierrezia sarothrae*), cane cholla (*Opuntia parryi*), interior goldenbush (*Ericameria palmeri*), laurel sumac, sugarbush, or chamise. The shrub canopy is sometimes over a higher cover of annual or perennial herbs such as bromes (*Bromus*), cryptantha (*Cryptantha*), stork's bill (*Erodium*), wild oats (*Avena*), etc …

IIB7.a. California buckwheat occurs as a co-dominant with chamise in an open to continuous shrub overstory, and white sage is sub-dominant…

***Adenostoma fasciculatum-Eriogonum fasciculatum-Salvia apiana* Association**

IIB7.b. Chamise and California buckwheat occur in an open to intermittent shrub overstory, and white sage is absent…

***Adenostoma fasciculatum-Eriogonum fasciculatum* Association**

IIB7.c. California Buckwheat occurs as a co-dominant with laurel sumac, and other shrubs may occur at low cover…

***Malosma laurina-Eriogonum fasciculatum* Association**

IIB7.d. California buckwheat is the sole dominant in the canopy, or it is co-dominant with shrubs other than the above species …

***Eriogonum fasciculatum* Alliance**

IIB7d.i. Matchweed occurs as a sub-dominant to co-dominant with California buckwheat, usually in desert transitions sites…

***Eriogonum fasciculatum-Gutierrezia sarothrae* Association**

IIB7d.ii. Cane cholla and jojoba occur as sub-dominants to California buckwheat, usually in desert transitions sites. If sugarbush is present, it is lower in cover than cane cholla and if jojoba is present, it occurs at extremely trace cover…

***Eriogonum fasciculatum-Simmondsia chinensis-Opuntia parryi* Association**

IIB7d.iii. Cane cholla occurs as a sub-dominant to co-dominant with California buckwheat, usually in desert transitions sites. If sugarbush is present, it is lower in cover than cane cholla and if jojoba (*Simmondsia chinensis*) is present, it occurs at extremely trace cover…

***Eriogonum fasciculatum-Opuntia parryi* Association**

IIB7d.iv. Sugarbush occurs as a sub-dominant to co-dominant with California buckwheat, usually in desert transitions sites…

***Eriogonum fasciculatum-Rhus ovata* Association**

IIB7d.v. Bebbia (*Bebbia juncea*) occurs as a sub-dominant with California buckwheat and California brickellbush is characteristically present, usually in desert transitions sites…

***Eriogonum fasciculatum-Bebbia juncea* Association**

IIB7d.vi. California buckwheat is the usually dominant shrub in the canopy, from coastal to inland sites, and sometimes may co-dominate with interior goldenbush…

***Eriogonum fasciculatum* Association**

IIB7d.vii. Brittlebush usually occurs as a sub-dominant to co-dominant with California buckwheat. If California sagebrush is present, it is lower in cover than California buckwheat…
***Eriogonum fasciculatum-Encelia farinosa* Alliance and *E. fasciculatum-E. farinosa* Association**

IIB7.e. Wright's buckwheat is the dominant in the canopy as a sub-shrub, though perennial and annual herbs may be as high or higher in cover…
***Eriogonum wrightii* Alliance**

IIB.8. Shrublands in which other subshrubs or shrubs occur that are usually pioneer species (e.g., *Malacothamnus fasciculatus, Lotus scoparius*) initiated by disturbance such as fire, clearing, or grazing. The shrub canopy is sometimes over a higher cover of annual or perennial herbs such as bromes (*Bromus*), common sandaster (*Lessingia filaginifolia*), needlegrass (*Nassella*), stork's bill, wild oats, etc…

IIB8.a. Deerweed (*Lotus scoparius*) is the dominant shrub species in the canopy…
***Lotus scoparius* Alliance**

IIB8.b. Chaparral mallow (*Malacothamnus fasciculatus*) is the dominant shrub species in the canopy…
***Malacothamnus fasciculatus* Alliance**

IIB8.c. Yerba santa (*Eriodictyon crassifolium*) is the dominant shrub species in the canopy…
***Eriodictyon crassifolium* Alliance**

IIB8.d. Chamise occurs at sparse cover and intermixes with other shrubs such as deerweed (*Lotus scoparius*), chaparral bushmallow (*Malacothamnus fasciculatus*), and yerba santa in an open to intermittent shrub overstory…
***Adenostoma fasciculatum* Disturbance Association**

II.C. Shrublands dominated by cold-deciduous or summer-deciduous species that are found in desert/desert-transition habitats …

IIC.1. Honey mesquite (*Prosopis glandulosa*) is dominant in the canopy as a tall shrub, while a variety of other woody shrubs and cacti may also occur at lower cover…
***Prosopis glandulosa* Alliance**

IIC1.a. Mexican elderberry occurs as a co-dominant or sub-dominant in the shrub canopy…
***Prosopis glandulosa-Sambucus mexicana* Association**

IIC.2. Interior goldenbush is dominant in the canopy sometimes over a higher cover of annual or perennial herbs…
***Ericameria palmeri* Alliance**

IIC.3. Basket bush is the dominant shrub species in the canopy…
***Rhus trilobata* Alliance**

IIC.4. Anderson boxthorn is dominant shrub species in the canopy…
***Lycium andersonii* Alliance**

IIC.5. Shrublands in which bush seepweed (*Sueada moquinii*) is dominant…
***Suaeda moquinii* Alliance**

IIC.6. Desert olive is the dominant shrub species in the canopy…
***Forestiera pubescens* Alliance**

IIC6.a. Mexican elderberry is consistently sub-dominant in the shrub overstory with desert olive...
***Forestiera pubescens-Sambucus mexicana* Association**

<u>Class C.</u> Herbaceous Vegetation

<u>Group I.</u> Vegetation is dominated by mainly wetland and vernal plain, playa, and pool species, including cattail (*Typha*), rush (*Juncus*), sedge (Carex), spikerush (*Eleocharis*), giant reedgrass (*Arundo*), Popcornflower (*Plagiobothrys*), and Barley (*Hordeum*) species. Woody species cover <2% of the ground surface.

I.A. Stands dominated with > 30% absolute cover by wetland grasses and graminoids that are generally > 1 m tall, including cattails (*Typha*), bulrushes and tules (*Scirpus*), and giant reed (*Arundo donax*)…

IA.1. Vegetation where species of bulrush (e.g., *Scirpus americanus, Scirpus acutus*) and cattail (e.g., *Typha domingensis* or *Typha latifolia*) provide the main cover in the herbaceous canopy and either of the two may be sub-dominant to the other…
***Scirpus* spp. – *Typha* spp. Alliance**

IA.2. Dense stands dominated by giant reed, generally small and locally distributed near settlements, agricultural fields, and roads…
***Arundo donax* Alliance**

I.B. Stands dominated by grasses and graminoids that are generally between 0.1-1 m tall, including spikerushes (*Eleocharis*) and rushes (*Juncus*)…

IB.1. Pale spikerush (*Eleocharis macrostachya*) is the dominant in the herb overstory…
***Eleocharis macrostachya* Alliance**

IB1.a. *Downingia* sp. (e.g., *Downingia bella*) and *Eryngium aristulatum* subsp. *parishii* characteristically occur at low cover in vernal pool habitats while *Eleocharis macrostachya* is dominant…
***Eleocharis macrostachya-Eryngium aristulatum* subsp. *parishii* Association**

I.C. Stands dominated (>30% relative cover) by annual or perennial forbs…

IC.1
. Vegetation dominated >30% relative cover by the perennial forb yerba mansa (*Anemopsis californica*)…
***Anemopsis californica* Alliance**

I.D. Vegetation dominated by annual grasses and/or forbs in vernally wet habitats, which have periodic water inundation, such as vernal pools and alkaline flats…
Vernal Alkali Plain, Vernal Pool, and Vernal Playa Habitats

ID.1. Alkali plagiobothrys (*Plagiobothrys leptocladus*) occurs as a dominant to co-dominant with short woolly marbles (*Psilocarphus brevissimus* var. *brevissimus*), typically on vernal alkali plains or in clay rich vernal pools…

***Plagiobothrys leptocladus* Unique Stands**

ID.2. Native grass low barley (*Hordeum depressum*) occurs as a co-dominant to dominant, typically on vernal alkali plains or surrounding clay-rich vernal pools…
***Hordeum depressum* Alliance**

ID2.a. Clustered tarweed and San Jacinto Valley Crownscale (*Atriplex coronata* var. *notatior*) occur at low to moderate cover in seasonally wet habitats, including vernal alkali plains…

***Hordeum depressum-Hemizonia fasciculata- Atriplex coronata* var. *notatior* Association**

ID.3. Native forb California goldfields is dominant, and San Jacinto Valley Crownscale is characteristically present as a sub-dominant…

***Lasthenia californica-Atriplex coronata* var. *notatior* Association**

<u>Group II.</u> Vegetation dominated mainly by upland and mesic herbaceous species, including native and exotic grasses, forbs, cryptogrammic species. If woody species are present, they cover <10% of the ground surface.

II.A. Vegetation is dominated by a mixture of native perennial grasses and annual herbs, with the native perennial grasses usually making up at least 10% relative cover of the herbaceous layer…

IIA.1. Native grass component is usually mainly purple needlegrass (*Nassella pulchra*), and the annual component is a mixture of grasses and forbs…

***Nassella pulchra* Alliance**

IIA1.a. Purple needlegrass co-occurs with wild-oats (*Avena barbata*), stork's bill (*Erodium*), and native herbs such as clarkia (*Clarkia*)…

***Nassella pulchra-Erodium* sp.-*Avena barbata* Association**

IIA.2. Native grass component is dominated by deergrass (*Muhlenbergia rigens*) alone or in shared dominance with other native grasses/graminoids such as blue wildrye (*Elymus glaucus*) and Mexican rush (*Juncus mexicanus*). The annual component is a mixture of grasses and forbs…

***Muhlenbergia rigens* Alliance**

IIA.3. Native grass component is dominated by alkali sacaton (*Sporobolus airoides*) and saltgrass (*Distichlis spicata*) is present. The annual component is a mixture of grasses and forbs…

***Sporobolus airoides* Alliance**

II.B. Vegetation dominated mainly by annual grasses and herbs of various assortments that are in upland habitats…

IIB.1. Cheatgrass (*Bromus tectorum*) is dominant with at least 20% relative cover…

***Bromus tectorum* Alliance**

IIB.2. Red brome or ripgut brome are abundant with other non-native and native species…

California Annual Grassland Alliance

IIB2.a. Foxtail chess (*Bromus madritensis*) is abundant; however, an assortment of other herbs and grasses also usually occur in the stands, including native species such as sun cup (*Camissonia* spp.), common sandaster (*Lessingia filaginifolia*), etc…

***Bromus madritensis*-Mixed Herb Association**

IIB2.b. Ripgut brome (*Bromus diandrus*) is abundant or co-dominant with other non-native grasses. However, other herbs and grasses usually occur in the stands, including native species such as morning glory (*Calystegia*) and rattlesnake weed (*Chamaesyce albomarginata*)…

***Bromus diandrus*-Mixed Herb Association**

II.C. Menzies' fiddleneck is usually co-dominant to dominant (with at least 10% relative cover) and occurs with a variety of annual forbs and herbs in upland habitats…

***Amsinckia menziesii* Alliance**

IIC.1. Menzies' fiddleneck is co-dominant to dominant with species of stork's bill (*Erodium*)…

***Amsinckia menziesii-Erodium* spp. Association**

II.D. Vegetation dominated by species of Tarweed (*Hemizonia*) and an assortment of other forbs and grasses in upland habitats…

IID.1. Clustered tarweed is present at low to dense cover with an assortment of other non-native herbs. Native species intermix as well, and may include California goldfields and Menzies' fiddleneck (*Amsinckia menziesii*)…

***Hemizonia fasciculata*-Annual Grass-Herb Association**

IID.2. Smooth tarplant (*Hemizonia pungens* subsp. *laevis*) is present as a dominant and intermixes with an assortment of non-native and native species, including native species California goldfields and dove weed (*Eremocarpus setigerus*)…

***Hemizonia pungens* subsp. *laevis* Unique Stands**

II.E. Vegetation dominated by California goldfields (*Lasthenia californica*) in upland or seasonally moist habitats…

***Lasthenia californica* Alliance**

IIE.1. Native forb California goldfields is dominant, and San Jacinto Valley Crownscale is characteristically present as a sub-dominant…

***Lasthenia californica-Atriplex coronata* var. *notatior* Association**

II.F. Vegetation dominated by non-native species in the Chenopodiaceae (*Salsola, Kochia, Bassia*) or by non-native perennial pepperweed (*Lepidium latifolium*) in typically disturbed areas that may be alkaline…

IIF.1. Russian thistle (*Salsola tragus*) is dominant…

***Salsola tragus* Alliance**

IIF.2. Kochia is usually dominant or co-dominant in an intermittent to continuous herb canopy…

***Kochia scoparia* Alliance**

IIF2.a. Fivehook bassia (*Bassia hyssopifolia*) is characteristically present and is sub-dominant to dominant with Kochia…

***Kochia scoparia-Bassia hyssopifolia* Association**

IIF.3. Perennial pepperweed is the sole dominant in a continuous herb canopy…

***Lepidium latifolium* Alliance**

TREE-OVERSTORY VEGETATION

Abies concolor-Calocedrus decurrens Alliance (White Fir – Incense Cedar)

ASSOCIATIONS
Abies concolor-Calocedrus decurrens-Pinus jeffreyi

LOCAL VEGETATION DESCRIPTION
Stands of *Abies concolor-Calocedrus decurrens* Woodland form an open tree layer (15-16%, mean 15.5%) at 15-20m tall, an open low shrub layer (9-10%, mean 9.5%) at 0-0.5m tall, and an open herbaceous layer (16-17%, mean 16.5%) at 0-0.5m tall. *Abies concolor* dominates or co-dominates with *Calocedrus decurrens* in the tree layer. Total vegetation cover is 33-35% (mean 34.0%).

In the ***Abies concolor-Calocedrus decurrens-Pinus jeffreyi* Association**, *Abies concolor* may dominate or co-dominate with *Calocedrus decurrens* in the tree overstory, while *Pinus jeffreyi* may be sub-dominant. *Abies concolor* and *Calocedrus decurrens* are often regenerating in the understory. Species that often occupy the herb understory include natives *Claytonia parviflora*, *Claytonia perfoliata*, and *Galium aparine* and non-native *Bromus tectorum*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 6,560-6,650 ft., mean 6,605 ft.
Aspect: NW and variable
Slope: gentle to moderate, range 4-11 degrees, mean 7.5 degrees
Topography: undulating, mid to top slopes
Litter Cover: range 82-93%, mean 87.5%
Rock Cover: range 3-10%, mean 6.5%
Bare Ground: range 0-5%, mean 2.5%
Parent Material: Mesozoic granite
Soil Texture: medium to very fine sandy loam

The *Abies concolor-Calocedrus decurrens* Alliance was sampled in the San Jacinto Mountains (M262Bm) Subsection along relatively gentle slopes of middle montane elevations.

Samples used to describe alliance: (n=2) WRIV0783, WRIV0784

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: montane Peninsular Ranges (including Western Riverside and San Diego Counties) to southern and central montane Sierra Nevada, California

Abies concolor-Calocedrus decurrens-Pinus jeffreyi Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains), though full distribution is not known

REFERENCES
Evens and San In publication, Haultain In publication, Potter 2003

***Abies concolor-Calocedrus decurrens* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	ABCO-t	*Abies concolor*	100	8	8	8
	CADE27-t	*Calocedrus decurrens*	100	4.5	1	8
	PIJE-t	*Pinus jeffreyi*	100	1.5	1	2
Tree Understory	ABCO-m	*Abies concolor*	100	1.1	0.2	2
	CADE27-m	*Calocedrus decurrens*	50	1	2	2
	QUCH2-m	*Quercus chrysolepis*	50	0.1	0.2	0.2
Shrub	ERWR	*Eriogonum wrightii*	50	7	14	14
	LOSU2	*Lonicera subspicata*	50	1.5	3	3
	RIBES	*Ribes*	50	1.5	3	3
	RIQU	*Ribes quercetorum*	50	1.5	3	3
Herb	BRTE	*Bromus tectorum*	100	7.5	5	10
	CLPE	*Claytonia perfoliata*	100	2.5	1	4
	GAAP2	*Galium aparine*	100	1.6	0.2	3
	CLPA5	*Claytonia parviflora*	100	1	1	1
	GILIA	*Gilia*	100	0.6	0.2	1
	LUPIN	*Lupinus*	50	0.5	1	1
	ESCA2	*Eschscholzia californica*	50	0.1	0.2	0.2
	MENTZ	*Mentzelia*	50	0.1	0.2	0.2
	VIPU4	*Viola purpurea*	50	0.1	0.2	0.2

***Abies concolor-Pinus lambertiana* Alliance (White Fir – Sugar Pine)**

ASSOCIATIONS
Abies concolor-Pinus lambertiana-Calocedrus decurrens-Quercus chrysolepis
Abies concolor-Pinus lambertiana-Pinus jeffreyi

LOCAL VEGETATION DESCRIPTION
Stands of *Abies concolor-Pinus lambertiana* Woodland form an open to intermittent tree layer (25-48%, mean 32.5%) at 15-35m tall, where the two species are co-dominant or one is sub-dominant to the other. The shrub layer is open (3-7%, mean 5.5%) at 0.5-5m tall, and the herbaceous layer is sparse (0.2-3%, mean 1.4%) at 0-0.5m tall. Total vegetation cover is 30-50% (mean 37.3%). In this alliance a variety of conifers and hardwoods may intermix in the tree overstory and understory.

In the ***Abies concolor-Pinus lambertiana-Calocedrus decurrens-Quercus chrysolepis* Association,** all four species are characteristically present in the tree layer at low cover. *Rhododendron occidentale* and *Ribes nevadense* are frequently present in the shrub understory at sparse cover.

In the ***Abies concolor-Pinus lambertiana-Pinus jeffreyi* Association,** *Abies concolor* and *Pinus lambertiana* typically co-dominate in the tree overstory, while *Pinus jeffreyi* is often present as a sub-dominant tree.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid to high, range 5,430-8,059 ft., mean 6,508 ft.
Aspect: NW, SE, and variable
Slope: moderate to steep, range, 12-32 degrees mean 24.7 degrees
Topography: concave or undulating, mid to upper slopes
Litter Cover: range 20-85%, mean 54.8%
Rock Cover: range 11-72%, mean 37.8%
Bare ground: range 0-5%, mean 3%
Parent Material: Mesozoic granite
Soil Texture: medium to very fine sandy loam, coarse sand, coarse loamy sand

The *Abies concolor-Pinus lambertiana* Alliance was sampled in the San Jacinto Mountains (M262Bm) Subsection, across middle to upper montane elevations.

Samples used to describe alliance: (n=4) WRIV0864, WRIV0876, WRIV0890, WRIV1018

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: montane Peninsular Ranges (including Western Riverside County: San Jacinto Mountains).
Abies concolor-Pinus lambertiana Forest Alliance in Yosemite

Abies concolor-Pinus lambertiana-Calocedrus decurrens-Quercus chrysolepis Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains), though full distribution is not known
Abies concolor-Pinus lambertiana-Pinus jeffreyi Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains), though full distribution is not known

REFERENCES
NatureServe et al. 2003b

***Abies concolor-Pinus lambertiana* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PILA-t	*Pinus lambertiana*	100	8.5	2	20
	ABCO-t	*Abies concolor*	100	8	2	15
	CADE27-t	*Calocedrus decurrens*	75	4.3	1	9
	QUCH2-t	*Quercus chrysolepis*	50	6	9	15
	PIJE-t	*Pinus jeffreyi*	50	3	5	7
	PIPO	*Pinus ponderosa*	50	1.5	3	3
	UMCA-t	*Umbellularia californica*	25	1.3	5	5
	PICO3-t	*Pinus coulteri*	25	0.5	2	2
	QUKE-t	*Quercus kelloggii*	25	0.1	0.2	0.2
Tree Understory	ABCO-m	*Abies concolor*	75	2.3	1	5
	UMCA-m	*Umbellularia californica*	25	1	4	4
	PILA-m	*Pinus lambertiana*	25	0.5	2	2
	QUCH2-m	*Quercus chrysolepis*	25	0.5	2	2
Shrub	RHOC	*Rhododendron occidentale*	75	2.3	2	5
	RINE	*Ribes nevadense*	75	1.8	1	3
	CELE2	*Ceanothus leucodermis*	50	0.3	0.2	1
	TODI	*Toxicodendron diversilobum*	25	0.3	1	1
	CECO	*Ceanothus cordulatus*	25	0.1	0.2	0.2
Herb	ACMI2	*Achillea millefolium*	25	0.1	0.2	0.2
	AQFO	*Aquilegia formosa*	25	0.1	0.2	0.2
	PESE2	*Pedicularis semibarbata*	25	0.1	0.2	0.2
	POGL9	*Potentilla glandulosa*	25	0.1	0.2	0.2
	THALI2	*Thalictrum*	25	0.1	0.2	0.2
Cryptogam	MOSS	Moss	50	0.5	1	1

***Alnus rhombifolia* Alliance (White Alder)**

ASSOCIATIONS
Alnus rhombifolia
Alnus rhombifolia-Platanus racemosa

LOCAL VEGETATION DESCRIPTION
Stands of *Alnus rhombifolia* Woodland and Forest form an intermittent tree layer (44-65%, mean 54.8%) at 5-35m tall, an open shrub layer (3-15%, mean 11.3%) at 0.5-5m tall, and an open to intermittent herbaceous layer (6-50%, mean 22.8%) at 0-1m tall. *Alnus rhombifolia* dominates or co-dominates in the canopy layer. Other trees that may occur at trace cover include *Pinus jeffreyi*, *Pinus coulteri*, *Quercus kelloggii*, *Quercus chrysolepis*, and *Pinus lambertiana*. Total vegetation cover is 60-94% (mean 74.8%).

In the ***Alnus rhombifolia* Association,** *Alnus rhombifolia* is consistently present and usually dominates, though *Calocedrus decurrens* is sometimes co-dominant. The most common understory species are the shrub *Rosa californica* and herbs *Urtica dioica*, *Pteridium aquilinum*, *Fragaria vesca*, and *Claytonia parviflora*.

In the ***Alnus rhombifolia-Platanus racemosa* Association,** both tree species are co-dominant and may be regenerating in the understory. Other trees may also be co-dominant, including *Quercus agrifolia* and *Salix laevigata*. A variety of herb species may be present in this association (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3,007-5,271 ft., mean 4,469 ft.
Aspect: more often SW, less often SE
Slope: gentle, range 2-5 degrees, mean 3.3 degrees
Topography: concave, bottom to lower slopes
Litter Cover: range 40-75%, mean 55%
Rock Cover: range 10-42%, mean 26.3%
Bare ground: range 0-14%, mean 5.8%
Parent Material: more often Mesozoic granite, less often sedimentary
Soil Texture: medium sand, coarse loamy sand, medium silt

The *Alnus rhombifolia* Alliance was sampled in riparian corridors mainly at middle montane of the San Jacinto Foothills - Cahuilla Mountains (M262Bl) and San Jacinto Mountains (M262Bm) Subsection

Samples used to describe alliance: (n=4) WRIV0850, WRIV0913, WRIV0917, WRIV1010

RANK: G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: inner North Coast, montane North Coast Ranges, Central Coast, low elevations of the Klamath Ranges, foothills to montane Cascade Range, foothills to montane Sierra Nevada (including Yosemite), South Coast, montane Transverse and Peninsular Ranges (including Santa Monica, San Gabriel, San Bernardino, San Jacinto, and San Diego County Mountains), Anza-Borrego Desert

Alnus rhombifolia Association: low montane Sierra Nevada, Peninsular Ranges (Western Riverside County: San Jacinto Mountains Subsection), though full distribution is not known
Alnus rhombifolia-Platanus racemosa Association: Transverse and Peninsular Ranges (Santa Monica Mountains; Western Riverside County: San Jacinto Mountains and San Jacinto Foothills – Cahuilla Mountains Subsections) and potentially north to the Sierra Nevada and Central Coast, though full distribution is not known.

REFERENCES

Boyd et al. 1995, CDFG 1998, CNPS and CDFG 2005b, Evens and San In publication, Hanes 1976, Keeler-Wolf 1990, Minnich 1976, NatureServe et al. 2003b, Potter 2003, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Alnus rhombifolia* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	ALRH2	*Alnus rhombifolia*	100	34.5	20	60
	CADE27-t	*Calocedrus decurrens*	50	6	7	17
	PIJE-t	*Pinus jeffreyi*	50	1.3	1	4
	PICO3-t	*Pinus coulteri*	50	0.8	1	2
	PLRA-t	*Platanus racemosa*	25	5.3	21	21
	SALA3-t	*Salix laevigata*	25	3.3	13	13
	QUAG-t	*Quercus agrifolia*	25	2.5	10	10
	QUKE-t	*Quercus kelloggii*	25	0.8	3	3
	POFR2-t	*Populus fremontii*	25	0.5	2	2
	QUCH2-t	*Quercus chrysolepis*	25	0.5	2	2
	PILA-t	*Pinus lambertiana*	25	0.3	1	1
Tree Understory	QUCH2-m	*Quercus chrysolepis*	25	0.8	3	3
	PLRA-m	*Platanus racemosa*	25	0.5	2	2
	QUWI2-m	*Quercus wislizeni*	25	0.3	1	1
Shrub	ROCA2	*Rosa californica*	50	4.3	2	15
	RHIL	*Rhamnus ilicifolia*	50	0.6	0.2	2
	RHOC	*Rhododendron occidentale*	25	3	12	12
	TODI	*Toxicodendron diversilobum*	25	1.5	6	6
	HEAR5	*Heteromeles arbutifolia*	25	1.3	5	5
	EUOC8	*Euonymus occidentalis*	25	0.5	2	2
	PHORA	*Phoradendron*	25	0.5	2	2
	BASA4	*Baccharis salicifolia*	25	0.3	1	1
	LOSU2	*Lonicera subspicata*	25	0.3	1	1
	RHCA	*Rhamnus californica*	25	0.3	1	1
	SALA6-m	*Salix lasiolepis*	25	0.3	1	1
	KECO	*Keckiella cordifolia*	25	0.1	0.2	0.2
	PRIL	*Prunus ilicifolia*	25	0.1	0.2	0.2
	RINE	*Ribes nevadense*	25	0.1	0.2	0.2
Herb	URDI	*Urtica dioica*	100	7.3	0.2	25
	BRDI3	*Bromus diandrus*	50	3.8	3	12
	CAREX	*Carex*	50	1.5	1	5
	ARDO3	*Artemisia douglasiana*	50	1.3	0.2	5
	PTAQP2	*Pteridium aquilinum* var. *pubescens*	50	1.3	1	4
	CLPA5	*Claytonia parviflora*	50	1	1	3
	FRVE	*Fragaria vesca*	50	0.6	0.2	2

***Alnus rhombifolia* Alliance** continued

Stratum	Code	Species Name	Con	Avg	Min	Max
Herb	STAL	*Stachys albens*	25	1.8	7	7
	BRTE	*Bromus tectorum*	25	1.3	5	5
	SCMI2	*Scirpus microcarpus*	25	1	4	4
	JUNCU	*Juncus*	25	0.8	3	3
	JUEF	*Juncus effusus*	25	0.5	2	2
	ACMI2	*Achillea millefolium*	25	0.1	0.2	0.2
	ATFI	*Athyrium filix-femina*	25	0.1	0.2	0.2
	EQAR	*Equisetum arvense*	25	0.1	0.2	0.2
	GAAP2	*Galium aparine*	25	0.1	0.2	0.2
	MIGU	*Mimulus guttatus*	25	0.1	0.2	0.2
	POGL9	*Potentilla glandulosa*	25	0.1	0.2	0.2
	SCCA2	*Scrophularia californica*	25	0.1	0.2	0.2

***Calocedrus decurrens* Alliance (Incense Cedar)**

ASSOCIATIONS
Calocedrus decurrens-Quercus chrysolepis-Quercus kelloggii

LOCAL VEGETATION DESCRIPTION
Stands of *Calocedrus decurrens* Woodland and Forest form an intermittent to continuous tree layer (60-71%, mean 65.5%) at 10-15m tall, an open shrub layer (1%, mean 1%) at 1-2m tall, and an open herbaceous layer (1-4%, mean 2.5%) at 0-0.5m tall. *Calocedrus decurrens* dominates or co-dominates in the tree layer and is occasionally regenerating in the understory. Total vegetation cover is 61-70% (mean 65.5%).

In the ***Calocedrus decurrens-Quercus chrysolepis-Quercus kelloggii* Association,** all three tree species are consistently present in the overstory, where *Calocedrus decurrens* dominates or co-dominates with *Quercus kelloggii*. *Pinus jeffreyi*, *Quercus chrysolepis*, and *Pinus coulteri* also characteristically occur at low cover in the tree layer. All tree species may be regenerating in the understory. The most common understory species include shrub *Ribes quercetorum* and native forb *Galium aparine*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4,492-5,300 ft., mean 4,896 ft.
Aspect: NE and NW
Slope: somewhat steep to steep, range 24-30 degrees, mean 27 degrees
Topography: concave or flat, lower to upper slopes
Litter Cover: range 90-95%, mean 92.5%
Rock Cover: range 0-2%, mean 1%
Bare ground: range 0-4%, mean 2%
Parent Material: Mesozoic granite
Soil Texture: medium to very fine sandy loam

The *Calocedrus decurrens* Alliance was sampled within the mid montane of the San Jacinto Mountains (M262Bm) Subsection along north-trending, steep slopes.

Samples used to describe alliance: (n=2) WRIV0844, WRIV0898

RANK: G4 S4 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: montane North and Central Coast, montane Klamath Ranges, montane Cascade Range, montane Sierra Nevada (including Yosemite), montane Transverse and Peninsular Ranges (including Western Riverside and San Diego Counties), Baja California

Calocedrus decurrens-Quercus chrysolepis-Quercus kelloggii Association: sporadically occurring in the Peninsular Ranges (including San Diego County: Palomar - Cuyamaca Peak region; Western Riverside County: San Jacinto Mountains). Potentially occurs north to montane Sierra Nevada, Klamath Range, and Cascade Range, as a transitional association between hardwood oak associations and other mixed-conifer and hardwood association.

REFERENCES
Evens and San In publication, NatureServe et al. 2003b, Potter 2003, Sawyer and Keeler-Wolf 1995

***Calocedrus decurrens* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	CADE27-t	*Calocedrus decurrens*	100	32.5	10	55
	QUKE-t	*Quercus kelloggii*	100	13.5	7	20
	PIJE-t	*Pinus jeffreyi*	100	5	2	8
	QUCH2-t	*Quercus chrysolepis*	100	4.5	4	5
	PICO3-t	*Pinus coulteri*	100	0.6	0.2	1
	ABCO-t	*Abies concolor*	50	0.5	1	1
Tree Understory	QUKE-m	*Quercus kelloggii*	100	4.1	0.2	8
	QUCH2-m	*Quercus chrysolepis*	100	2.1	0.2	4
	CADE27-m	*Calocedrus decurrens*	50	10	20	20
	CADE27-l	*Calocedrus decurrens*	50	1	2	2
	ABCO-m	*Abies concolor*	50	0.1	0.2	0.2
	QUCH-l	*Quercus chrysolepis*	50	0.1	0.2	0.2
	QUKE-l	*Quercus kelloggii*	50	0.1	0.2	0.2
	QUWI2-l	*Quercus wislizeni*	50	0.1	0.2	0.2
Shrub	RIQU	*Ribes quercetorum*	50	0.1	0.2	0.2
Herb	GAAP2	*Galium aparine*	100	1.6	0.2	3
	BRTE	*Bromus tectorum*	50	0.5	1	1
	NEME	*Nemophila menziesii*	50	0.5	1	1
	CLPA5	*Claytonia parviflora*	50	0.1	0.2	0.2

***Eucalyptus* spp. Alliance (Eucalyptus)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Reconnaissance of *Eucalyptus* dominated stands show *Eucalyptus* spp. Woodland forming an open to intermittent tree layer at 10-15m tall. One or more *Eucalyptus* species dominate the tree layer, such as *Eucalyptus camaldulensis*. *Quercus agrifolia* and non-native trees and shrubs, such as *Phoenix dactilifera, Schinus,* and *Tamarix* may intermix at low to moderate cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: no data
Aspect: no data
Slope: no data
Topography: no data
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed alluvium
Soil Texture: no data

The *Eucalyptus* spp. Alliance was sampled in the Santa Ana Mountains (M262Bf), Fontana Plain - Calimesa Terraces (M262Bj, Perris Valley and Hills (M262Bk), and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections.

Reconnaissance samples used to describe alliance: (n=22) RECN0701, RECN0803, RECN1172, RECN1537, RECN1658, RECN1836, RECN1925, RECN1939, RECN1969, RECN1996, RECN2060, RECN2071, RECN2081, RECN2296, RECN2315, RECN2322, RECN2323, RECN2399, RECN2925, RECN2928, RECN3096, RECN3098

RANK: none, invasive

GLOBAL DISTRIBUTION
Alliance: outer North Coast, Central to South Coast (including Marin County south to San Diego County), Central Valley, Transverse and Peninsular Ranges, Channel Islands; native to Australia

REFERENCES
CNPS and CDFG 2005b, Evens and San In Publication, NatureServe et al. 2003a, Sawyer and Keeler-Wolf 1995

***Pinus attenuata* Alliance (Knobcone Pine)**

ASSOCIATIONS
Pinus attenuata/*Arctostaphylos glandulosa*

LOCAL VEGETATION DESCRIPTION
Stands of *Pinus attenuata* Woodland form an open to intermittent tree layer (20-35%, mean 25.7%) at 2-10m tall, where *Pinus attenuata* typically dominates. The shrub layer is open to intermittent (4-55%, mean 34.7%) at 0.5-2m tall, and the herbaceous layer is open to intermittent (0.2-38%, mean 19.1%) at 0-0.5m tall. Total vegetation cover is 64-69% (mean 67%).

In the ***Pinus attenuata*/*Arctostaphylos glandulosa* Association,** *Pinus attenuata* is consistently present in the overstory as a dominant or co-dominant tree. *Pinus coulteri* sometimes may occur in the tree layer as a co-dominant. In the shrub understory, *Arctostaphylos glandulosa* is consistently present at low to moderate cover and may co-occur with other chaparral shrubs (e.g., *Adenostoma fasciculatum*, *Quercus berberidifolia*). Non-native annuals *Bromus hordeaceus* and *Brassica nigra* are occasionally present in the herb understory.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 3,642-3,744 ft., mean 3,681 ft.
Aspect: usually NE or variable
Slope: moderate to steep, range 15-35 degrees, mean 23.3 degrees
Topography: undulating, mid to top slopes
Litter Cover: range 20-85%, mean 58.3%
Rock Cover: range 0-13%, mean 6.5%
Bare ground: range 3-16%, mean 11.3%
Parent Material: sedimentary
Soil Texture: medium loam, moderately fine sandy clay loam

The *Pinus attenuata* Alliance was sampled only in the Santa Ana Mountains (M262Bf) Subsection at low to middle elevations on moderately steep slopes that are usually NE-trending.

Samples used to describe alliance: (n=3) WRIV0374, WRIV0379, WRIV0383

RANK: G2 S2, G4 S4

GLOBAL DISTRIBUTION
Alliance: inner North Coast, montane North Coast, Central Coast, low elevations of the Klamath Ranges, Klamath Foothills, montane Klamath Ranges, Cascade Range foothills, montane Cascade Ranges, montane Sierra Nevada (including Yosemite), montane Transverse Ranges (including San Bernardino Mountains), western montane Peninsular Ranges (including Western Riverside County: Santa Ana Mountains), Modoc Plateau, Baja CA, Oregon.

Pinus attenuata/*Arctostaphylos glandulosa* Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains), though full distribution is not known. This association is largely restricted to gabbro or serpentine in the Santa Ana Mountains.

REFERENCES
Alexander et al. In Publication, Minnich 1976, NatureServe et al. 2003b, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Pinus attenuata* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PIAT	*Pinus attenuata*	100	19.7	17	22
	PICO3-t	*Pinus coulteri*	33.3	6.3	19	19
Shrub	ARGL3	*Arctostaphylos glandulosa*	100	28.7	2	54
	ADFA	*Adenostoma fasciculatum*	66.7	4.4	0.2	13
	DERI	*Dendromecon rigida*	66.7	0.4	0.2	1
	QUBE5	*Quercus berberidifolia*	66.7	0.4	0.2	1
	MIAU	*Mimulus aurantiacus*	33.3	0.7	2	2
	ERFA2	*Eriogonum fasciculatum*	33.3	0.3	1	1
	GAFL2	*Garrya flavescens*	33.3	0.3	1	1
	HEAR5	*Heteromeles arbutifolia*	33.3	0.1	0.2	0.2
Herb	BRHO2	*Bromus hordeaceus*	33.3	5	15	15
	BRNI	*Brassica nigra*	33.3	0.3	1	1

***Pinus contorta* Alliance (Lodgepole Pine)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
One stand of *Pinus contorta* var. *murrayana* Woodland forms an open coniferous tree layer (28%) at 10-15m tall, where *Pinus contorta* var. *murrayana* dominates and may be regenerating in the understory. The shrub layer is open (0.2%) at 0.5-1m tall, and the herbaceous layer is open (0.2%) at 0-0.5m tall. Total vegetation cover is 28%.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: high, 9,229 ft.
Aspect: NW
Slope: somewhat steep, 25 degrees
Topography: undulating, upper slope
Litter Cover: 20%
Rock Cover: 75%
Bare ground: range 2%
Parent Material: Mesozoic granite
Soil Texture: coarse loamy sand

The *Pinus contorta* Alliance was sampled only in the upper montane of the San Jacinto Mountains (M262Bm) Subsection on a NW-trending slope.

Samples used to describe alliance: (n=1) WRIV1016

RANK: G5 S5

GLOBAL DISTRIBUTION
Alliance: low, montane, and subalpine elevations of the Klamath Ranges, montane and subalpine Cascade Ranges, montane and subalpine Sierra Nevada (including Yosemite), subalpine Transverse Ranges (including San Bernardino Mountains), subalpine Peninsular Ranges (including Western Riverside County: San Jacinto Mountains), Modoc Plateau, Warner Range, eastside Sierra and valleys, subalpine White, Inyo, Sweetwater Ranges, Baja CA.

REFERENCES
Hanes 1976, Minnich 1976, NatureServe et al. 2003b, Potter 2003, Sawyer and Keeler-Wolf 1995

***Pinus contorta* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PICOM-t	*Pinus contorta* var. *murrayana*	100	25	25	25
	PIFL2	*Pinus flexilis*	100	3	3	3
Tree Understory	PICOM-m	*Pinus contorta* var. *murrayana*	100	0.2	0.2	0.2
Shrub	CHSE11	*Chrysolepis sempervirens*	100	0.2	0.2	0.2
Herb	CARO5	*Carex rossii*	100	0.2	0.2	0.2

***Pinus coulteri* Alliance (Coulter Pine)**

ASSOCIATIONS
Pinus coulteri/*Arctostaphylos glandulosa-Quercus wislizeni*
Pinus coulteri/*Quercus wislizeni*

LOCAL VEGETATION DESCRIPTION
Stands of *Pinus coulteri* Woodland form an open to intermittent tree layer (4-47%, mean 24.5%) at 5-35m tall, where *Pinus coulteri* usually dominates and may be regenerating in the understory. The shrub layer is open to intermittent at (1-62%, mean 32.2%) at 0-5m tall, and the herbaceous layer is open to intermittent (0.2-65%, mean 21%) at 0-1m tall. Total vegetation cover is 14-93% (mean 65.1%).

In the ***Pinus coulteri*/*Arctostaphylos glandulosa-Quercus wislizeni* Association,** *Pinus coulteri* is the sole dominant species in the tree overstory. *Quercus chrysolepis* and *Quercus kelloggii* may be present in the tree layer at sparse cover. In the understory shrub layer, *Arctostaphylos glandulosa* is consistently present as a dominant or co-dominant shrub, while *Quercus wislizeni* is characteristically present as a sub-dominant or co-dominant. Other chaparral shrubs that often intermix as sub-dominants or co-dominants include *Ceanothus leucodermis* and *Heteromeles arbutifolia*. Native and non-native species occupy the herb understory (see species table).

In the ***Pinus coulteri*/*Quercus wislizeni* Association,** *Pinus coulteri* is consistently present in the tree overstory usually as the dominant. *Quercus wislizeni* is consistently present and sometimes may occur as a co-dominant overstory tree or understory shrub. Other tree species that may be present at trace cover include *Quercus chrysolepis*, *Quercus agrifolia*, and *Calocedrus decurrens*. *Adenostoma sparsifolium* and *Cercocarpus betuloides* occur often at sparse cover in the shrub understory. The most common species in the open herb understory is non-native grass *Bromus tectorum*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2,668-5,476 ft., mean 4,289 ft.
Aspect: more often NW and SW, less often SE and variable
Slope: gentle to moderate, range 2-42 degrees, mean 14.2 degrees
Topography: more often undulating, less often concave or convex, bottom to upper slopes
Litter Cover: range 2-96%, mean 55.2%
Rock Cover: range 0-96%, mean 27.5%
Bare ground: range 0-50%, mean 12%
Parent Material: more often Mesozoic granite, less often mixed granitic or alluvium
Soil Texture: more often medium to very fine sandy loam, less often coarse loamy sand or moderately coarse sandy loam

The *Pinus coulteri* Alliance was sampled primarily in the middle montane of the Santa Ana Mountains (M262Bf) and San Jacinto Mountains (M262Bm) Subsections.

Samples used to describe alliance: (n=13) WRAA.074, WRAA.141, WRIV0243, WRIV0290, WRIV0327, WRIV0329, WRIV0606, WRIV0724, WRIV0747, WRIV0748, WRIV0752, WRIV0759, WRIV0841

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: montane Central Coast (including San Benito County), inner South Coast, montane Transverse and Peninsular Ranges (including San Bernardino, Santa Ana, San Jacinto, and San Diego County Mountains), Anza-Borrego Desert

Pinus coulteri/*Arctostaphylos glandulosa-Quercus wislizeni* Association: Peninsular Ranges (Western Riverside County: San Jacinto and Santa Ana Mountains), though full distribution is not known

Pinus coulteri-Quercus kelloggii Association: Peninsular Ranges (including San Diego County: Palomar - Cuyamaca Peak region; Western Riverside County: San Jacinto and Santa Ana Mountains), though full distribution is not known

REFERENCES

Borchert 2004, CDFG 1998, CNPS and CDFG 2005a, Evens and San In publication, Hanes 1976, Keeler-Wolf 1990, Minnich 1976, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Pinus coulteri* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PICO3-t	*Pinus coulteri*	100	21	4	45
	QUCH2-t	*Quercus chrysolepis*	30.8	1.2	2	8
Tree Understory	QUWI2-m	*Quercus wislizeni*	53.8	4.6	3	22
Shrub	CEBE3	*Cercocarpus betuloides*	53.8	1.8	0.2	17
	ARGL3	*Arctostaphylos glandulosa*	46.2	11	9	40
	ERFA2	*Eriogonum fasciculatum*	46.2	1.2	0.2	5
	ADFA	*Adenostoma fasciculatum*	38.5	2.5	0.2	27
	CELE2	*Ceanothus leucodermis*	30.8	1.8	1	15
	HEAR5	*Heteromeles arbutifolia*	30.8	1.2	0.2	11
	QUBE5	*Quercus berberidifolia*	23.1	2	2	22
	SALA6-m	*Salix lasiolepis*	23.1	1.6	1	18
	ARTR2	*Artemisia tridentata*	23.1	1.2	3	8
	ADSP	*Adenostoma sparsifolium*	23.1	0.5	1	3
	LOSU2	*Lonicera subspicata*	23.1	0.2	1	1
	RHIL	*Rhamnus ilicifolia*	23.1	0.2	0.2	1
	RHOV	*Rhus ovata*	23.1	0.2	0.2	1
Herb	BRTE	*Bromus tectorum*	46.2	6.4	0.2	30
	BRDI3	*Bromus diandrus*	15.4	0.9	1	11
	BRHO2	*Bromus hordeaceus*	15.4	0.6	0.2	8
	GAAN2	*Galium angustifolium*	15.4	0	0.2	0.2

***Pinus coulteri-Quercus chrysolepis* Alliance (Coulter Pine – Canyon Live Oak)**

ASSOCIATIONS
Pinus coulteri-Quercus chrysolepis/*Arctostaphylos pringlei*

LOCAL VEGETATION DESCRIPTION
Stands of *Pinus coulteri-Quercus chrysolepis* Woodland and Forest form an open to intermittent tree layer (16-62%, mean 38.5%) at 5-35m tall, an open shrub layer (5-28%, mean 14.1%) at 0-5m tall, and an open herbaceous layer (0.2-33%, mean 5.9%) at 0-0.5m tall. *Quercus chrysolepis* dominates or co-dominates in the tree layer, while *Pinus coulteri* is characteristically present as a sub-dominant or co-dominant. Total vegetation cover is 21-76% (mean 52.1%).

In the ***Pinus coulteri-Quercus chrysolepis*/*Arctostaphylos pringlei* Association,** *Pinus lambertiana* and *Quercus kelloggii* are characteristically present in the tree overstory and are sometimes co-dominant. Other species that may be present as sub-dominant or co-dominant trees include *Calocedrus decurrens*, *Pinus ponderosa*, *Pinus jeffreyi*, *Abies concolor*, and *Quercus wislizeni*. All tree species may be regenerating in the understory. *Arctostaphylos pringlei* is characteristically present in the shrub layer as the dominant shrub species at low to moderate cover. A variety of native and non-native species occupy the open herb understory (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4,704-6,800 ft., mean 5,872 ft.
Aspect: variable but more often NW or SW
Slope: gentle to steep, range 5-28 degrees, mean 17.2 degrees
Topography: variable, but more often undulating, lower to top slopes
Litter Cover: range 25-92%, mean 63.6%
Rock Cover: range 1-58%, mean 24.5%
Bare ground: range 1-20%, mean 7.8%
Parent Material: most often Mesozoic granite, infrequently sedimentary
Soil Texture: more often moderately coarse sandy loam or medium to very fine sandy loam, less often coarse loamy sand

The *Pinus coulteri-Quercus chrysolepis* Alliance was sampled only in the San Jacinto Mountains (M262Bm) Subsection in the middle montane on variable slopes.

Samples used to describe alliance: (n=16) WRAA.071, WRIV0731, WRIV0848, WRIV0877, WRIV0878, WRIV0879, WRIV0880, WRIV0885, WRIV0886, WRIV0887, WRIV0888, WRIV0889, WRIV0896, WRIV0897, WRIV0899, WRIV0912

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: montane Central Coast (including San Benito County), montane Transverse and Peninsular Ranges (including Western Riverside County: San Jacinto Mountains; San Diego County: Palomar - Cuyamaca Peak region), Anza-Borrego Desert, Baja California

Pinus coulteri-Quercus chrysolepis/*Arctostaphylos pringlei* Association: Peninsular Ranges (Western Riverside County: middle montane San Jacinto Mountains), though full distribution is not known.

REFERENCES
CDFG 1998, CNPS and CDFG 2005a, Evens and San In publication, Sawyer and Keeler-Wolf 1995

***Pinus coulteri-Quercus chrysolepis* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	QUCH2-t	*Quercus chrysolepis*	100	18.4	1	50
	PICO3-t	*Pinus coulteri*	100	9.2	1	30
	QUKE-t	*Quercus kelloggii*	75	4.9	1	18
	PILA-t	*Pinus lambertiana*	75	1.8	0.2	8
	CADE27-t	*Calocedrus decurrens*	62.5	2.2	1	22
	PIPO	*Pinus ponderosa*	43.8	1.4	1	7
	PIJE-t	*Pinus jeffreyi*	43.8	1.3	1	4
	ABCO-t	*Abies concolor*	31.3	0.3	0.2	2
Tree Understory	QUCH2-m	*Quercus chrysolepis*	50	2.1	1	8
	QUWI2-m	*Quercus wislizeni*	25	1.6	2	10
Shrub	ARPR	*Arctostaphylos pringlei*	87.5	7.3	1	22
	ERWR	*Eriogonum wrightii*	25	0.4	1	3
Herb	BRTE	*Bromus tectorum*	43.8	2.6	1	25
	GAAN2	*Galium angustifolium*	25	0.1	0.2	1
	CLPA5	*Claytonia parviflora*	18.8	0.6	2	4
	CRYPT	*Cryptantha*	18.8	0.3	1	2
	CRMI	*Cryptantha micrantha*	18.8	0.1	0.2	1
	MEIM	*Melica imperfecta*	18.8	0.1	0.2	1
	LICI	*Linanthus ciliatus*	18.8	0	0.2	0.2
Epiphyte	PHVI9	*Phoradendron villosum*	25	0.6	1	3

***Pinus flexilis* Alliance (Limber Pine)**

ASSOCIATIONS
Pinus flexilis-Pinus contorta/*Chrysolepis sempervirens*

LOCAL VEGETATION DESCRIPTION
Stands of *Pinus flexilis* Woodland form an open tree layer (15%, mean 15%) at 10-15m tall, where *Pinus flexilis* usually dominates. The shrub layer is intermittent to continuous (65-67%, mean 66%) at 0.5-1m tall, and the herbaceous layer is open (0.2%, mean 0.2%) at 0-0.1m tall. Total vegetation cover is 70-80% (mean 75%).

In the ***Pinus flexilis-Pinus contorta*/*Chrysolepis sempervirens* Association,** *Pinus flexilis* and *Pinus contorta* var. *murrayana* create an open conifer canopy over moderately dense *Chrysolepis sempervirens*. *Abies concolor* and *Pinus lambertiana* may be present in the overstory/understory tree layer. *Ceanothus cordulatus* and *Pteridium aquilinum* may be present in the understory shrub and herb layers, respectively.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: high, range 9,144-9,572 ft., mean 9,358 ft.
Aspect: NW and SE
Slope: steep, range 30-32 degrees, mean 31 degrees
Topography: undulating, upper to top slopes
Litter Cover: range 20-40%, mean 30%
Rock Cover: range 50-70%, mean 60%
Bare Ground: 5%, mean 5%
Parent Material: Mesozoic granite
Soil Texture: coarse sand, coarse sandy loam

The *Pinus flexilis* Alliance was sampled only in the upper montane of the San Jacinto Mountains (M262Bm) Subsection on neutral steep slopes.

Samples used to describe alliance: (n=2) WRIV1015, WRIV1017

RANK: G5 S5

GLOBAL DISTRIBUTION
Alliance: southern subalpine Sierra Nevada, subalpine Transverse and Peninsular Ranges (including Western Riverside County), subalpine White, Inyo, and Sweetwater Ranges, subalpine Desert Ranges (including Mojave Desert)

Pinus flexilis-Pinus contorta/*Chrysolepis sempervirens* Association: Peninsular Ranges (Western Riverside: upper montane of San Jacinto Mountains), though full distribution is not known.

REFERENCES
Hanes 1976, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004, Vogl 1976

***Pinus flexilis* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PIFL2	*Pinus flexilis*	100	8.5	7	10
	PICOM-t	*Pinus contorta* var. *murrayana*	100	3	1	5
	ABCO-t	*Abies concolor*	50	3.5	7	7
	PILA-t	*Pinus lambertiana*	50	0.1	0.2	0.2
Tree Understory	ABCO-m	*Abies concolor*	100	1.6	0.2	3
Shrub	CHSE11	*Chrysolepis sempervirens*	100	63	63	63
	CECO	*Ceanothus cordulatus*	100	3.5	3	4
Herb	PTAQP2	*Pteridium aquilinum* var. *pubescens*	100	0.2	0.2	0.2

***Pinus jeffreyi* Alliance (Jeffrey Pine)**

ASSOCIATIONS
Pinus jeffreyi/*Artemisia tridentata*/*Penstemon centranthifolius*
Pinus jeffreyi/*Quercus palmeri*
Pinus jeffreyi/*Quercus wislizeni*
Pinus jeffreyi-Quercus kelloggii
Pinus jeffreyi-Abies concolor/*Chrysolepis sempervirens*

LOCAL VEGETATION DESCRIPTION
Stands of *Pinus jeffreyi* Woodland form an open to intermittent tree layer (1-55%, mean 23.2%) at 5-35m tall. *Pinus jeffreyi* is usually dominant in the overstory or may be co-dominant with *Abies concolor* and is sometimes regenerating in the understory. *Quercus kelloggii, Quercus chrysolepis*, *Pinus coulteri*, and *Calocedrus decurrens* and are some examples of conifer and hardwood species that may be found in the tree overstory and understory. The shrub layer is open to intermittent (4-55%, mean 24.7 %) at 0-5m tall, and the herbaceous layer is open to intermittent (0.2-60%, mean 23.6%) at 0-1m tall. Total vegetation cover is 34-88% (mean 59.7%).

In the ***Pinus jeffreyi*/*Artemisia tridentata*/*Penstemon centranthifolius* Association,** the understory shrub layer is dominated by *Artemisia tridentata* while *Arctostaphylos pungens*, *Ceanothus cuneatus*, *Eriogonum fasciculatum*, are often present. *Penstemon centranthifolius* frequents the herb layer at sparse cover.

In the ***Pinus jeffreyi*/*Quercus palmeri* Association,** *Pinus jeffreyi* occupies an open conifer overstory over characteristically present shrubs *Quercus palmeri*, *Arctostaphylos pungens*, and *Cercocarpus betuloides*. *Pinus quadrifolia*, *Artemisia tridentata* and *Eriogonum wrightii* are examples of conifer and shrub species that are often present.

In the ***Pinus jeffreyi*/*Quercus wislizeni* Association,** a variety of conifer and hardwood species (e.g., *Pinus coulteri*, *Pinus ponderosa*, *Abies concolor*, *Calocedrus decurrens*, *Quercus kelloggii*) may intermix in the tree overstory at sparse cover. *Quercus wislizeni* and *Quercus chrysolepis* are characteristically present in the shrub/tree layer.

In the ***Pinus jeffreyi-Quercus kelloggii* Association,** *Quercus kelloggii* may be co-dominant or sub-dominant. *Quercus chrysolepis*, *Calocedrus decurrens*, and *Pinus coulteri* may intermix in the tree overstory at sparse cover. The most common understory shrubs include *Quercus wislizeni*, *Ceanothus leucodermis*, *Lonicera subspicata*, and *Arctostaphylos pungens*.

In the ***Pinus jeffreyi-Abies concolor*/*Chrysolepis sempervirens* Association**, *Abies concolor* and *Pinus jeffreyi* consistently co-dominate in the overstory tree layer and are frequently regenerating in the understory. *Pinus lambertiana* is characteristically present and subdominant in the tree layer, while *Pinus contorta* var. *murrayana* is occasionally co-dominant. *Chrysolepis sempervirens* and *Ceanothus cordulatus* are consistent in the shrub layer, while other shrubs such as *Ribes nevadense* and *Arctostaphylos patula* are often present. The most common herbs include natives *Lupinus formosus* and *Pteridium aquilinum* var. *pubescens*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid to high range 4,420-8615 ft., mean 5,878 ft.
Aspect: all aspects
Slope: flat to somewhat steep, range 0-26 degrees, mean 11.5 degrees
Topography: variable, but more often undulating or concave, bottom to top slopes
Litter Cover: range 10-94%, mean 51.1%
Rock Cover: range 2-62%, mean 24.4%
Bare ground: range 1-60%, mean 20.8%
Parent Material: more often Mesozoic granite, less often sedimentary and alluvium

Soil Texture: more often moderately coarse to very fine sandy loam, less often medium loam or coarse loamy sand

The *Pinus jeffreyi* Alliance was sampled in the eastern portion of the study area in the middle to upper montane of the San Jacinto Foothills - Cahuilla Mountains (M262Bl) and San Jacinto Mountains (M262Bm) Subsections.

Samples used to describe alliance: (n=22) WRIV1011, WRIV1012, WRIV1013, WRIV1014, WRIV0016, WRIV0162, WRIV0753, WRIV0757, WRIV0762, WRIV0764, WRIV0765, WRIV0776, WRIV0785, WRIV0788, WRIV0789, WRIV0842, WRIV0846, WRIV0904, WRIV0916, WRIV0919, WRIV0921, WRIV0922

RANK: G3 S3, G5 S5

GLOBAL DISTRIBUTION
Alliance: montane North Coast, montane Central Coast (including San Benito County), low elevation, montane, and subalpine Klamath Ranges, montane and subalpine Cascade Ranges, montane and subalpine Sierra Nevada (including Yosemite), montane and subalpine Transverse Ranges, montane and subalpine Peninsular Ranges (including Western Riverside County: San Jacinto Mountains), Great Basin, Anza-Borrego Desert, Baja CA.

Pinus jeffreyi/*Artemisia tridentata*/*Penstemon centranthifolius* Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains and San Jacinto Foothills – Cahuilla Mountains Subsections), though full distribution is not known
Pinus jeffreyi/*Quercus palmeri* Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills – Cahuilla Mountains) though full distribution is not known
Pinus jeffreyi/*Quercus wislizeni* Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains) though full distribution is not known
Pinus jeffreyi-Quercus kelloggii Association: Anza-Borrego Desert, Peninsular Ranges (Western Riverside County: San Jacinto Mountains) though full distribution is not known
Pinus jeffreyi/*Artemisia tridentata*/*Penstemon centranthifolius* Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains) though full distribution is not known

REFERENCES
CDFG 1998, CNPS and CDFG 2005a, Hanes 1976, Jimerson 1993, NatureServe et al. 2003b, Sawyer and Keeler-Wolf 1995

***Pinus jeffreyi* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PIJE-t	*Pinus jeffreyi*	100	14.3	1	26
	ABCO-t	*Abies concolor*	27.3	3.8	0.2	28
	QUKE-t	*Quercus kelloggii*	27.3	1.9	1	19
	QUCH2-t	*Quercus chrysolepis*	22.7	0.9	1	8
Tree Understory	QUWI2-m	*Quercus wislizeni*	40.9	4.5	0.2	27
	PIJE-m	*Pinus jeffreyi*	22.7	0.2	0.2	2
Shrub	ARTR2	*Artemisia tridentata*	36.4	3.8	0.2	25
	ARPU5	*Arctostaphylos pungens*	36.4	1.7	0.2	25
	ERWR	*Eriogonum wrightii*	31.8	1.1	0.2	8
	LOSU2	*Lonicera subspicata*	27.3	0.5	0.2	3
	ERFA2	*Eriogonum fasciculatum*	27.3	0.3	0.2	2
	CELE2	*Ceanothus leucodermis*	22.7	0.9	0.2	12
	CEBE3	*Cercocarpus betuloides*	22.7	0.9	0.2	17
Herb	BRTE	*Bromus tectorum*	63.6	11.2	7	40
	GILIA	*Gilia*	31.8	0.8	0.2	10
	CLPA5	*Claytonia parviflora*	18.2	1.9	2	20
	CRIN8	*Cryptantha intermedia*	18.2	0.2	0.2	2
	PECE2	*Penstemon centranthifolius*	18.2	0	0.2	0.2

***Pinus quadrifolia* Alliance (Parry Pinyon)**

ASSOCIATIONS
Pinus quadrifolia/*Quercus cornelius-mulleri*

LOCAL VEGETATION DESCRIPTION
Stands of *Pinus quadrifolia* Woodland form an open tree layer (11-25%, mean 18%) at 5-10m tall, where *Pinus quadrifolia* dominates. The shrub layer is open to intermittent (30-45%, mean 37.5%) at 0-5m tall, and the herbaceous layer is open (1%, mean 1%) at 0-0.5m tall. Total vegetation cover is 50-53% (mean 51.5%).

In the ***Pinus quadrifolia*/*Quercus cornelius-mulleri* Association,** *Pinus quadrifolia* is the sole dominant species in the overstory tree layer, and *Quercus cornelius-mulleri* co-dominates in the understory shrub layer. Various chaparral shrubs may intermix in the shrub layer as sub-dominants or co-dominants, including *Adenostoma fasciculatum*, *Cercocarpus betuloides*, and *Adenostoma sparsifolium*. Non-native grass *Bromus tectorum* is occasionally present in the herb understory.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4,721-4,744 ft., mean 4,733 ft.
Aspect: NW and SW
Slope: somewhat steep to steep, range 20-39 degrees, mean 29.5 degrees
Topography: undulating, lower slopes
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed granitic and metamorphic
Soil Texture: fine sand, medium to very fine sandy loam

The *Pinus quadrifolia* Alliance was sampled only in the San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsection in the middle montane, near the intersection of Highways 371 and 74.

Samples used to describe alliance: (n=2) WRIV0166, WRIV0175

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: montane Peninsular Ranges (including Western Riverside County: San Jacinto Foothills – Cahuilla Mountains Subsection), Anza-Borrego Desert, Baja California

Pinus quadrifolia/*Quercus cornelius-mulleri* Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills – Cahuilla Mountains Subsection), though full distribution is not known

REFERENCES
CDFG 1998, Sawyer and Keeler-Wolf 1995

***Pinus quadrifolia* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PIQU	*Pinus quadrifolia*	100	19	11	27
Shrub	QUCO7	*Quercus cornelius-mulleri*	100	14	10	18
	ADFA	*Adenostoma fasciculatum*	100	6.1	0.2	12
	CEBE3	*Cercocarpus betuloides*	100	4.5	4	5
	ADSP	*Adenostoma sparsifolium*	100	4.1	0.2	8
	ERFA2	*Eriogonum fasciculatum*	100	2.5	2	3
	CEGR	*Ceanothus greggii*	100	1.1	0.2	2
	YUSC2	*Yucca schidigera*	100	0.6	0.2	1
	NOLIN	*Nolina*	100	0.2	0.2	0.2
	OPUNT	*Opuntia*	50	2	4	4
	ERCO25	*Eriophyllum confertiflorum*	50	1	2	2
	ARGL4	*Arctostaphylos glauca*	50	0.5	1	1
	YUWH	*Yucca whipplei*	50	0.5	1	1
Herb	BRTE	*Bromus tectorum*	50	1	1	1

***Platanus racemosa* Alliance (California Sycamore)**

ASSOCIATIONS
Platanus racemosa/Annual Grass-Herb
Platanus racemosa-Salix laevigata/*Salix lasiolepis-Baccharis salicifolia*

LOCAL VEGETATION DESCRIPTION
Stands of *Platanus racemosa* Woodland and Forest form an open to intermittent tree layer (9-60%, mean 27.2%) at 5-35m tall, where *Platanus racemosa* dominates or co-dominates and may be regenerating in the understory. The shrub layer is open to continuous (5-75%, mean 24.1%) at 0.5-5m tall, and the herbaceous layer is open to intermittent (3-65%, mean 18%) at 0-2m tall, including a variety of native and non-native species (see species table). Total vegetation cover is 20-85% (mean 60.2%).

In the ***Platanus racemosa*/Annual Grass-Herb Association,** *Platanus racemosa* is the sole dominant tree. Other sub-dominant trees may include non-native species such as *Eucalyptus* spp., and *Schinus molle*. Shrubs that often occur in the understory include *Baccharis salicifolia, Toxicodendron diversilobum*, *Artemisia californica*, and *Eriogonum fasciculatum*. Understory herbs occur at low to moderate cover and often include non-native grasses *Bromus madritensis* and *Bromus diandrus* and native forb *Amsinckia menziesii*.

In the ***Platanus racemosa-Salix laevigata*/*Salix lasiolepis-Baccharis salicifolia* Association,** *Platanus racemosa* and *Salix laevigata* are characteristically present and usually co-dominant in the tree layer and may also be regenerating in the understory (though *S. laevigata* sometimes may be absent). *Quercus agrifolia*, *Fraxinus velutina*, and *Alnus rhombifolia* may occur in the tree layer usually at low cover. The understory shrub layer includes *Baccharis salicifolia* and *Salix lasiolepis*, which are characteristically present. *Toxicodendron diversilobum* and *Amorpha fruticosa* are occasionally present.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 700-3,166 ft., mean 1,549 ft.
Aspect: variable, but more often SW
Slope: flat to somewhat steep, range 0-15 degrees, mean 3.4 degrees
Topography: more often concave, less often flat, bottom to upper slopes
Litter Cover: range 2-100%, mean 41.1%
Rock Cover: range 0-93%, mean 37.4%
Bare ground: range 0-30%, mean 10.8%
Parent Material: alluvium from parent material that is more often Mesozoic granite, less often sedimentary, metavolcanic, gabbro and diorite
Soil Texture: varies from coarse sand to moderately fine silty clay loam

The *Platanus racemosa* Alliance was a riparian vegetation type commonly sampled in the Santa Ana Mountains (M262Bf), Fontana Plain - Calimesa Terraces (M262Bj, Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl), and San Jacinto Mountains (M262Bm) Subsections.

Samples used to describe alliance: (n=19) WRAA.037, WRAA.045, WRAA.047, WRAA.102, WRAA.128, WRAA.157, WRAA.158, WRIV0269, WRIV0400, WRIV0417, WRIV0436, WRIV0455, WRIV0482, WRIV0492, WRIV0557, WRIV0594, WRIV0739, WRIV0867, WRIV1030

RANK: G1 S1, G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: foothills of southern Sierra Nevada, Central Coast (including Santa Barbara and Santa Clara Counties), South Coast (including Western Riverside County), Transverse and Peninsular Ranges

(including Santa Monica, San Gabriel, San Bernardino, Santa Ana, and San Jacinto Mountains), Sacramento Valley, western Mojave and Colorado Deserts (including Anza-Borrego Desert), Baja California

Platanus racemosa/Annual Grass-Herb Association: Transverse and Peninsular Ranges (Santa Monica Mountains; Western Riverside County: Perris Valley and Hills Subsection), though full distribution is not known
Platanus racemosa-Salix laevigata/*Salix lasiolepis-Baccharis salicifolia* Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains and Perris Valley and Hills Subsections), though full distribution is not known

REFERENCES
Boyd et al. 1995, Campbell 1980, CDFG 1998, CNPS and CDFG 2005b, Evens and San 2004, Evens and San In publication, Hanes 1976, Holland 1986, Minnich 1976, Potter 2003, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Platanus racemosa* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PLRA-t	*Platanus racemosa*	100	20.2	1	58
	SALA3-t	*Salix laevigata*	42.1	3.5	0.2	14
	QUAG-t	*Quercus agrifolia*	36.8	1.3	1	8
	FRVE2	*Fraxinus velutina*	21.1	1.3	0.2	21
Shrub	BASA4	*Baccharis salicifolia*	73.7	4.5	1	14
	SALA6-m	*Salix lasiolepis*	63.2	5.3	1	23
	TODI	*Toxicodendron diversilobum*	63.2	4.1	1	25
	SAME5	*Sambucus mexicana*	31.6	0.5	0.2	4
	AMFR	*Amorpha fruticosa*	21.1	0.2	0.2	2
	ERFA2	*Eriogonum fasciculatum*	21.1	0.1	0.2	1
Herb	BRDI3	*Bromus diandrus*	42.1	3.6	1	20
	ARDO3	*Artemisia douglasiana*	31.6	0.5	0.2	3
	BRMA3	*Bromus madritensis*	26.3	2.5	2	23
	URDI	*Urtica dioica*	21.1	0.2	0.2	3
	HIIN3	*Hirschfeldia incana*	15.8	0.9	5	8
	AMME	*Amsinckia menziesii*	15.8	0.6	2	5
	TYDO	*Typha domingensis*	15.8	0.6	1	5
	AMPS	*Ambrosia psilostachya*	15.8	0.5	2	4
	PHRA2	*Phacelia ramosissima*	15.8	0.4	1	5
	MAMA8	*Marah macrocarpus*	15.8	0.2	0.2	2

***Platanus racemosa-Populus fremontii* Alliance (California Sycamore – Fremont Cottonwood)**

ASSOCIATIONS
Platanus racemosa-Populus fremontii/*Salix lasiolepis*
Platanus racemosa-Populus fremontii/*Salix lasiolepis-Salix exigua*/*Scirpus americanus*

LOCAL VEGETATION DESCRIPTION
Stands of *Platanus racemosa-Populus fremontii* Woodland form an open to intermittent tree layer (3-59%, mean 18.7%) at 5-15m tall, an open to intermittent shrub layer (10-50%, mean 26.7%) at 0.5-5m tall, and an open to intermittent herbaceous layer (10-30%, mean 19.6%) at 0-2m tall. Both *Platanus racemosa* and *Populus fremontii* may be co-dominant in the tree overstory, or one may be dominant and the other sub-dominant. Both species may be regenerating in the understory. Total vegetation cover is 33-78% (mean 54.9%).

In the ***Platanus racemosa-Populus fremontii*/*Salix lasiolepis* Association,** other species in the tree layer include characteristically present *Salix laevigata* and often present *Quercus agrifolia*. *Salix lasiolepis* is consistently present and usually dominant in the shrub layer, while *Baccharis salicifolia*, *Eriogonum fasciculatum*, *Toxicodendron diversilobum*, *Vitis girdiana* and *Sambucus mexicana* are occasionally to often present. The most common understory herbs include native species *Artemisia dracunculus* and non-native species *Bromus diandrus*, *Bromus madritensis*, and *Hirschfeldia incana*.

In the ***Platanus racemosa-Populus fremontii*/*Salix lasiolepis-Salix exigua*/*Scirpus americanus* Association,** *Platanus racemosa* and *Populus fremontii* create an open tree canopy. They occur over consistently present shrubs *Salix lasiolepis* and *Salix exigua* and occasionally regenerating trees *Salix laevigata* and *Salix gooddingii*. Other trees frequently intermix in the overstory and may include species such as *Quercus agrifolia*, *Salix laevigata*, *and Populus balsamifera*. *Baccharis salicifolia* is often present in the shrub understory. The most common understory herbs include natives *Scirpus americanus* and *Ambrosia psilostachya* and non-native *Cynodon dactylon*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 511-3,387 ft., mean 1,102 ft.
Aspect: variable, but more often flat
Slope: flat to gentle, range 0-3 degrees, mean 1 degree
Topography: concave or flat, bottom to lower slopes
Litter Cover: range 2-65%, mean 15.9%
Rock Cover: range 5-90%, mean 58.6%
Bare ground: range 3-58%, mean 18.3%
Parent Material: alluvium from parent materials that are more often Mesozoic granite, less often gabbro and diorite, sedimentary, metavolcanic, mixed granitic and metamorphic
Soil Texture: more often medium to fine sand, less often coarse loamy sand or medium silt loam

The *Platanus racemosa-Populus fremontii* Alliance was a riparian vegetation type commonly sampled in the Santa Ana Mountains (M262Bf), Fontana Plain - Calimesa Terraces (M262Bj, Perris Valley and Hills (M262Bk) and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections.

Samples used to describe alliance: (n=16) WRAA.068, WRAA.069, WRIV0464, WRIV0499, WRIV0656, WRIV0830, WRIV1008, WRIV1009, WRIV1028, WRIV1029, WRIV1031, WRIV1032, WRIV1033, WRIV1034, WRIV1038, WRIV1039

RANK: G2 S2, G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Central Coast, South Coast and Peninsular Ranges (including Western Riverside and San Diego Counties), Colorado Desert (Anza Borrego Desert and San Felipe Valley desert slopes), and potentially east to the western Mojave Desert, though full distribution is not known

Platanus racemosa-Populus fremontii/*Salix lasiolepis* Association: distribution same as alliance
Platanus racemosa-Populus fremontii/*Salix lasiolepis-Salix exigua*/*Scirpus americanus* Association: Peninsular Ranges (Western Riverside County: Santa Margarita Ecological Reserve in Santa Ana Mountains Subsection), though full distribution is not known

REFERENCES
Evens and San In publication, Holland 1986

***Platanus racemosa-Populus fremontii* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PLRA-t	*Platanus racemosa*	87.5	4.6	0.2	16
	POFR2-t	*Populus fremontii*	81.3	7	1	27
	QUAG-t	*Quercus agrifolia*	62.5	2.8	0.2	19
	SALA3-t	*Salix laevigata*	50	3.3	0.2	32
	POBA2	*Populus balsamifera*	25	0.2	0.2	1
Tree Understory	SALA3-m	*Salix laevigata*	31.3	1.4	1	8
	POFR2-m	*Populus fremontii*	25	0.4	1	2
Shrub	SALA6-m	*Salix lasiolepis*	100	12.4	1	28
	SAEX	*Salix exigua*	75	4.5	0.2	13
	BASA4	*Baccharis salicifolia*	68.8	2.2	0.2	10
	ERFA2	*Eriogonum fasciculatum*	25	0.8	0.2	9
	BRCA3	*Brickellia californica*	25	0.3	0.2	2
	AMFR	*Amorpha fruticosa*	25	0.3	0.2	2
	TODI	*Toxicodendron diversilobum*	25	0.2	0.2	1
Herb	SCAM2	*Scirpus americanus*	50	7	9	26
	CYDA	*Cynodon dactylon*	50	0.7	0.2	3
	AMPS	*Ambrosia psilostachya*	43.8	0.8	0.2	4
	MEAL2	*Melilotus albus*	37.5	0.6	1	3
	BRDI3	*Bromus diandrus*	31.3	2.1	1	15
	TYLA	*Typha latifolia*	31.3	1.8	1	13
	XAST	*Xanthium strumarium*	31.3	0.3	0.2	1
	BRMA3	*Bromus madritensis*	25	0.8	1	5
	HIIN3	*Hirschfeldia incana*	25	0.3	0.2	3
	JUNCU	*Juncus*	18.8	0.2	1	1
	ARDO3	*Artemisia douglasiana*	18.8	0.2	0.2	2

***Populus fremontii* Alliance (Fremont Cottonwood)**

ASSOCIATIONS
Populus fremontii/*Baccharis salicifolia*
Populus fremontii-Salix gooddingii/*Baccharis salicifolia*
Populus fremontii-Salix laevigata
Populus fremontii-Salix laevigata/*Salix lasiolepis*/*Vitis girdiana*
Populus fremontii-Salix laevigata/*Salix lasiolepis-Baccharis salicifolia*

LOCAL VEGETATION DESCRIPTION
Stands of *Populus fremontii* Woodland and Forest form an open to intermittent tree layer (2-65%, mean 30.7%) at 5-20m tall, where *Populus fremontii* usually dominates or co-dominates and may be regenerating in the shrub layer. *Salix laevigata* occurs in all five associations in the tree overstory/understory. The shrub layer is open to intermittent (1-65%, mean 25.4%) at 1-5m tall, and the herbaceous layer is open to continuous (0.2-80%, mean 30.6%) at 0-2m tall. Total vegetation cover is 12-95% (mean 70.2%).

In the ***Populus fremontii*/*Baccharis salicifolia* Association,** *Populus fremontii* dominates in the tree layer. *Baccharis salicifolia* and non-native *Tamarix* sp. are consistently present and are the most abundant species in the shrub understory.

In the ***Populus fremontii-Salix gooddingii*/*Baccharis salicifolia* Association,** *Populus fremontii* and *Salix gooddingii* are consistently present in the tree layer, where the two species may be co-dominant, or one may be sub-dominant to the other. *Baccharis salicifolia*, *Salix lasiolepis* and non-native *Tamarix* sp. are characteristically present in the shrub understory at low cover. *Ambrosia psilostachya* and *Bromus diandrus* are characteristically present herbs in the understory.

In the ***Populus fremontii-Salix laevigata* Association,** *Salix laevigata* is consistently present as a dominant or co-dominant tree and *Sambucus mexicana* is consistently present in the shrub layer at sparse cover. A variety of herb species occur across the stands.

In the ***Populus fremontii-Salix laevigata*/*Salix lasiolepis*/*Vitis girdiana* Association,** *Salix laevigata* is consistently present as a dominant, co-dominant, or sub-dominant tree. *Salix gooddingii*, and non-natives *Washingtonia* sp. and *Fraxinus uhdei* may be occasional to frequent in the tree layer. *Salix lasiolepis* and *Baccharis salicifolia* are consistently present in the shrub understory at low cover. The vine, *Vitis girdiana* occurs consistently in the understory, and *Artemisia douglasiana* and *Urtica dioica* are often present.

In the ***Populus fremontii-Salix laevigata*/*Salix lasiolepis-Baccharis salicifolia* Association**, *Salix laevigata* is characteristically present as a dominant, co-dominant, or sub-dominant tree. Other trees that are occasionally present at low cover include *Quercus agrifolia* and *Platanus racemosa*. The shrub understory includes characteristically present *Baccharis salicifolia* and *Salix lasiolepis*. *Artemisia douglasiana* and *Bromus madritensis* are often present in the understory.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 279-4,182 ft., mean 1,870 ft.
Aspect: variable, but more often flat
Slope: gentle to steep, range 0-3 degrees, mean 1 degrees
Topography: variable, but more often flat or concave, bottom to lower slopes
Litter Cover: range 0-90%, mean 58.4%
Rock Cover: range 0-72%, mean 13.7%
Bare ground: range 1-90%, mean 20.1%
Parent Material: alluvium from parent materials that are more often sedimentary, less often Mesozoic granite or mixed granitic and metamorphic
Soil Texture: more often medium sand, but varies from fine sand to moderately fine silty clay loam

The *Populus fremontii* Alliance was a riparian vegetation type commonly sampled in the Santa Ana Mountains (M262Bf), Fontana Plain - Calimesa Terraces (M262Bj, Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl), San Jacinto Mountains (M262Bm) Subsection

Samples used to describe alliance: (n=29) WRAA.002, WRAA.009, WRAA.019, WRAA.056, WRAA.087, WRAA.094, WRAA.147, WRAA.149, WRAA.162, WRIV0015, WRIV0093, WRIV0102, WRIV0103, WRIV0104, WRIV0120, WRIV0141, WRIV0147, WRIV0182, WRIV0432, WRIV0549, WRIV0651, WRIV0663, WRIV0668, WRIV0834, WRIV0935, WRIV0936, WRIV0937, WRIV0958, WRIV0960

RANK: G2 S2, G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: inner North Coast and northern Central Coast (including San Benito County), foothills of the Klamath and Cascade Ranges, Sierra Nevada foothills, Central Valley, South Coast, Peninsular and Transverse Ranges (including Western Riverside and San Diego Counties), Mojave and Colorado Deserts (including Anza-Borrego)

Populus fremontii/*Baccharis salicifolia* Association: inner South Coast and Peninsular Ranges in Western Riverside and San Diego Counties, though full distribution is not known but does include southwestern Utah and southwestern New Mexico
Populus fremontii-Salix gooddingii/*Baccharis salicifolia* Association: inner South Coast and Peninsular Ranges in Western Riverside and San Diego Counties, though full distribution is not known but does include southwestern New Mexico and southern Arizona
Populus fremontii-Salix laevigata Association: inner South Coast and Peninsular Ranges in Western Riverside and San Diego Counties, Colorado Desert (including San Felipe wash),though full distribution is not known
Populus fremontii-Salix laevigata/*Salix lasiolepis*/*Vitis girdiana* Association: inner South Coast in Western Riverside County, though full distribution is not known
Populus fremontii-Salix laevigata/*Salix lasiolepis-Baccharis salicifolia* Association: inner South Coast and Peninsular Ranges in Western Riverside, though full distribution is not known

REFERENCES
CDFG 1998, CNPS and CDFG 2005a, Evens and San In publication, NatureServe 2005, Potter 2003, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004, Vaghti 2003

***Populus fremontii* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	POFR2-t	*Populus fremontii*	100	16.7	1	42
	SALA3-t	*Salix laevigata*	65.5	9.8	1	45
	SAGO-t	*Salix gooddingii*	24.1	3.1	1	30
	QUAG-t	*Quercus agrifolia*	20.7	0.7	0.2	11
Tree Understory	SALA3-m	*Salix laevigata*	44.8	1.8	0.2	15
Shrub	BASA4	*Baccharis salicifolia*	89.7	6.9	1	35
	SALA6-m	*Salix lasiolepis*	65.5	6.3	0.2	55
	TAMAR2	*Tamarix*	55.2	3.1	0.2	23
	SAEX	*Salix exigua*	27.6	1.5	0.2	18
	SAME5	*Sambucus mexicana*	27.6	0.7	0.2	7
	AMFR	*Amorpha fruticosa*	20.7	0.4	0.2	5
	NIGL	*Nicotiana glauca*	20.7	0.2	0.2	3
	ERFA2	*Eriogonum fasciculatum*	20.7	0.1	0.2	1
Herb	ARDO3	*Artemisia douglasiana*	41.4	1.3	0.2	10
	BRDI3	*Bromus diandrus*	34.5	5.6	1	60
	AMPS	*Ambrosia psilostachya*	34.5	2.2	2	15
	BRMA3	*Bromus madritensis*	27.6	2.4	1	28
	HIIN3	*Hirschfeldia incana*	27.6	1.1	0.2	12
	BRTE	*Bromus tectorum*	24.1	1.4	3	10
	POMO5	*Polypogon monspeliensis*	20.7	1.9	0.2	40
	ARDR4	*Artemisia dracunculus*	17.2	0.3	0.2	6

***Pseudotsuga macrocarpa* Alliance (Bigcone Douglas-fir)**

ASSOCIATIONS
Pseudotsuga macrocarpa-Quercus chrysolepis

LOCAL VEGETATION DESCRIPTION
Stands of *Pseudotsuga macrocarpa* Woodland and Forest form an intermittent to continuous tree layer (35-68%, mean 54.8%) at 5-35m tall. The shrub layer is open to intermittent (2-50%, mean 25.5%) at 0.5-5m tall, and the herbaceous layer is open (0.2-15%, mean 5.7%) at 0-0.5m tall. *Pseudotsuga macrocarpa* co-dominates with *Quercus chrysolepis* and both species may be present in the shrub layer. Total vegetation cover is 45-82% (mean 68.3%).

In the ***Pseudotsuga macrocarpa-Quercus chrysolepis* Association,** *Pseudotsuga macrocarpa* and *Quercus chrysolepis* are consistently present in the tree overstory. The two species usually co-dominate in the tree layer, though *Quercus chrysolepis* is often present as an understory shrub. *Pinus coulteri* occasionally sub-dominates in the tree layer and *Pseudotsuga macrocarpa* is sometimes regenerating in the understory. *Quercus chrysolepis*, *Quercus wislizeni*, *Arctostaphylos glandulosa*, and *Heteromeles arbutifolia* are often present in the shrub layer. The most common understory herb species include natives *Galium angustifolium* and *Pentagramma triangularis* and non-native *Bromus diandrus*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 3,009-4,126 ft., mean 3,763 ft.
Aspect: NE
Slope: steep to very steep, range 38-50 degrees, mean 41.8 degrees
Topography: concave, mid to upper slopes
Litter Cover: range 35-80%, mean 53.3%
Rock Cover: range 5-40%, mean 27.3%
Bare ground: range 2-15%, mean 7.3%
Parent Material: Mesozoic granite
Soil Texture: coarse loamy sand, medium loam, medium to very fine sandy loam

The *Pseudotsuga macrocarpa* Alliance was sampled only in the Santa Ana Mountains (M262Bf) Subsection in the middle montane on north-trending, steep slopes.

Samples used to describe alliance: (n=4) WRIV0328, WRIV0340, WRIV0341, WRIV0344

RANK: G2 S2

GLOBAL DISTRIBUTION
Alliance: montane Central Coast (Sierra Madre, upper Sisquoc River drainage), montane Transverse and Peninsular Ranges (San Gabriel, Santa Ana, San Jacinto, and San Bernardino Mountains)

Pseudotsuga macrocarpa-Quercus chrysolepis Association: Transverse and Peninsular Ranges (Santa Ana and San Bernardino Mountains), though full distribution is not known

REFERENCES
Cheng 2004, Evens and San In publication, Hanes 1976, Keeler-Wolf 1990, Minnich 1976, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Pseudotsuga macrocarpa* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PSMA-t	*Pseudotsuga macrocarpa*	100	28.3	20	35
	QUCH2-t	*Quercus chrysolepis*	100	25.8	7	46
	PICO3-t	*Pinus coulteri*	50	1	1	3
Tree Understory	QUCH2-m	*Quercus chrysolepis*	75	13.3	0.2	45
	QUWI2-m	*Quercus wislizeni*	50	4.5	8	10
	PSMA-m	*Pseudotsuga macrocarpa*	25	0.1	0.2	0.2
Shrub	ARGL3	*Arctostaphylos glandulosa*	75	2.8	1	5
	HEAR5	*Heteromeles arbutifolia*	75	0.8	0.2	2
	ERFA2	*Eriogonum fasciculatum*	50	0.3	0.2	1
	KECO	*Keckiella cordifolia*	50	0.3	0.2	1
	DERI	*Dendromecon rigida*	50	0.1	0.2	0.2
	CELE2	*Ceanothus leucodermis*	25	0.5	2	2
	RHIL	*Rhamnus ilicifolia*	25	0.5	2	2
	ADFA	*Adenostoma fasciculatum*	25	0.3	1	1
	MALA6	*Malosma laurina*	25	0.3	1	1
	CEOL	*Ceanothus oliganthus*	25	0.1	0.2	0.2
	QUBE5	*Quercus berberidifolia*	25	0.1	0.2	0.2
Herb	BRDI3	*Bromus diandrus*	25	1.3	5	5
	GAAN2	*Galium angustifolium*	25	0.1	0.2	0.2
	PETR7	*Pentagramma triangularis*	25	0.1	0.2	0.2

***Quercus agrifolia* Alliance (Coast Live Oak)**

ASSOCIATIONS
Quercus agrifolia/Annual Grass-Herb
Quercus agrifolia/Chaparral
Quercus agrifolia/*Toxicodendron diversilobum* Riparian
Quercus agrifolia/*Toxicodendron diversilobum*/Grass
Quercus agrifolia-Platanus racemosa/*Toxicodendron diversilobum*
Quercus agrifolia-Platanus racemosa-Salix laevigata

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus agrifolia* Woodland and Forest form an open to continuous tree layer (10-81%, mean 52.5%) at 5-35m tall, an open to intermittent shrub layer (1-65%, mean 22.3%) at 0-5m tall, and an open to intermittent herbaceous layer (0.2-56%, mean 17.6%) at 0-1m tall. *Quercus agrifolia* dominates in the tree layer and is occasionally regenerating in the shrub layer. A variety of native and non-native species occupy the herb understory (see species table). Total vegetation cover is 33-94% (mean 73.2%).

In the ***Quercus agrifolia*/Annual Grass-Herb Association,** *Platanus racemosa* and *Populus fremontii* may occur at trace cover in the tree overstory or understory. *Rhus ovata* and *Eriogonum fasciculatum* are the most common species in the open shrub understory. A variety of grasses and forbs occupy the open to intermittent herb layer, the most common being native grasses *Melica imperfecta* and *Leymus condensatus* and non-native grasses *Bromus madritensis*, *Bromus hordeaceus*, and *Vulpia myuros*.

In the ***Quercus agrifolia*/Chaparral Association,** a variety of chaparral shrubs (e.g., *Heteromeles arbutifolia*, *Quercus berberidifolia*, *Ceanothus crassifolius*, *Rhamnus ilicifolia*, *Cercocarpus betuloides*, and *Adenostoma fasciculatum*) intermix in the understory.

In the ***Quercus agrifolia*/*Toxicodendron diversilobum* Riparian Association,** *Salix laevigata*, *Quercus engelmannii*, *Populus balsamifera*, and *Populus fremontii* are infrequently to often present at low cover. *Toxicodendron diversilobum* is characteristically present and usually dominant in the shrub understory, and *Rubus ursinus* and *Baccharis salicifolia* are sometimes present.

In the ***Quercus agrifolia*/*Toxicodendron diversilobum*/Grass Association,** *Quercus engelmannii* and non-native *Olea europaea* infrequently sub-dominate in the tree canopy. In the open shrub layer, *Toxicodendron diversilobum* is consistently present, while *Rhamnus ilicifolia*, *Heteromeles arbutifolia*, *Mimulus aurantiacus*, and *Lonicera subspicata* are occasionally present. A variety of herbs occur in the understory at similar or higher cover than shrubs in the shrub layer, including native species such as *Galium angustifolium*, *Marah macrocarpus*, *Melica imperfecta*, and *Nassella pulchra* and non-native species *Bromus diandrus* and *B. madritensis*.

In the ***Quercus agrifolia-Platanus racemosa*/*Toxicodendron diversilobum* Association,** *Platanus racemosa* is consistently present and is either co-dominant or sub-dominant with *Quercus agrifolia*. Other tree species (e.g., *Populus fremontii*, *Salix laevigata*, *Fraxinus velutina*, *Pseudotsuga macrocarpa*, *Umbellularia californica*, *Quercus engelmannii*) may occur as sub-dominants. *Toxicodendron diversilobum* is characteristically present in the shrub layer and may co-occur with a variety of species, including occasionally present *Rubus ursinus*, *Baccharis salicifolia*, and *Rhamnus ilicifolia*.

In the ***Quercus agrifolia-Platanus racemosa-Salix laevigata* Association,** both *Platanus racemosa* and *Salix laevigata* are consistently present as sub-dominant trees. *Quercus engelmannii* is infrequently present at trace cover. The most common understory shrubs include *Salix lasiolepis*, *Baccharis salicifolia*, and *Eriogonum fasciculatum*.

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 4 of 46 surveys of the *Quercus agrifolia* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 523-3,810 ft., mean 1,796 ft.
Aspect: all aspects
Slope: flat to steep, range 0-40 degrees, mean 8.1 degrees
Topography: variable, but more often concave or undulating, bottom to upper slopes
Litter Cover: range 8-90%, mean 66.2%
Rock Cover: range 0-80%, mean 18.2%
Bare ground: range 0.2-44%, mean 10.6%
Parent Material: more often Mesozoic granite and sedimentary and alluvium, less often gabbro and diorite, metavolcanic, metamorphic, mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, but varies from medium sand to moderately fine silty clay loam

The *Quercus agrifolia* Alliance was one of the most commonly sampled vegetation types, with sampling in the Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl), San Jacinto Mountains (M262Bm), Western Granitic Foothills (M262Bn) Subsections. It occurs on a variety of topographies and aspects.

Samples used to describe alliance: (n=46) WRAA.001, WRAA.016, WRAA.020, WRAA.040, WRAA.049, WRAA.052, WRAA.062, WRAA.070, WRAA.136, WRAA.137, WRAA.145, WRAA.148, WRAA.164, WRIV0018, WRIV0056, WRIV0109, WRIV0146, WRIV0148, WRIV0185, WRIV0266, WRIV0271, WRIV0285, WRIV0310, WRIV0318, WRIV0351, WRIV0366, WRIV0399, WRIV0452, WRIV0453, WRIV0506, WRIV0530, WRIV0542, WRIV0582, WRIV0584, WRIV0586, WRIV0593, WRIV0595, WRIV0597, WRIV0601, WRIV0605, WRIV0670, WRIV0832, WRIV0872, WRIV0986, WRIV1019, WRIV1036

RANK: G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: North to South Coast (Sonoma County to San Diego County, including Santa Clara and Western Riverside Counties and Point Reyes), Central Valley (including Suisun Marsh), montane Transverse and Peninsular Ranges (including Santa Monica, San Jacinto, Santa Ana, and San Bernardino Mountains), Anza-Borrego Desert, and Baja California

Quercus agrifolia/Annual Grass-Herb Association: Central Coast (Solano to Monterey County), South Coast (Ventura to San Diego County), and Peninsular Ranges (Santa Ana and San Jacinto Mountains)
Quercus agrifolia/Chaparral Association: Peninsular Ranges in Western Riverside, though full distribution is not known
Quercus agrifolia/*Toxicodendron diversilobum* Riparian Association: Peninsular Ranges in Western Riverside County, though full distribution is not known
Quercus agrifolia/*Toxicodendron diversilobum*/Grass Association: Central Coast (San Francisco Bay Area to Monterey County) to the South Coast (including Ventura, Los Angeles, Western Riverside and San Diego Counties)
Quercus agrifolia-Platanus racemosa/*Toxicodendron diversilobum* Association: South Coast and Peninsular Ranges (including Western Riverside and San Diego Counties), though full distribution is not known
Quercus agrifolia-Platanus racemosa-Salix laevigata Association: Peninsular Ranges in Western Riverside County, though full distribution is not known

REFERENCES
Allen et al. 1989, Allen et al. 1991, Boyd et al. 1995, CDFG 1998, CDFG 2000, CNPS 2005, CNPS and CDFG 2005b, Evens and San 2004, Evens and San In publication, Hanes 1976, Keeler-Wolf 1990, Minnich 1976, NatureServe et al. 2003a, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Quercus agrifolia* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	QUAG-t	*Quercus agrifolia*	97.8	43.9	5	79
	PLRA-t	*Platanus racemosa*	52.2	3.4	0.2	30
	SALA3-t	*Salix laevigata*	26.1	1.2	1	12
Tree Understory	QUAG-m	*Quercus agrifolia*	47.8	2.3	1	15
Shrub	TODI	*Toxicodendron diversilobum*	56.5	5.6	0.2	30
	ERFA2	*Eriogonum fasciculatum*	34.8	1.4	0.2	16
	HEAR5	*Heteromeles arbutifolia*	34.8	1.3	0.2	12
	RHIL	*Rhamnus ilicifolia*	26.1	1.1	0.2	12
	LOSU2	*Lonicera subspicata*	26.1	0.4	0.2	3
Herb	BRDI3	*Bromus diandrus*	37	3.2	0.2	25
	BRMA3	*Bromus madritensis*	26.1	1.1	0.2	20
	ARDO3	*Artemisia douglasiana*	23.9	0.5	0.2	4
	AMPS	*Ambrosia psilostachya*	23.9	0.5	0.2	10
	LECO12	*Leymus condensatus*	19.6	0.4	0.2	5
	MAMA8	*Marah macrocarpus*	17.4	0.5	0.2	5
	MEIM	*Melica imperfecta*	15.2	0.3	1	2

***Quercus chrysolepis* Alliance (Canyon Live Oak)**

ASSOCIATIONS
Quercus chrysolepis
Quercus chrysolepis-Pinus jeffreyi
Quercus chrysolepis-Pseudotsuga macrocarpa

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus chrysolepis* Woodland and Forest form an open to continuous tree layer (19-75%, mean 55.3%) at 5-35m tall, an open to continuous shrub layer (1-74%, mean 14.3%) at 0-5m tall, and an open to continuous herbaceous layer (0.2-85%, mean 15.5%) at 0-0.5m tall. *Quercus chrysolepis* usually dominates in the tree layer and is often regenerating in the shrub layer. A variety of native and non-native species occupy the herb understory (see species table). Total vegetation cover is 20-93% (mean 65.6%).

In the ***Quercus chrysolepis* Association,** *Quercus chrysolepis* is the sole dominant in the overstory tree/shrub layer. Trees that occur infrequently at trace cover include *Pinus coulteri*, *Quercus kelloggii*, *Pinus jeffreyi*, *Pinus quadrifolia*, *Calocedrus decurrens*, and *Pinus lambertiana*. *Quercus wislizeni* is often present at sparse cover in the tree/shrub layer.

In the ***Quercus chrysolepis-Pinus jeffreyi* Association,** conifer and hardwood species mix in the tree overstory and may be regenerating in the understory. *Pinus jeffreyi* and *Abies concolor* are characteristically present at low cover in the overstory, where *Pinus jeffreyi* is sub-dominant or co-dominate with *Quercus chrysolepis*. Other trees that are often present at sparse cover include *Pinus lambertiana*, *Calocedrus decurrens*, and *Pinus coulteri*. *Eriogonum fasciculatum* is the most common species in the sparse shrub layer.

In the ***Quercus chrysolepis-Pseudotsuga macrocarpa* Association,** *Pseudotsuga macrocarpa* is consistently present as a sub-dominant tree in the overstory. Other trees that may be present at sparse cover include *Pinus coulteri*, *Acer macrophyllum*, *Platanus racemosa*, *Alnus rhombifolia*, and *Salix laevigata*. The most common understory shrub and herb species are *Yucca whipplei*, and native grass, *Melica imperfecta*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3,825-6,838 ft., mean 5,294 ft.
Aspect: variable, but more often NE
Slope: gentle to very steep, range 3-52 degrees, mean 24.3 degrees
Topography: variable, but more often undulating or concave, bottom to upper slopes
Litter Cover: range 5-88%, mean 59.1%
Rock Cover: range 5-87%, mean 26.6%
Bare ground: range 0-26%, mean 9.9%
Parent Material: more often Mesozoic granite, less often sedimentary, metavolcanic, mixed granitic and metamorphic
Soil Texture: varies from coarse sand to medium loam

The *Quercus chrysolepis* Alliance was sampled in the Santa Ana Mountains (M262Bf), San Jacinto Foothills - Cahuilla Mountains (M262Bl), and San Jacinto Mountains (M262Bm) Subsections in the middle montane usually on north-trending or neutral slopes or in canyon riparian drainages of variable aspect.

Samples used to describe alliance: (n=18) WRAA.076, WRAA.078, WRAA.079, WRAA.082, WRIV0291, WRIV0336, WRIV0618, WRIV0703, WRIV0734, WRIV0735, WRIV0763, WRIV0766, WRIV0771, WRIV0774, WRIV0779, WRIV0781, WRIV0798, WRIV0858

RANK: G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: outer North Coast, montane North Coast and Central Coast (including San Benito County and Los Padres National Forest), Klamath Ranges, montane Cascade Range, montane Sierra Nevada, montane Transverse and Peninsular Ranges (including Santa Ana, San Jacinto, and San Bernardino Mountains), Anza-Borrego and Mojave Deserts, Baja California

Quercus chrysolepis Association: Transverse and Peninsular Ranges (including San Bernardino Mountains, and Western Riverside and San Diego Counties), and potentially across the range of the alliance
Quercus chrysolepis-Pinus jeffreyi Association: Peninsular Ranges (Western Riverside: San Jacinto Mountains), though full distribution is not known
Quercus chrysolepis-Pseudotsuga macrocarpa Association: Peninsular Ranges (Western Riverside County and San Bernardino Mountains) though full distribution is not known

REFERENCES
Borchert et al. 2004, CDFG 1998, CNPS and CDFG 2005a, Evens and San In publication, Gordon and White 1994, Holland 1986, Keeler-Wolf 1990, Meier 1979, Minnich 1976, Potter 2003, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004, Vogl 1976

***Quercus chrysolepis* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	QUCH2-t	*Quercus chrysolepis*	88.9	40.6	4	74
	PICO3-t	*Pinus coulteri*	50	1.1	0.2	4
	PIJE-t	*Pinus jeffreyi*	33.3	1.8	0.2	14
	PSMA-t	*Pseudotsuga macrocarpa*	22.2	1.1	2	10
Tree Understory	QUCH2-m	*Quercus chrysolepis*	72.2	7.9	0.2	74
	QUWI2-m	*Quercus wislizeni*	44.4	1.8	0.2	8
Shrub	LOSU2	*Lonicera subspicata*	22.2	0.1	0.2	1
Herb	BRTE	*Bromus tectorum*	38.9	3	0.2	18
	CRIN8	*Cryptantha intermedia*	27.8	0.7	0.2	7
	GAAP2	*Galium aparine*	22.2	0.8	0.2	10
	GAAN2	*Galium angustifolium*	22.2	0.1	0.2	1
	CLPA5	*Claytonia parviflora*	16.7	4.3	2	60
	BRDI3	*Bromus diandrus*	16.7	1.3	2	15
	LEFI11	*Lessingia filaginifolia*	16.7	0.1	0.2	1

***Quercus engelmannii* Alliance (Engelmann Oak)**

ASSOCIATIONS
Quercus engelmannii/*Quercus berberidifolia*
Quercus engelmannii/*Toxicodendron diversilobum*/Grass
Quercus engelmannii-Quercus agrifolia/*Artemisia californica*
Quercus engelmannii-Quercus agrifolia/*Toxicodendron diversilobum*/Annual Grass

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus engelmannii* Woodland form an open to intermittent tree layer (9-54%, mean 27.5%) at 5-15m tall, an open to continuous shrub layer (1-69%, mean 23.7%) at 0.5-5m tall, and an open to continuous herbaceous layer (6-80%, mean 47.4%) at 0-1m tall. *Quercus engelmannii* dominates in the tree layer or may co-dominate or sub-dominate with *Quercus agrifolia*, and both species are sometimes regenerating in the shrub layer. *Platanus racemosa* and *Salix laevigata* occur infrequently as sub-dominant trees. Total vegetation cover is 43-95% (mean 75.6%).

In the ***Quercus engelmannii*/*Quercus berberidifolia* Association,** the chaparral species *Quercus berberidifolia* consistently occurs as a dominant or co-dominant shrub in an open to intermittent shrub understory. Other characteristically present shrubs include *Adenostoma fasciculatum*, *Eriogonum fasciculatum*, *Rhamnus ilicifolia*, and *Ceanothus crassifolius*.

In the ***Quercus engelmannii*/*Toxicodendron diversilobum*/Grass Association,** *Quercus engelmannii* dominates in the tree overstory, while *Quercus agrifolia* is often present at low cover. The open shrub understory includes consistently present *Toxicodendron diversilobum* and occasionally present *Rhamnus ilicifolia* and *Opuntia phaeacantha*. Diverse annual and perennial grasses and forbs intermix in the intermittent to continuous herb understory. The most common herbs include natives *Nassella pulchra*, *Clarkia purpurea* subsp. *quadrivulnera* and *Leymus condensatus* and non-native species *Bromus diandrus*, *Erodium* spp., *Avena* spp., *Centaurea melitensis*, *Lactuca serriola*, and *Hirschfeldia incana*.

In the ***Quercus engelmannii-Quercus agrifolia*/*Artemisia californica* Association,** both tree species are consistently present and generally co-dominant in an open to intermittent tree overstory. The shrub understory includes characteristically present *Artemisia californica* and *Malosma laurina*, and often present *Eriogonum fasciculatum*, *Rhamnus ilicifolia*, and *Lotus scoparius*.

In the ***Quercus engelmannii-Quercus agrifolia*/*Toxicodendron diversilobum*/Annual Grass Association,** both tree species are consistently present and generally co-dominant in an open to intermittent tree overstory. The open shrub understory consists of characteristically present *Toxicodendron diversilobum*, and occasionally present *Sambucus mexicana Adenostoma fasciculatum*, *Salix lasiolepis*, and *Eriogonum fasciculatum*. Understory herbs include a variety of non-native and native species, including *Bromus diandrus*, *Avena fatua*, *Erodium* sp., *Nassella pulchra*, and *Vulpia myuros*,

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in all 15 surveys of the *Quercus engelmannii* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,193-2,110 ft., mean 1,794 ft.
Aspect: all aspects
Slope: gentle to steep, range 1-29 degrees, mean 10.3 degrees
Topography: more often undulating or convex, less often flat, bottom to top slopes
Litter Cover: range 15-82%, mean 47.2%
Rock Cover: range 3-30%, mean 18.7%
Bare ground: range 1-45%, mean 19.7%
Parent Material: Mesozoic granite, sedimentary, volcanic
Soil Texture: varies from moderately coarse sandy loam to fine clay

The *Quercus engelmannii* Alliance was sampled only in the Santa Ana Mountains (M262Bf) Subsection, in or near the Santa Rosa Plateau, Tenaja Canyon, and Temecula Canyon.

Samples used to describe alliance: (n=15) WRAA.036, WRAA.038, WRAA.061, WRAA.166, WRIV0231, WRIV0233, WRIV0263, WRIV0264, WRIV0309, WRIV0312, WRIV0346, WRIV0355, WRIV0361, WRIV0362, WRIV0990

RANK: G2 S2, G3 S3

GLOBAL DISTRIBUTION
Alliance: western Peninsular Ranges (including Western Riverside County: Santa Rosa Plateau and Santa Ana Mountains; San Diego County: Santa Margarita and Palomar Mountains and hills north and east of Ramona), South Coast (Los Angeles to Riverside Counties), Channel Islands and Baja California

Quercus engelmannii/*Quercus berberidifolia* Association: Peninsular Ranges (including Western Riverside and San Diego Counties)
Quercus engelmannii-Quercus agrifolia/*Artemisia californica* Association: Peninsular Ranges (including Western Riverside and San Diego Counties)
Quercus engelmannii/*Toxicodendron diversilobum*/Grass Association: Peninsular Ranges (including Western Riverside and San Diego Counties)
Quercus engelmannii-Quercus agrifolia/*Toxicodendron diversilobum*/Annual Grass-Herb Association: Peninsular Ranges (including Western Riverside and San Diego Counties)

REFERENCES
Beauchamp 1986, Boyd et al. 1995, CNPS 2005, Evens and San In publication, Reiser 2001, Sawyer and Keeler-Wolf 1995

***Quercus engelmannii* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	QUEN-t	*Quercus engelmannii*	100	20.2	4	40
	QUAG-t	*Quercus agrifolia*	80	7.3	2	28
Tree Understory	QUEN-m	*Quercus engelmannii*	33.3	0.6	0.2	3
	QUAG-m	*Quercus agrifolia*	20	0.7	2	5
Shrub	TODI	*Toxicodendron diversilobum*	66.7	3.4	0.2	20
	RHIL	*Rhamnus ilicifolia*	53.3	1.2	0.2	6
	MALA6	*Malosma laurina*	40	2	0.2	10
	ERFA2	*Eriogonum fasciculatum*	40	1.5	0.2	9
	ARCA11	*Artemisia californica*	33.3	6.3	10	32
	ADFA	*Adenostoma fasciculatum*	33.3	4.3	0.2	31
	QUBE5	*Quercus berberidifolia*	26.7	1.6	1	16
	OPPH	*Opuntia phaeacantha*	20	0.7	0.2	6
	LOSC2	*Lotus scoparius*	20	0.1	0.2	1
Herb	BRDI3	*Bromus diandrus*	46.7	11.8	6	60
	ERODI	*Erodium*	40	6.4	1	45
	NAPU4	*Nassella pulchra*	40	6.1	1	37
	AVBA	*Avena barbata*	26.7	4.4	4	30
	CEME2	*Centaurea melitensis*	26.7	0.4	0.2	4
	AVFA	*Avena fatua*	20	2.7	3	25
	HIIN3	*Hirschfeldia incana*	20	0.5	0.2	7
	CLPUQ	*Clarkia purpurea* subsp. *quadrivulnera*	20	0.1	0.2	1
	LASE	*Lactuca serriola*	20	0.1	0.2	1

***Quercus kelloggii* Alliance (Black Oak)**

ASSOCIATIONS
Quercus kelloggii-Pinus coulteri/Arctostaphylos glandulosa
Quercus kelloggii-Pinus coulteri/Arctostaphylos pringlei

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus kelloggii* Woodland form an open to intermittent tree layer (14-40%, mean 23.8%) at 5-20m tall, where *Quercus kelloggii* dominates or co-dominates with *Pinus coulteri*. The shrub layer is open to intermittent (3-50%, mean 21.9%) at 0-5m tall, and the herbaceous layer is open to intermittent (10-50%, mean 23%) at 0-0.5m tall. Total vegetation cover is 35-75% (mean 53.8%).

In the ***Quercus kelloggii-Pinus coulteri/Arctostaphylos glandulosa*/Annual Grass-Herb Association,** *Pinus coulteri* is usually sub-dominant. *Arctostaphylos glandulosa* is consistently present at sparse cover in the shrub understory, where *Quercus wislizeni* is a common species. The herb understory is intermittent to dense, including the native herb *Nemophila menziesii*, and non-native herbs *Bromus diandrus* and *B. tectorum*.

In the ***Quercus kelloggii-Pinus coulteri/Arctostaphylos pringlei* Association,** *Pinus coulteri* is either sub-dominant or co-dominant with *Quercus kelloggii*. *Arctostaphylos pringlei* is present in the shrub layer at low cover. The most common shrubs that intermix in the understory include *Ceanothus integerrimus*, *Ceanothus leucodermis*, and *Eriogonum fasciculatum*. The herb understory is open and includes variety of native and non-native annuals (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4,900-6,523 ft., mean 5,439 ft.
Aspect: variable, but often SW
Slope: gentle to steep, range 5-27 degrees, mean 17.9 degrees
Topography: variable, but more often undulating, mid to top slopes
Litter Cover: range 20-90%, mean 62.5%
Rock Cover: range 3-36%, mean 11.6%
Bare ground: range 3-50%, mean 21.4%
Parent Material: Mesozoic granite, mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, infrequently moderately coarse sandy loam

The *Quercus kelloggii* Alliance was sampled only in the San Jacinto Mountains (M262Bm) Subsection across the middle montane.

Samples used to describe alliance: (n=8) WRIV0702, WRIV0713, WRIV0723, WRIV0865, WRIV0901, WRIV0902, WRIV0909, WRIV0911

RANK: G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: North and Central Coast, Klamath Ranges, Cascade Range, Sierra Nevada, montane Transverse and Peninsular Ranges (including San Jacinto and San Bernardino Mountains), Anza-Borrego Desert

Quercus kelloggii-Pinus coulteri/Arctostaphylos glandulosa Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains), though full distribution is not known
Quercus kelloggii-Pinus coulteri/Arctostaphylos pringlei Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains), though full distribution is not known

REFERENCES
Allen et al. 1989, Allen et al. 1991, CDFG 1998, Evens and San In publication, Keeler-Wolf 1990, Minnich 1976, NatureServe et al. 2003b, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Quercus kelloggii* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	QUKE-t	*Quercus kelloggii*	100	16.1	7	32
	PICO3-t	*Pinus coulteri*	100	7.5	1	20
Tree Understory	QUWI2-m	*Quercus wislizeni*	50	1.4	0.2	5
	QUCH2-m	*Quercus chrysolepis*	25	1.5	2	10
Shrub	ARPR	*Arctostaphylos pringlei*	50	4.4	7	11
	CEIN3	*Ceanothus integerrimus*	37.5	3.4	5	15
	CELE2	*Ceanothus leucodermis*	37.5	2	3	9
	ARGL3	*Arctostaphylos glandulosa*	37.5	0.8	1	3
	ERFA2	*Eriogonum fasciculatum*	37.5	0.6	1	3
Herb	BRTE	*Bromus tectorum*	75	3.8	0.2	10
	CLPA5	*Claytonia parviflora*	50	1.6	1	5
	BRDI3	*Bromus diandrus*	37.5	7	1	35
	NEME	*Nemophila menziesii*	37.5	2.3	0.2	14
	CLPE	*Claytonia perfoliata*	37.5	1.1	1	5
	BRMA3	*Bromus madritensis*	25	0.6	0.2	5
	CRIN8	*Cryptantha intermedia*	25	0.5	1	3
	LOST4	*Lotus strigosus*	25	0.5	1	3
	CLRH	*Clarkia rhomboidea*	25	0.3	0.2	2
	GILIA	*Gilia*	25	0.2	0.2	1

***Salix gooddingii* Alliance (Black Willow)**

ASSOCIATIONS
Salix gooddingii
Salix gooddingii/Baccharis salicifolia
Salix gooddingii/Lepidium latifolia
Salix gooddingii-Salix lucida-Populus fremontii

LOCAL VEGETATION DESCRIPTION
Stands of *Salix gooddingii* Woodland and Forest form an open to intermittent tree layer (10-60%, mean 33.8%) at 5-20m tall, an open to continuous shrub layer (7-70%, mean 26.3%) at 1-10m tall, and an open to continuous herbaceous layer (1-85%, mean 31.4%) at 0-5m tall. *Salix gooddingii* typically dominates in the tree layer and is often regenerating in the shrub layer. *Salix laevigata*, *Salix lucida*, *Platanus racemosa* and *Populus fremontii* may be regenerating in the tree understory. Total vegetation cover is 34-98% (mean 77.3%).

In the ***Salix gooddingii* Association,** *Salix gooddingii* is the sole dominant tree and is frequently regenerating in the understory. Non-native species in the genus *Eucalyptus* occasionally intermix as trees. *Baccharis salicifolia* and non-natives *Ricinus communis* and *Tamarix* occur occasionally as shrubs.

In the ***Salix gooddingii/Baccharis salicifolia* Association,** *Salix gooddingii* creates an open to intermittent tree canopy. *Salix laevigata* is often present in the tree layer at low to moderate cover, while *Eucalyptus* and *Platanus racemosa* are occasionally present at trace cover. The shrub layer is open to intermittent with *Baccharis salicifolia* consistently present and usually dominant. Other shrub species may include *Salix lasiolepis*, *Baccharis emoryi*, and non-native *Tamarix* spp. and *Nicotiana glauca*.

In the ***Salix gooddingii/Lepidium latifolium* Association,** *Salix gooddingii* creates an open to intermittent tree canopy over non-native herb *Lepidium latifolium*. Other species that occur frequently in the understory include shrubs *Baccharis salicifolia* and *Baccharis emoryi*, native herb *Urtica dioica*, and non-native herbs *Arundo donax*, *Conium maculatum*, and *Raphanus sativus*.

In the ***Salix gooddingii-Salix lucida-Populus fremontii* Association,** all three tree species are characteristically present in the tree overstory and or tree understory. *Salix gooddingii* is usually co-dominant with either or both of the other two tree species. Other trees that intermix as sub-dominants may include *Salix laevigata* and non-natives *Eucalyptus* spp. and *Fraxinus velutina*. The most common understory shrubs are *Baccharis salicifolia*, *Salix lasiolepis*, and non-native *Tamarix* spp. Non-native grass *Arundo donax* is consistently present in the herb understory, while natives *Vitis girdiana*, *Urtica dioica*, *Typha latifolia*, and *Scirpus americanus* are often present.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 421-1,652 ft., mean 938 ft.
Aspect: variable, but more often flat
Slope: flat to gentle, range 0-3 degrees, mean 0.7 degrees
Topography: more often flat or concave, less often undulating, bottom to lower slopes
Litter Cover: range 15-95%, mean 61%
Rock Cover: range 0-71%, mean 7.1%
Bare ground: range 0-79%, mean 23.4%
Parent Material: alluvium from a variety of parent materials (sedimentary, Mesozoic granite, gabbro and diorite, mixed granitic and metamorphic)
Soil Texture: varies from medium sand to muck

The *Salix gooddingii* Alliance was sampled in seasonally flooded riparian corridors of low elevations in the Santa Ana Mountains (M262Bf), Fontana Plain - Calimesa Terraces (M262Bj), and Perris Valley and Hills (M262Bk) Subsections including the Santa Ana River drainage.

Samples used to describe alliance: (n=20) WRAA.003, WRAA.029, WRAA.064, WRAA.065, WRAA.066, WRAA.112, WRAA.115, WRAA.120, WRIV0408, WRIV0632, WRIV0633, WRIV0635, WRIV0641, WRIV0647, WRIV0648, WRIV0736, WRIV0738, WRIV0740, WRIV0741, WRIV0953

RANK: G2 S1, G2 S2, G3 S2, G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: inner North Coast, Central to South Coast (including Point Reyes and Western Riverside County), Central Valley, Peninsular Ranges (including Western Riverside County), Cascade Range foothills, Sierra Nevada foothills, Mojave Desert, Colorado Desert

Salix gooddingii Association: South Coast of Western Riverside County, though full distribution is not known
Salix gooddingii/*Baccharis salicifolia* Association: South Coast and Peninsular Ranges (San Diego and Western Riverside Counties), though full distribution is not known
Salix gooddingii/*Lepidium latifolium* Association: South Coast and Peninsular Ranges (San Diego and Western Riverside Counties), though full distribution is not known
Salix gooddingii-Salix lucida-Populus fremontii Association: South Coast and Peninsular Ranges of Western Riverside, though full distribution is not known

REFERENCES
Evens and San In publication, NatureServe et al. 2003a, Sawyer and Keeler-Wolf 1995

***Salix gooddingii* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	SAGO-t	*Salix gooddingii*	95	23.9	4	60
	POFR2-t	*Populus fremontii*	30	3	0.2	25
	EUCAL	*Eucalyptus*	30	0.8	0.2	8
	SALA3-t	*Salix laevigata*	25	2.8	2	38
	SALU-t	*Salix lucida*	20	0.9	2	6
Tree Understory	SAGO-m	*Salix gooddingii*	55	6.1	5	30
	SALU-m	*Salix lucida*	30	1.6	0.2	12
Shrub	BASA4	*Baccharis salicifolia*	75	6	0.2	20
	VIGI2	*Vitis girdiana*	40	3.4	0.2	50
	SALA6-m	*Salix lasiolepis*	40	2.2	0.2	11
	TAMAR2	*Tamarix*	40	1.6	0.2	9
	BAEM	*Baccharis emoryi*	25	0.9	1	7
Herb	URDI	*Urtica dioica*	60	1.7	0.2	12
	ARDO4	*Arundo donax*	50	7.8	1	40
	HIIN3	*Hirschfeldia incana*	30	2	0.2	30
	LELA2	*Lepidium latifolium*	25	6.3	2	70
	BRDI3	*Bromus diandrus*	20	2.6	6	16
	TYLA	*Typha latifolia*	20	0.9	3	6
	RASA2	*Raphanus sativus*	20	0.1	0.2	1
	COMA2	*Conium maculatum*	15	3.7	1	70
	BRMA3	*Bromus madritensis*	15	0.6	1	7
	HELIA3	*Helianthus*	15	0.2	0.2	2
	SCAM2	*Scirpus americanus*	15	0.2	0.2	3
	ARDR4	*Artemisia dracunculus*	15	0.2	1	1

***Salix laevigata* Alliance (Red Willow)**

ASSOCIATIONS
Salix laevigata/*Salix lasiolepis*/*Artemisia douglasiana*

LOCAL VEGETATION DESCRIPTION
Stands of *Salix laevigata* Woodland form an open to intermittent tree layer (4-55%, mean 26.3%) at 5-20m tall, an open to intermittent shrub layer (7-60%, mean 31.3%) at 0.5-10m tall, and an open to continuous herbaceous layer (5-80%, mean 32.3%) at 0-1m tall. *Salix laevigata* dominates in the tree layer and is infrequently regenerating in the shrub layer. Total vegetation cover is 32-92% (mean 68.6%).

In the ***Salix laevigata*/*Salix lasiolepis*/*Artemisia douglasiana* Association,** *Salix laevigata* is the sole dominant species in the tree overstory. Other trees that infrequently sub-dominate include *Platanus racemosa*, *Acer negundo* var. *californicum*, *Salix gooddingii*, *Pinus jeffreyi*, *Populus fremontii*, and *Quercus agrifolia*. All tree species in this association may be found regenerating in the understory. Because this association occurs across different ecological locales, a diversity of riparian, disturbance, chaparral, dessert, and coastal sage shrubs may occupy the understory. *Salix lasiolepis* is characteristically present and usually dominant in the shrub layer. Other common understory shrubs include *Baccharis salicifolia*, and *Artemisia tridentata*. A wide variety of herb species occupy the understory, the most common being natives *Artemisia douglasiana* and *Ambrosia psilostachya* and non-native *Hirschfeldia incana*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 981-5,027 ft., mean 2,711 ft.
Aspect: all aspects
Slope: gentle to moderate, range 1-9 degrees, mean 2.6 degrees
Topography: more often concave, less often convex, bottom to mid slopes
Litter Cover: range 23-90%, mean 58.2%
Rock Cover: range 0.2-40%, mean 18.2%
Bare ground: range 0-35%, mean 13.8%
Parent Material: alluvium from parent material that is more often Mesozoic granite or sedimentary, less often gabbro and diorite, or mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, but varies from coarse loamy sand to moderately fine silty clay loam

The *Salix laevigata* Alliance was sampled in seasonally flooded riparian corridors of low to middle elevations in the Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl), and San Jacinto Mountains (M262Bm) Subsections including the Santa Margarita River watershed.

Samples used to describe alliance: (n=15) WRIV0046, WRIV0061, WRIV0128, WRIV0183, WRIV0209, WRIV0262, WRIV0460, WRIV0532, WRIV0625, WRIV0631, WRIV0727, WRIV0928, WRIV0930, WRIV0932, WRIV0957

RANK: G2 S2, G3 S2, G3 S3(depending on association)

GLOBAL DISTRIBUTION
Alliance: Cismontane California, Transmontane California, Intermountain-West

Salix laevigata/*Salix lasiolepis*/*Artemisia douglasiana* Association: South Coast and Peninsular Ranges (including Ventura, Western Riverside, and San Diego Counties)

REFERENCES
Evens and San In publication, NatureServe et al. 2003a, NatureServe et al. 2003b, Potter 2003, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Salix laevigata* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	SALA3-t	*Salix laevigata*	93.3	19.4	4	50
	SAGO-t	*Salix gooddingii*	20	0.9	2	9
Tree Understory	QUAG-m	*Quercus agrifolia*	20	0.1	0.2	1
Shrub	SALA6-m	*Salix lasiolepis*	73.3	11.9	4	35
	ERFA2	*Eriogonum fasciculatum*	46.7	0.6	0.2	2
	BASA4	*Baccharis salicifolia*	40	4.2	0.2	25
	ARTR2	*Artemisia tridentata*	33.3	1.6	1	18
	SALA6-t	*Salix lasiolepis*	26.7	6.4	14	52
	SAME5	*Sambucus mexicana*	26.7	2.5	0.2	28
	ROCA2	*Rosa californica*	20	1.1	4	8
Herb	ARDO3	*Artemisia douglasiana*	40	4.3	1	40
	BRMA3	*Bromus madritensis*	40	1.7	1	12
	HIIN3	*Hirschfeldia incana*	40	1	1	7
	AMPS	*Ambrosia psilostachya*	33.3	1.8	0.2	18
	BRDI3	*Bromus diandrus*	33.3	0.9	1	4
	ERCI6	*Erodium cicutarium*	26.7	2.2	0.2	25
	URDI	*Urtica dioica*	26.7	0.7	0.2	7
	ERODI	*Erodium*	20	2.9	0.2	35
	BRTE	*Bromus tectorum*	20	1.7	2	17
	AMME	*Amsinckia menziesii*	20	0.3	0.2	2

Adenostoma fasciculatum Alliance (Chamise)

ASSOCIATIONS
Adenostoma fasciculatum Pure
Adenostoma fasciculatum-Arctostaphylos pringlei
Adenostoma fasciculatum-Eriogonum fasciculatum
Adenostoma fasciculatum-Eriogonum fasciculatum-Salvia apiana
Adenostoma fasciculatum-Malosma laurina
Adenostoma fasciculatum Disturbance

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum* Shrubland form an open to continuous shrub layer (12-85%, mean 41.8%), where *Adenostoma fasciculatum* is often dominant or sometimes co-dominant. The shrub layer is often in two different strata, with low shrubs at 0-2m tall and tall shrubs at 0.5-5m tall. The herbaceous layer is open to intermittent (0.2-65%, mean 19.9%) at 0-2m tall. Trees infrequently occur in the emergent layer (0.2-3% cover, mean 1.1%) at 5-15m tall, which may include *Quercus agrifolia* at trace cover. Total vegetation cover is 20-85% (mean 54.7%).

In the ***Adenostoma fasciculatum* Pure Association,** *Adenostoma fasciculatum* is the sole dominant species in the shrub overstory. *Yucca whipplei* and *Eriogonum fasciculatum* occur occasionally at trace cover.

In the ***Adenostoma fasciculatum-Arctostaphylos pringlei* Association,** *Adenostoma fasciculatum* is co-dominant with *Arctostaphylos pringlei* in an intermittent to continuous shrub layer, while other species (e.g., *Ceanothus cuneatus* and *Yucca whipplei*) may occur at low cover.

In the ***Adenostoma fasciculatum-Eriogonum fasciculatum* Association,** both species are consistently present in an open to intermittent shrub overstory, where *Adenostoma fasciculatum* is dominant or co-dominant with *Eriogonum fasciculatum*. Other species (e.g., *Salvia mellifera*, *Arctostaphylos glauca*, *Encelia farinosa* and *Rhus ovata*) often intermix in the shrub layer at low cover.

In the ***Adenostoma fasciculatum-Eriogonum fasciculatum-Salvia apiana* Association,** all three shrub species are characteristically present and *Adenostoma fasciculatum* is either dominant or co-dominant. The shrub layer is intermittent to continuous and frequently includes *Quercus berberidifolia* and *Yucca whipplei*.

In the ***Adenostoma fasciculatum-Malosma laurina* Association,** both species are consistently present and usually co-dominant in the shrub layer. *Ceanothus leucodermis*, *Yucca whipplei*, and *Eriogonum fasciculatum* are often present at low cover.

In the ***Adenostoma fasciculatum* Disturbance Association,** *Adenostoma fasciculatum* is often sparse in cover and intermixes with other shrubs (e.g., *Lotus scoparius*, *Malacothamnus fasciculatus*, *Eriodictyon crassifolius*, *Rhus ovata*, *Eriogonum fasciculatum*, and *Salvia mellifera*) in the open to intermittent shrub layer.

Arctostaphylos rainbowensis, a CNPS List 1B species (CNPS 2005), was found in 1 of 41 surveys of the *Adenostoma fasciculatum* Alliance. See Appendix 3 for more information on this plant.

Calochortus plummerae, a CNPS List 1B species (CNPS 2005), was found in 1 of 41 surveys of the *Adenostoma fasciculatum* Alliance. See Appendix 3 for more information on this plant.

Tetracoccus dioicus, a CNPS List 1B species (CNPS 2005), was found in 1of 41 surveys of the *Adenostoma fasciculatum* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid elevations, range 948-5,238 ft., mean 2,588 ft.
Aspect: all aspects (except flat)
Slope: gentle to steep, range 3-40 degrees, mean 18.4 degrees
Topography: variable, but more often undulating, bottom to top slopes
Litter Cover: range 0-85%, mean 25.5%
Rock Cover: range 0-68%, mean 33.3%
Bare ground: range 2-87%, mean 33.9%
Parent Material: more often Mesozoic granite, less often gabbro and diorite, sedimentary, metavolcanic, or mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, but varies from medium sand to loam

The *Adenostoma fasciculatum* Alliance was one of the most commonly sampled associations, found in all but one subsection of the study area: Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl), and San Jacinto Mountains (M262Bm). It occurred in a variety of geologic settings and elevations in relatively dry site locations.

Samples used to describe alliance: (n=41) WRAA.015, WRAA.021, WRAA.022, WRAA.023, WRAA.031, WRAA.033, WRAA.083, WRAA.084, WRAA.095, WRIV0127, WRIV0143, WRIV0193, WRIV0283, WRIV0311, WRIV0313, WRIV0319, WRIV0320, WRIV0369, WRIV0371, WRIV0438, WRIV0441, WRIV0442, WRIV0443, WRIV0445, WRIV0446, WRIV0447, WRIV0466, WRIV0467, WRIV0469, WRIV0490, WRIV0525, WRIV0533, WRIV0797, WRIV0802, WRIV0805, WRIV0812, WRIV0819, WRIV0821, WRIV0855, WRIV0956, WRIV0988

RANK: G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: inner North Coast, Central Coast (including Mount Tamalpais, Mount Diablo, Red Mountains of the Mount Hamilton Range, Santa Clara County, San Benito County, Los Padres National Forest), Klamath foothills, Sierra Nevada foothills, montane Sierra Nevada (including Yosemite), Southern California (including inner South Coast and Santa Monica, San Gabriel, Santa Ana, San Jacinto, and San Bernardino Mountains), Anza-Borrego Desert, Channel Islands, Mojave Desert, Baja California

Adenostoma fasciculatum (pure) Association: Sierra Nevada foothills (including Yosemite region), Central Coast (including Santa Clara County to San Benito County), South Coast (Ventura to San Diego County), Peninsular Ranges (Western Riverside to San Diego Counties)
Adenostoma fasciculatum-Arctostaphylos pringlei Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains), though full distribution is not known
Adenostoma fasciculatum-Eriogonum fasciculatum Association: South Coast, Transverse Ranges (including Santa Monica Mountains), and Peninsular Ranges in Western Riverside County, though full distribution is not known
Adenostoma fasciculatum-Eriogonum fasciculatum-Salvia apiana Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains), though full distribution is not known
Adenostoma fasciculatum-Malosma laurina Association: Transverse and Peninsular Ranges (Santa Monica Mountains; Western Riverside County: Santa Ana Mountains), though full distribution is not known
Adenostoma fasciculatum disturbance Association: South Coast and Peninsular Ranges in Western Riverside County, and potentially range of alliance, though distribution is not known

REFERENCES

Borchert et al. 2004, Boyd et al. 1995, CDFG 1998, CNPS 2005, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Ertter and Bowerman 2002, Evens and San 2004, Evens and San In publication, Gordon and White 1994, Hanes 1976, Keeler-Wolf 1990, Minnich 1976, NatureServe et al. 2003a, NatureServe et al. 2003b, NatureServe 2004, Sawyer and Keeler-Wolf 1995, Sharsmith 1982, Shuford and Timossi 1989, Vogl 1976

***Adenostoma fasciculatum* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ADFA	*Adenostoma fasciculatum*	100	26	3	80
	ERFA2	*Eriogonum fasciculatum*	70.7	4.1	0.2	23
	YUWH	*Yucca whipplei*	39	0.3	0.2	2
	RHOV	*Rhus ovata*	36.6	1.2	0.2	12
	SAME3	*Salvia mellifera*	34.1	1.6	0.2	17
	QUBE5	*Quercus berberidifolia*	26.8	1	0.2	16
Herb	BRMA3	*Bromus madritensis*	36.6	2.4	0.2	40
	SCBA	*Schismus barbatus*	29.3	1.9	0.2	19
	CAMIS	*Camissonia*	26.8	0.7	1	7
	MAMA8	*Marah macrocarpus*	26.8	0.2	0.2	3
	ERCI6	*Erodium cicutarium*	24.4	2	0.2	23
	CRIN8	*Cryptantha intermedia*	24.4	0.9	0.2	8
	AMME	*Amsinckia menziesii*	22	1.5	0.2	33
	SACO6	*Salvia columbariae*	19.5	0.2	0.2	2

***Adenostoma fasciculatum-Arctostaphylos glandulosa* Alliance (Chamise – Eastwood Manzanita)**

ASSOCIATIONS
Adenostoma fasciculatum-Arctostaphylos glandulosa
Adenostoma fasciculatum-Arctostaphylos glandulosa-Ceanothus crassifolius
Adenostoma fasciculatum-Arctostaphylos glandulosa-Ceanothus leucodermis

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum-Arctostaphylos glandulosa* Shrubland form an open to continuous shrub layer (30-88%, mean 58%), where both species usually co-dominate. Shrubs occasionally occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open (0.2-23%, 3.3%) at 0-0.5 m tall. Trees occur infrequently in an emergent layer (0.2-6% cover, mean 1.9%) at 5-15m tall, including *Pinus coulteri*. Total vegetation cover is 30-88% (mean 59.2%).

In the ***Adenostoma fasciculatum-Arctostaphylos glandulosa* Association,** *Adenostoma fasciculatum* and *Arctostaphylos glandulosa* are consistently present and both species are usually co-dominant, though *Arctostaphylos glandulosa* may be sub-dominant to *Adenostoma fasciculatum*. Other chaparral shrubs often intermix as sub-dominants, including *Quercus berberidifolia, Heteromeles arbutifolia,* and *Garrya flavescens*.

In the ***Adenostoma fasciculatum-Arctostaphylos glandulosa-Ceanothus crassifolius* Association,** all three species are co-dominant shrubs. Other occasionally present chaparral shrubs include *Quercus berberidifolia*, *Ceanothus leucodermis*, and *Quercus wislizeni*.

In the ***Adenostoma fasciculatum-Arctostaphylos glandulosa-Ceanothus leucodermis* Association,** *Ceanothus leucodermis* is consistently present as a sub-dominant shrub. *Quercus wislizeni* is often present at sparse cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2,878-5,610 ft., mean 4,143 ft.
Aspect: variable
Slope: gentle to steep, range 4-38 degrees, mean 21.4 degrees
Topography: more often convex or undulating, less often flat, mid to top slopes
Litter Cover: range 2-88%, mean 34.9%
Rock Cover: range 2-90%, mean 47.1%
Bare ground: range 0-55%, mean 13.5%
Parent Material: more often Mesozoic granite or sedimentary, less often mixed granitic and metamorphic
Soil Texture: more often moderately coarse sandy loam, but varies from sand to moderately fine sandy clay loam

The *Adenostoma fasciculatum-Arctostaphylos glandulosa* Alliance was sampled in the lower to mid-montane zones of the Santa Ana Mountains (M262Bf), San Jacinto Foothills - Cahuilla Mountains (M262Bl), and San Jacinto Mountains (M262Bm) Subsections.

Samples used to describe alliance: (n=19) WRIV0224, WRIV0226, WRIV0229, WRIV0240, WRIV0244, WRIV0252, WRIV0333, WRIV0335, WRIV0343, WRIV0378, WRIV0380, WRIV0613, WRIV0700, WRIV0835, WRIV0854, WRIV0863, WRIV0891, WRIV0892, WRIV0910

RANK: G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: North to South Coast (including Mendocino National Forest, Los Padres National Forest, and Santa Monica Mountains), montane Peninsular Ranges (San Bernardino and San Jacinto Mountains south to Palomar Mountains/hills north and east of Ramona-San Diego County), Anza-Borrego Desert

Adenostoma fasciculatum-Arctostaphylos glandulosa Association: Transverse and Peninsular Ranges (Santa Monica Mountains, Western Riverside and San Diego Counties foothills and mountains), though full distribution is not known
Adenostoma fasciculatum-Arctostaphylos glandulosa-Ceanothus crassifolius Association: Peninsular Ranges (Western Riverside County: Santa Ana and San Jacinto Mountains and Foothills), though full distribution is not known
Adenostoma fasciculatum-Arctostaphylos glandulosa-Ceanothus leucodermis Association: Peninsular Ranges (Western Riverside County: Santa Ana and San Jacinto Mountains), though full distribution is not known

REFERENCES
Borchert et al. 2004, CDFG 1998, CNPS and CDFG 2005b, Evens and San In publication, Gordon and White 1994, Keeler-Wolf 1990, Parker 1990, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Adenostoma fasciculatum-Arctostaphylos glandulosa* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PICO3-t	*Pinus coulteri*	21.1	0.3	0.2	4
Tree Understory	QUWI2-m	*Quercus wislizeni*	31.6	0.7	0.2	5
Shrub	ARGL3	*Arctostaphylos glandulosa*	100	25.9	0.2	48
	ADFA	*Adenostoma fasciculatum*	100	23.6	8	78
	CELE2	*Ceanothus leucodermis*	42.1	1.5	0.2	12
	QUBE5	*Quercus berberidifolia*	31.6	0.7	0.2	7
	YUWH	*Yucca whipplei*	31.6	0.1	0.2	0.2
	HEAR5	*Heteromeles arbutifolia*	21.1	0.3	0.2	3
	GAFL2	*Garrya flavescens*	21.1	0.1	0.2	1
Herb	CAMIS	*Camissonia*	21.1	0.1	0.2	1

***Adenostoma fasciculatum-Arctostaphylos glauca* Alliance (Chamise – Bigberry Manzanita)**

ASSOCIATIONS
Adenostoma fasciculatum-Arctostaphylos glauca
Adenostoma fasciculatum-Arctostaphylos glauca-Rhus ovata

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum-Arctostaphylos glauca* Shrubland form an intermittent to continuous shrub layer (45-70%, mean 59.3%), where both species generally co-dominate. Shrubs occasionally occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is open to intermittent (5-40%, mean 18.6%) at 0-1m tall, including a variety of native and non-native species (see species table). Total vegetation cover is 55-80% (mean 69.9%).

In the ***Adenostoma fasciculatum-Arctostaphylos glauca* Association,** the two species are consistently co-dominant in the intermittent to dense shrub overstory. A variety of other chaparral species intermix as sub-dominants shrubs (e.g., *Garrya flavescens, Keckiella antirrhinoides, Prunus ilicifolia, Heteromeles arbutifolia*).

In the ***Adenostoma fasciculatum-Arctostaphylos glauca-Rhus ovata* Association,** *Adenostoma fasciculatum* and *Arctostaphylos glauca* generally co-dominate in the overstory shrub layer, and *Rhus ovata* is characteristically present as a sub-dominant or co-dominant shrub. *Salvia mellifera* is often present at sparse cover.

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 1 of 10 surveys of the *Adenostoma fasciculatum-Arctostaphylos glauca* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2,224 to 3,943 ft., mean 2,745 ft.
Aspect: more often NE and NW, less often SE and SW
Slope: moderate to steep, range 14 to 38 degrees, mean 24 degrees
Topography: most often undulating, less often convex, low to top slopes
Litter Cover: range 18-85%, mean 47.5%
Rock Cover: range 6-50%, mean 23%
Bare ground: range 10-50%, mean 25.1%
Parent Material: mixed granitic and metamorphic, nonmarine sedimentary, Mesozoic granite, mixed metamorphic and igneous
Soil Texture: more often medium to very fine sandy loam, less often fine sand or moderately coarse sandy clay loam

The *Adenostoma fasciculatum-Arctostaphylos glauca* Alliance was sampled in the eastern portion of the study area in the San Gorgonio Mountains (M262Bg), San Jacinto Foothills - Cahuilla Mountains (M262Bl), and San Jacinto Mountains (M262Bm) Subsections.

Samples used to describe alliance: (n=10) WRAA.014, WRAA.017, WRAA.088, WRAA.093, WRAA.097, WRAA.099, WRIV0583, WRIV0883, WRIV0884, WRIV0965

RANK: G1 S1, G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Central to South Coast (including Contra Costa County south to Santa Barbara and Ventura Counties), Transverse and Peninsular Ranges (in most sections of these ranges, but not well represented in the Santa Ana Mountains), Baja California

Adenostoma fasciculatum-Arctostaphylos glauca Association: Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (including San Diego County: western foothills; Western

Riverside County: San Gorgonio and San Jacinto Mountains and San Jacinto Foothills – Cahuilla Mountains Subsections), and potentially north to the Central Coast
Adenostoma fasciculatum-Arctostaphylos glauca-Rhus ovata Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains and San Jacinto Mountains Subsections), though full distribution is not known

REFERENCES

Borchert et al. 2004, CNPS 2005, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San 2004, Evens and San In publication, Gordon and White 1994, Sawyer and Keeler-Wolf 1995

***Adenostoma fasciculatum-Arctostaphylos glauca* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ADFA	*Adenostoma fasciculatum*	100	28.2	10	45
	ARGL4	*Arctostaphylos glauca*	100	17.6	3	33
	RHOV	*Rhus ovata*	60	4.3	2	11
	KEAN	*Keckiella antirrhinoides*	40	1.9	3	7
	SAME3	*Salvia mellifera*	40	1.2	0.2	5
	ERFA2	*Eriogonum fasciculatum*	40	0.6	0.2	3
	QUBE5	*Quercus berberidifolia*	30	0.6	1	3
	HEAR5	*Heteromeles arbutifolia*	30	0.2	0.2	2
	YUWH	*Yucca whipplei*	30	0.1	0.2	1
	FRDI2	*Fraxinus dipetala*	20	1	0.2	10
	CEBE3	*Cercocarpus betuloides*	20	0.4	0.2	4
	RHCR	*Rhamnus crocea*	20	0.2	0.2	2
Herb	BRMA3	*Bromus madritensis*	70	3.9	2	17
	PTDR	*Pterostegia drymarioides*	40	4.2	7	15
	EUCH	*Eucrypta chrysanthemifolia*	30	1.3	1	10
	CRMU2	*Cryptantha muricata*	30	0.5	1	2
	MAMA8	*Marah macrocarpus*	30	0.4	0.2	2
Cryptogam	SEBI	*Selaginella bigelovii*	20	1	5	5

***Adenostoma fasciculatum-Ceanothus crassifolius* Alliance (Chamise-Hoaryleaf Ceanothus)**

ASSOCIATIONS
Adenostoma fasciculatum-Ceanothus crassifolius-Rhus ovata
Adenostoma fasciculatum-Ceanothus crassifolius-Salvia mellifera

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum-Ceanothus crassifolius* Shrubland form an intermittent to continuous shrub layer (34-80%, mean 56.6%), where both shrub species usually co-dominate. The shrub layer frequently is in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open (0.2-31%, mean 7%) at 0-1m tall. Emergent trees occur infrequently (0.2-1% cover, mean 0.5%) at 5-20m tall. Total vegetation cover is 35-88% (mean 60.3%).

In the ***Adenostoma fasciculatum-Ceanothus crassifolius-Rhus ovata* Association** *Adenostoma fasciculatum* and *Ceanothus crassifolius* are usually co-dominant in the intermittent to continuous shrub layer, though sometimes *Ceanothus crassifolius* is subdominant. *Rhus ovata* is characteristically present as a sub-dominant shrub. *Quercus agrifolia* and *Populus fremontii* occur infrequently at trace cover in the overstory tree layer.

In the ***Adenostoma fasciculatum-Ceanothus crassifolius-Salvia mellifera* Association,** *Adenostoma fasciculatum* and *Ceanothus crassifolius* usually co-dominate in the overstory shrub layer, and *Salvia mellifera* is characteristically present as a sub-dominant or co-dominant shrub. A variety of native and non-native species occupy the herb understory, the most common being *Marah macrocarpus* and *Hirschfeldia incana*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 758-2,809 ft., mean 1,804 ft.
Aspect: all aspects (except flat)
Slope: moderate to steep, range 7 to 40 degrees, mean 20 degrees
Topography: variable, but more often undulating, bottom to top slopes
Litter Cover: range 0-80%, mean 44%
Rock Cover: range 1-73%, mean 23.4%
Bare ground: range 2-75%, mean 24.1%
Parent Material: Mesozoic granite, gabbro and diorite, sedimentary and alluvium, metavolcanic
Soil Texture: more often medium to very fine sandy loam or medium loam, but varies from sand to moderately fine sandy clay loam

The *Adenostoma fasciculatum-Ceanothus crassifolius* Alliance was consistently sampled in the Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections at lower elevation chaparral sites.

Samples used to describe alliance: (n=38) WRAA.024, WRAA.042, WRAA.155, WRAA.156, WRIV0017, WRIV0030, WRIV0105, WRIV0107, WRIV0110, WRIV0111, WRIV0112, WRIV0113, WRIV0115, WRIV0116, WRIV0186, WRIV0188, WRIV0190, WRIV0191, WRIV0234, WRIV0236, WRIV0237, WRIV0241, WRIV0250, WRIV0251, WRIV0267, WRIV0268, WRIV0279, WRIV0323, WRIV0507, WRIV0514, WRIV0528, WRIV0543, WRIV0546, WRIV0548, WRIV0581, WRIV0600, WRIV0609, WRIV1000

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: inner South Coast (including Western Riverside County), montane Transverse and Peninsular Ranges (including Santa Monica, Santa Ana, San Gabriel, and San Bernardino Mountains)

Adenostoma fasciculatum-Ceanothus crassifolius-Rhus ovata Association: Peninsular Ranges and inner South Coast (Western Riverside County: Santa Ana Mountains, Perris Valley and Hills, and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known
Adenostoma fasciculatum-Ceanothus crassifolius-Salvia mellifera Association: Peninsular Ranges and inner South Coast (Western Riverside County: Santa Ana Mountains, Perris Valley and Hills, and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known

REFERENCES

CNPS and CDFG 2005b, Gordon and White 1994, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Adenostoma fasciculatum-Ceanothus crassifolius* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ADFA	*Adenostoma fasciculatum*	100	25.9	5	57
	CECR	*Ceanothus crassifolius*	100	22.7	3	46
	ERFA2	*Eriogonum fasciculatum*	68.4	2.9	0.2	17
	RHOV	*Rhus ovata*	68.4	1.9	0.2	14
	SAME3	*Salvia mellifera*	57.9	4.4	0.2	26
	MALA6	*Malosma laurina*	34.2	1	0.2	7
	QUBE5	*Quercus berberidifolia*	28.9	0.9	0.2	12
	YUWH	*Yucca whipplei*	23.7	0.1	0.2	1
	RHCR	*Rhamnus crocea*	21.1	0.1	0.2	1
Herb	BRMA3	*Bromus madritensis*	34.2	1	0.2	15
	MAMA8	*Marah macrocarpus*	31.6	0.6	0.2	6
Cryptogam	LICHEN	Lichen	15.8	1.1	1	12

***Adenostoma fasciculatum-Ceanothus cuneatus* Alliance (Chamise – Wedgeleaf Ceanothus)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum-Ceanothus cuneatus* Shrubland form an intermittent shrub layer (45-62%, mean 55.7%), where both species usually co-dominate. The shrub layer is often in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5mtall. The herbaceous layer is open to intermittent (0.2-35%, mean 13.4%) at 0-0.5m tall. Total vegetation cover is 62-70% (mean 65%).

In this alliance, *Adenostoma fasciculatum* and *Ceanothus cuneatus* usually co-dominate. In two of the three stands sampled, *Cercocarpus betuloides* and *Arctostaphylos pungens* also occurred. A variety of native and non-native herbs occupy the understory.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3,690-4,474 ft., mean 4,027 ft.
Aspect: variable
Slope: gentle to somewhat steep, range 3-20 degrees, mean 11 degrees
Topography: convex or undulating, lower to mid slopes
Litter Cover: range 0-30%, mean 16%
Rock Cover: range 27-51%, mean 37.7%
Bare ground: range 15-53%, mean 39.3%
Parent Material: alluvium, Mesozoic granite
Soil Texture: varies from moderately coarse to very fine sandy loam

The *Adenostoma fasciculatum-Ceanothus cuneatus* Alliance was sampled in the San Jacinto Foothills - Cahuilla Mountains (M262BI) and San Jacinto Mountains (M262Bm) Subsections, as a infrequent community at higher elevation chaparral sites.

Samples used to describe alliance: (n=3) WRIV0078, WRIV0743, WRIV0871

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: inner North Coast, Central Coast, Sierra Nevada foothills, montane Transverse Ranges (including Santa Monica Mountains), South Coast, montane Peninsular Ranges (including Western Riverside County: San Jacinto Mountains and foothills)

REFERENCES
Borchert et al. 2004, CNPS and CDFG 2005b, Evens and San 2004, Gordon and White 1994, NatureServe et al. 2003b, Sawyer and Keeler-Wolf 1995

***Adenostoma fasciculatum-Ceanothus cuneatus* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Understory	QUWI2-m	*Quercus wislizeni*	33.3	0.7	2	2
Shrub	ADFA	*Adenostoma fasciculatum*	100	30	28	32
	CECU	*Ceanothus cuneatus*	100	20	6	32
	ARPU5	*Arctostaphylos pungens*	66.7	4.7	2	12
	CEBE3	*Cercocarpus betuloides*	66.7	0.4	0.2	1
	TRPA3	*Trichostema parishii*	33.3	0.7	2	2
	ARGL4	*Arctostaphylos glauca*	33.3	0.3	1	1
	GAVE2	*Garrya veatchii*	33.3	0.3	1	1
	GUSA2	*Gutierrezia sarothrae*	33.3	0.3	1	1
	YUWH	*Yucca whipplei*	33.3	0.3	1	1
Herb	BRTE	*Bromus tectorum*	66.7	5.1	0.2	15
	PTDR	*Pterostegia drymarioides*	33.3	2.7	8	8
	MAMA8	*Marah macrocarpus*	33.3	2.3	7	7
	ERSA	*Eriastrum sapphirinum*	33.3	1.3	4	4
	FICA2	*Filago californica*	33.3	1.3	4	4
	CRMU2	*Cryptantha muricata*	33.3	1	3	3
	CAMIS	*Camissonia*	33.3	0.7	2	2
	CRYPT	*Cryptantha*	33.3	0.7	2	2
	MIFR2	*Mimulus fremontii*	33.3	0.3	1	1
	CAMO5	*Calyptridium monandrum*	33.3	0.1	0.2	0.2
	LOST4	*Lotus strigosus*	33.3	0.1	0.2	0.2
	PLCO13	*Plagiobothrys collinus*	33.3	0.1	0.2	0.2
	VULPI	*Vulpia*	33.3	0.1	0.2	0.2

***Adenostoma fasciculatum-Ceanothus greggii* Alliance (Chamise – Cupleaf Ceanothus)**

ASSOCIATIONS
Adenostoma fasciculatum-Ceanothus greggii

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum-Ceanothus greggii* Shrubland form an intermittent to continuous shrub layer (40-68%, mean 55.3%), where *Adenostoma fasciculatum* co-dominates with *Ceanothus greggii*. The shrub layer is often in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open (0.2-15%, mean 7.3%) at 0-0.5m tall. Emergent trees occur infrequently (0.2% cover, mean 0.2%) at 10-15m. Total vegetation cover is 50-75% (mean 60.5%).

In the ***Adenostoma fasciculatum-Ceanothus greggii* Association**, *Adenostoma fasciculatum* and *Ceanothus greggii* consistently co-dominate. Other shrub species (e.g., *Arctostaphylos pungens*, *Salvia mellifera*, *Quercus berberidifolia*, *Cercocarpus betuloides*, *Arctostaphylos glauca*) frequently intermix as sub-dominants and occasionally as co-dominants. *Quercus agrifolia* occurs infrequently in the tree overstory at trace cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2,145-3,940 ft., mean 2,916 ft.
Aspect: more often NE, less often SW
Slope: somewhat steep to steep, range 20-33 degrees, mean 23.8 degrees
Topography: undulating or convex, mid to upper slopes
Litter Cover: range 10-88%, mean 47.5%
Rock Cover: range 3-70%, mean 27.5%
Bare ground: range 5-60%, mean 21.3%
Parent Material: Mesozoic granite, nonmarine sedimentary
Soil Texture: varies from coarse loamy sand to moderately fine sandy clay loam

The *Adenostoma fasciculatum-Ceanothus greggii* Alliance was sampled in the drier, eastern foothills of the study area, within the San Jacinto Foothills - Cahuilla Mountains (M262BI) and San Jacinto Mountains (M262Bm) Subsections.

Samples used to describe alliance: (n=4) WRIV0006, WRIV0567, WRIV0840, WRIV0857

RANK: G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Central Coast, montane Transverse and Peninsular Ranges (including San Bernardino Mountains and Western Riverside and San Diego Counties), Anza-Borrego Desert, Baja California

Adenostoma fasciculatum-Ceanothus greggii Association: Transverse Ranges (San Bernardino Mountains), Peninsular Ranges (Western Riverside County: San Jacinto Mountains and foothills; San Diego County: western foothills), Anza Borrego Desert and San Felipe Valley desert slopes

REFERENCES
CDFG 1998, Evens and San In publication, Gordon and White 1994, Sawyer and Keeler-Wolf 1995

***Adenostoma fasciculatum-Ceanothus greggii* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	QUAG-t	*Quercus agrifolia*	25	0.1	0.2	0.2
Tree Understory	QUWI2-m	*Quercus wislizeni*	25	0.8	3	3
Shrub	ADFA	*Adenostoma fasciculatum*	100	26.5	17	35
	CEGR	*Ceanothus greggii*	100	15.8	13	19
	ARPU5	*Arctostaphylos pungens*	50	4	7	9
	QUBE5	*Quercus berberidifolia*	50	2.5	2	8
	SAME3	*Salvia mellifera*	50	2.5	2	8
	RHOV	*Rhus ovata*	50	1.3	0.2	5
	CEBE3	*Cercocarpus betuloides*	50	1.3	2	3
	ERFA2	*Eriogonum fasciculatum*	50	0.8	1	2
	ARGL4	*Arctostaphylos glauca*	25	3	12	12
	DERI	*Dendromecon rigida*	25	0.5	2	2
	ARCA11	*Artemisia californica*	25	0.3	1	1
	CEOL	*Ceanothus oliganthus*	25	0.3	1	1
	ERCO25	*Eriophyllum confertiflorum*	25	0.3	1	1
	YUSC2	*Yucca schidigera*	25	0.3	1	1
	RHCR	*Rhamnus crocea*	25	0.1	0.2	0.2
	RHTR	*Rhus trilobata*	25	0.1	0.2	0.2
	TRPA3	*Trichostema parishii*	25	0.1	0.2	0.2
	YUWH	*Yucca whipplei*	25	0.1	0.2	0.2
Herb	EUCH	*Eucrypta chrysanthemifolia*	50	3.3	0.2	13
	BRMA3	*Bromus madritensis*	50	0.3	0.2	1
	HIIN3	*Hirschfeldia incana*	50	0.3	0.2	1
	CAMIS	*Camissonia*	25	0.8	3	3
	CRIN8	*Cryptantha intermedia*	25	0.8	3	3
	MAMA8	*Marah macrocarpus*	25	0.5	2	2
	BRTE	*Bromus tectorum*	25	0.3	1	1
	SCBA	*Schismus barbatus*	25	0.3	1	1
	CEME2	*Centaurea melitensis*	25	0.1	0.2	0.2
	CRYPT	*Cryptantha*	25	0.1	0.2	0.2
	FIGA	*Filago gallica*	25	0.1	0.2	0.2
	PLAGI	*Plagiobothrys*	25	0.1	0.2	0.2
Cryptogam	MOSS	Moss	25	1.3	5	5

***Adenostoma fasciculatum-Salvia apiana* Alliance (Chamise - White Sage)**

ASSOCIATIONS
Adenostoma fasciculatum-Salvia apiana-Artemisia californica

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum-Salvia apiana* Shrubland form an intermittent to continuous shrub layer (35-78%, mean 53.2%), where *Adenostoma fasciculatum* dominates and *Salvia apiana* sub-dominates. The shrub layer is often in two different strata, with low shrubs at 0.5-1m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to continuous (2-60%, mean 22.6%) at 0-1m tall. Total vegetation cover is 41-90% (mean 68.6%).

In the **A*denostoma fasciculatum-Salvia apiana-Artemisia californica* Association,** all three species are consistently present in the shrub overstory. *Adenostoma fasciculatum* dominates or co-dominates with *Artemisia californica*, while *Salvia apiana* and *Yucca whipplei* consistently sub-dominate. *Malosma laurina*, *Eriogonum fasciculatum*, and *Salvia mellifera* are occasionally to often present at sparse cover. A variety of species occupy the understory, especially native herbs (see species table).

Tetracoccus dioicus, a CNPS List 1B species (CNPS 2005), was found in 1 of 11 surveys of the *Adenostoma fasciculatum-Salvia apiana* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 681-1,293 ft., mean 974 ft.
Aspect: variable, but more often SE and SW
Slope: moderate to steep, range 8-38 degrees, mean 19.5 degrees
Topography: undulating or convex, lower to top slopes
Litter Cover: range 18-65%, mean 48.3%
Rock Cover: range 4-61%, mean 23.4%
Bare ground: range 5-65%, mean 21.8%
Parent Material: gabbro and diorite, Mesozoic granite
Soil Texture: varies from medium sandy loam to clay

The *Adenostoma fasciculatum-Salvia apiana* Alliance was sampled only within the Santa Ana Mountains (M262Bf) Subsection, primarily at lower elevations of the region.

Samples used to describe alliance: (n=11) WRIV0270, WRIV0274, WRIV0277, WRIV0278, WRIV0282, WRIV0284, WRIV0502, WRIV0503, WRIV0504, WRIV1006, WRIV1007

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: widely distributed in the Transverse Ranges and Peninsular Ranges (including Western Riverside and San Diego Counties)

Adenostoma fasciculatum-Salvia apiana-Artemisia californica Association: Peninsular Ranges (including Western Riverside County: Santa Ana Mountains; San Diego County: western foothills)

REFERENCES
CNPS 2005, Evens and San In publication, Sawyer and Keeler-Wolf 1995

***Adenostoma fasciculatum-Salvia apiana* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ADFA	*Adenostoma fasciculatum*	100	30.8	17	57
	ARCA11	*Artemisia californica*	100	14.4	2	39
	SAAP2	*Salvia apiana*	100	4.8	0.2	20
	YUWH	*Yucca whipplei*	100	1	0.2	2
	MALA6	*Malosma laurina*	63.6	0.9	0.2	5
	ERFA2	*Eriogonum fasciculatum*	45.5	1.5	1	6
	SAME3	*Salvia mellifera*	27.3	0.4	0.2	3
Herb	MICA6	*Mirabilis californica*	63.6	1	0.2	4
	CEME2	*Centaurea melitensis*	54.5	1	0.2	4
	HIIN3	*Hirschfeldia incana*	45.5	5.8	0.2	25
	PTDR	*Pterostegia drymarioides*	45.5	3.2	2	10
	CRIN8	*Cryptantha intermedia*	45.5	2	0.2	10
	BRMA3	*Bromus madritensis*	36.4	5.4	10	20
	MAMA8	*Marah macrocarpus*	36.4	0.1	0.2	1
	NAPU4	*Nassella pulchra*	27.3	0.7	0.2	5
	GAAN2	*Galium angustifolium*	27.3	0.5	1	4
	CHFI2	*Chorizanthe fimbriata*	18.2	1.5	1	15
	HEFA	*Hemizonia fasciculata*	18.2	0.7	3	5
	EUCH	*Eucrypta chrysanthemifolia*	18.2	0.6	2	5
	SACO6	*Salvia columbariae*	18.2	0.1	0.2	1
	LICHEN	Lichen	18.2	0.3	1	2

***Adenostoma fasciculatum-Salvia mellifera* Alliance (Chamise – Black Sage)**

ASSOCIATIONS
Adenostoma fasciculatum-Salvia mellifera
Adenostoma fasciculatum-Salvia mellifera-Artemisia californica
Adenostoma fasciculatum-Salvia mellifera-Ceanothus crassifolius

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum-Salvia mellifera* Shrubland form an open to continuous shrub layer (10-75%, mean 44.2%), where *Adenostoma fasciculatum* usually co-dominates with *Salvia mellifera*. The shrub layer is often in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to continuous (0.2-75%, mean 22.7%) at 0-1m tall, with a variety of native and non-native species (see species table). Total vegetation cover is 38-85% (mean 59.2%).

In the mixed ***Adenostoma fasciculatum-Salvia mellifera* Association,** both species co-dominate in the overstory shrub layer, while *Rhus ovata* and *Rhamnus crocea* are often present at low cover.

In the ***Adenostoma fasciculatum-Salvia mellifera-Artemisia californica* Association,** *Artemisia californica* is consistently present as a sub-dominant shrub and *Eriogonum fasciculatum* is characteristically present at sparse cover.

In the ***Adenostoma fasciculatum-Salvia mellifera-Ceanothus crassifolius* Association,** *Adenostoma fasciculatum and Salvia mellifera* co-dominate while *Ceanothus crassifolius* usually sub-dominates. *Eriogonum fasciculatum*, *Yucca whipplei*, *Helianthemum scoparium*, and *Rhus ovata* are occasionally present at low cover.

In the ***Adenostoma fasciculatum-Salvia mellifera* disturbance Association,** both *Adenostoma fasciculatum* and *Salvia mellifera* have low cover and intermix with other shrub species (e.g. *Rhus ovata*, *Lotus scoparius*, *Rhamnus crocea*, *Eriogonum fasciculatum*) in an open to intermittent shrub layer.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 828-3,281 ft., mean 2,240 ft.
Aspect: all aspects (except flat)
Slope: gentle to steep, range 2-36 degrees, mean 19.1 degrees
Topography: variable, but more often undulating, bottom to top slopes
Litter Cover: range 3-80%, mean 25%
Rock Cover: range 4-65%, mean 30.8%
Bare ground: range 5-75%, mean 39.8%
Parent Material: more often Mesozoic granite, less often sedimentary, metamorphic, gabbro and diorite, metavolcanic,
Soil Texture: varies from moderately coarse sandy loam to moderately fine silty clay loam

The *Adenostoma fasciculatum-Salvia mellifera* Alliance was consistently sampled in the lower hills and foothills of the Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections.

Samples used to describe alliance: (n=26) WRAA.011, WRAA.012, WRIV0009, WRIV0014, WRIV0145, WRIV0187, WRIV0197, WRIV0299, WRIV0387, WRIV0390, WRIV0419, WRIV0427, WRIV0448, WRIV0476, WRIV0484, WRIV0485, WRIV0487, WRIV0489, WRIV0505, WRIV0534, WRIV0571, WRIV0602, WRIV0616, WRIV0978, WRIV1002, WRIV1005

RANK: G5 S5

GLOBAL DISTRIBUTION
Alliance: Central Coast (including Santa Clara and San Benito Counties), Southern California (including South Coast and Santa Monica, Santa Ana, San Jacinto, San Gabriel, and San Bernardino Mountains)

Adenostoma fasciculatum-Salvia mellifera Association: same distribution as alliance
Adenostoma fasciculatum-Salvia mellifera-Artemisia californica Association: inner South Coast and Peninsular Ranges (Western Riverside County: Perris Valley and Hills and Santa Ana Mountains Subsections), though full distribution is not known
Adenostoma fasciculatum-Salvia mellifera-Ceanothus crassifolius Association: inner South Coast and Peninsular Ranges (Western Riverside County: Perris Valley and Hills, Santa Ana Mountains, and San Jacinto Foothills – Cahuilla Mountains Subsections), though full distribution is not known

REFERENCES
CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San 2004, Gordon and White 1994, Sawyer and Keeler-Wolf 1995

***Adenostoma fasciculatum-Salvia mellifera* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ADFA	*Adenostoma fasciculatum*	100	21.4	0.2	48
	SAME3	*Salvia mellifera*	100	13.2	0.2	30
	ERFA2	*Eriogonum fasciculatum*	50	1.7	1	10
	RHOV	*Rhus ovata*	50	0.5	0.2	3
	CECR	*Ceanothus crassifolius*	38.5	1.7	0.2	18
	YUWH	*Yucca whipplei*	34.6	0.2	0.2	2
	ARCA11	*Artemisia californica*	30.8	1.2	0.2	18
	LOSC2	*Lotus scoparius*	26.9	1.5	0.2	18
Herb	BRMA3	*Bromus madritensis*	53.8	5	1	33
	HIIN3	*Hirschfeldia incana*	34.6	4.3	2	36
	ERCI6	*Erodium cicutarium*	34.6	2.9	2	30
	CRIN8	*Cryptantha intermedia*	34.6	1.9	0.2	20
	AMME	*Amsinckia menziesii*	23.1	1.5	0.2	25
	SCBA	*Schismus barbatus*	19.2	1.4	2	20
	MAMA8	*Marah macrocarpus*	19.2	0.1	0.2	1
	CEME2	*Centaurea melitensis*	15.4	1.4	0.2	20
	HEFA	*Hemizonia fasciculata*	15.4	0.3	0.2	4

***Adenostoma fasciculatum-Xylococcus bicolor* Alliance (Chamise – Mission Manzanita)**

ASSOCIATIONS
Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus crassifolius
Adenostoma fasciculatum-Xylococcus bicolor-Quercus berberidifolia
Adenostoma fasciculatum-Xylococcus bicolor-Salvia mellifera-Malosma laurina

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum-Xylococcus bicolor* Shrubland form an intermittent to continuous shrub layer (36-82%, mean 69.5%), *Adenostoma fasciculatum* frequently co-dominates with *Xylococcus bicolor*, though sometimes *Xylococcus bicolor* is present as a sub-dominant. The shrub layer is often in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open (0.2-18%, mean 6.5%) at 0-2m tall, and relatively simple, including native and non-native species. *Eucalyptus* sp. is infrequently present at trace cover in the tree overstory. Total vegetation cover is 36-85% (mean 71.4%).

In the ***Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus crassifolius* Association,** *Ceanothus crassifolius* is consistently present as a co-dominant or sub-dominant shrub. *Malosma laurina* and *Salvia mellifera* often intermix as sub-dominant shrubs.

In the ***Adenostoma fasciculatum-Xylococcus bicolor-Quercus berberidifolia* Association,** *Quercus berberidifolia* co-dominates in the continuous shrub layer. Examples of shrub species that may intermix include *Artemisia californica* and *Malosma laurina*.

In the ***Adenostoma fasciculatum-Xylococcus bicolor-Salvia mellifera-Malosma laurina* Association,** *Salvia mellifera* is consistently sub-dominant in the shrub overstory, while *Malosma laurina*, *Quercus berberidifolia*, and *Gutierrezia sarothrae* are often sub-dominant.

Arctostaphylos rainbowensis, a CNPS List 1B species (CNPS 2005), was found in 3 of 13 surveys of the *Adenostoma fasciculatum-Xylococcus bicolor* Alliance. See Appendix 3 for more information on this plant.

Tetracoccus dioicus, a CNPS List 1B species (CNPS 2005), was found in 2 of 13 surveys of the *Adenostoma fasciculatum-Xylococcus bicolor* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 957-1,573 ft., mean 1,303 ft.
Aspect: all aspects (except flat)
Slope: moderate to steep, range 10-32 degrees, mean 21.5 degrees
Topography: variable, but more often convex and undulating, lower to top slopes
Litter Cover: range 16-92%, mean 52%
Rock Cover: range 1-67%, mean 24.7%
Bare ground: range 1-30%, mean 18.1%
Parent Material: more often sedimentary, less often gabbro and diorite or Mesozoic granite
Soil Texture: medium to very fine sandy loam, medium loam, moderately fine sandy clay loam to clay

The *Adenostoma fasciculatum-Xylococcus bicolor* Alliance only occurs Santa Ana Mountains (M262Bf) Subsection at lower elevations.

Samples used to describe alliance: (n=13) WRIV0281, WRIV0303, WRIV0304, WRIV0307, WRIV0315, WRIV0316, WRIV0401, WRIV0516, WRIV0621, WRIV0622, WRIV1001, WRIV1003, WRIV1004

RANK: G2 S2, G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: South Coast (including San Diego County coastal terraces and coastal hills) to the Peninsular Ranges (including Western Riverside: Santa Ana Mountains and San Diego County: western foothills)

Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus crassifolius Association: Peninsular Ranges (Western Riverside County: southern Santa Ana Mountains), though full distribution is not known
Adenostoma fasciculatum-Xylococcus bicolor-Quercus berberidifolia Association: Peninsular Ranges (Western Riverside County: southern Santa Ana Mountains), though full distribution is not known
Adenostoma fasciculatum-Xylococcus bicolor-Salvia mellifera-Malosma laurina Association: Peninsular Ranges (Western Riverside County: southern Santa Ana Mountains; San Diego County: western foothills), though full distribution is not known

REFERENCES
CNPS 2005, Evens and San In publication, Rivas-Martinez 1997, Unpublished CNPS transect data (1993-1995)

***Adenostoma fasciculatum-Xylococcus bicolor* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ADFA	*Adenostoma fasciculatum*	100	31.2	19	52
	XYBI	*Xylococcus bicolor*	100	19.4	2	48
	SAME3	*Salvia mellifera*	76.9	3	0.2	10
	MALA6	*Malosma laurina*	76.9	2.4	0.2	7
	CECR	*Ceanothus crassifolius*	61.5	9.4	1	36
	QUBE5	*Quercus berberidifolia*	46.2	4.7	0.2	30
	CEOL	*Ceanothus oliganthus*	30.8	1.3	0.2	12
	ERFA2	*Eriogonum fasciculatum*	30.8	0.2	0.2	1
	RHOV	*Rhus ovata*	23.1	0.6	0.2	4
	ARCA11	*Artemisia californica*	23.1	0.2	0.2	2
	ARRA7	*Arctostaphylos rainbowensis*	23.1	0	0.2	0.2
Herb	MAMA8	*Marah macrocarpus*	38.5	0.3	0.2	2
	CHAR	*Chaenactis artemisiifolia*	30.8	0.1	0.2	1
	CEME2	*Centaurea melitensis*	15.4	0	0.2	0.2
	PENST	*Penstemon*	15.4	0	0.2	0.2

***Adenostoma sparsifolium* Alliance (Redshank)**

ASSOCIATIONS
Adenostoma sparsifolium-Artemisia tridentata
Adenostoma sparsifolium-Ceanothus crassifolius
Adenostoma sparsifolium-Ceanothus cuneatus
Adenostoma sparsifolium-Ericameria linearifolia-Eriogonum fasciculatum-Opuntia basilaris
Adenostoma sparsifolium-Eriogonum fasciculatum-Lotus scoparius

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma sparsifolium* Shrubland form an open to intermittent shrub layer (14-63%, mean 36.7%), where *Adenostoma sparsifolium* dominates or co-dominates with other shrubs. The shrub layer is frequently in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open (1-33%, mean 14.1%) at 0-0.5m tall, including a mixture of native and non-native species across all five associations. Trees occur infrequently in the emergent layer (2% cover, mean 2%) at 5-10m tall. Total vegetation cover is 16-69% (mean 45.8%).

In the ***Adenostoma sparsifolium-Artemisia tridentata* Association,** *Artemisia tridentata* is co-dominant or sub-dominant with *Adenostoma sparsifolium*, and *Adenostoma fasciculatum* is characteristically present at sparse cover. *Gutierrezia sarothrae*, *Arctostaphylos pungens*, and *Eriogonum fasciculatum* are often present. *Bromus tectorum* is consistently present at low cover in the herb understory.

In the ***Adenostoma sparsifolium-Ceanothus crassifolius* Association,** *Ceanothus crassifolius* is consistently co-dominant or sub-dominant with *Adenostoma sparsifolium*, and *Salvia mellifera* is consistently sparse in cover.

In the ***Adenostoma sparsifolium-Ceanothus cuneatus* Association,** *Ceanothus cuneatus* is consistently co-dominant with *Adenostoma sparsifolium*, while *Cercocarpus betuloides*, *Garrya veatchii*, and *Lonicera subspicata* are consistently sub-dominant. *Eriogonum fasciculatum*, *Artemisia tridentata*, *Arctostaphylos pungens*, *Tetradymia comosa*, *Ceanothus leucodermis*, and *Prunus ilicifolia* are often present in the shrub layer at sparse cover.

In the ***Adenostoma sparsifolium-Ericameria linearifolia-Eriogonum fasciculatum-Opuntia basilaris* Association,** *Adenostoma sparsifolium* dominates in the shrub overstory, while *Ericameria linearifolia*, *Eriogonum fasciculatum*, *Rhus ovata*, *Quercus cornelius-mulleri*, *Yucca schidigera*, and *Opuntia basilaris* are characteristically present at low cover.

In the ***Adenostoma sparsifolium-Eriogonum fasciculatum-Lotus scoparius* Association,** *Adenostoma sparsifolium* is typically dominant, while *Eriogonum fasciculatum*, *Lotus scoparius* and *Rhus ovata* are characteristically sub-dominant or co-dominant. *Quercus agrifolia* infrequently occurs in the tree overstory at trace cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2,028-5,011 ft., mean 3,270 ft.
Aspect: all aspects
Slope: gentle to steep, range 1-31 degrees, mean 12.4 degrees
Topography: variable, but more often undulating, bottom to top slopes
Litter Cover: range 0-50%, mean 13.3%
Rock Cover: range 11-88%, mean 52.1%
Bare ground: range 0-71%, mean 28.4%
Parent Material: more often Mesozoic granite, less often mixed granitic and metamorphic, mixed metamorphic, alluvium
Soil Texture: more often medium to very fine sandy loam or coarse loamy sand, less often medium sand or moderately fine sandy clay loam

The *Adenostoma sparsifolium* Alliance was sampled mainly in the southeastern portion of the study area at variable elevations in the San Jacinto Foothills - Cahuilla Mountains (M262Bl), San Jacinto Mountains (M262Bm), and Palomar - Cuyamaca Peak, (M262Bo) Subsection.

Samples used to describe alliance: (n=18) WRAA.133, WRIV0023, WRIV0076, WRIV0081, WRIV0095, WRIV0096, WRIV0123, WRIV0129, WRIV0136, WRIV0591, WRIV0598, WRIV0612, WRIV0649, WRIV0652, WRIV0658, WRIV0716, WRIV0717, WRIV0925

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: southern outer Central Coast, outer low elevation Transverse Ranges (including Santa Monica Mountains), montane Peninsular Ranges (generally restricted to the San Jacinto Mountains, but also occurring sparsely in northern Peninsular Ranges)

Adenostoma sparsifolium-Artemisia tridentata Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains, San Jacinto Mountains, Palomar - Cuyamaca Peak Subsections), though full distribution is not known
Adenostoma sparsifolium-Ceanothus crassifolius Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains Subsection), though full distribution is not known
Adenostoma sparsifolium-Ceanothus cuneatus Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains and San Jacinto Mountains Subsections) though full distribution is not known
Adenostoma sparsifolium-Ericameria linearifolia-Eriogonum fasciculatum-Opuntia basilaris Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains Subsection), though full distribution is not known
Adenostoma sparsifolium-Eriogonum fasciculatum-Lotus scoparius Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains Subsection), though full distribution is not known

REFERENCES
Borchert et al. 2004, CDFG 1998, CNPS and CDFG 2005b, Gordon and White 1994, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Adenostoma sparsifolium* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ADSP	*Adenostoma sparsifolium*	100	19.7	7	48
	ERFA2	*Eriogonum fasciculatum*	77.8	3.1	0.2	15
	ADFA	*Adenostoma fasciculatum*	61.1	1.3	0.2	5
	RHOV	*Rhus ovata*	55.6	1	0.2	9
	LOSC2	*Lotus scoparius*	33.3	0.9	1	5
	ARTR2	*Artemisia tridentata*	27.8	1.4	0.2	14
	YUSC2	*Yucca schidigera*	27.8	0.3	0.2	2
	CECU	*Ceanothus cuneatus*	22.2	3.4	1	27
	CECR	*Ceanothus crassifolius*	22.2	1.9	0.2	15
	ARGL4	*Arctostaphylos glauca*	22.2	1	0.2	12
	ERLI6	*Ericameria linearifolia*	22.2	0.9	2	7
	SAME3	*Salvia mellifera*	22.2	0.8	1	10
	QUCO7	*Quercus cornelius-mulleri*	22.2	0.6	0.2	8
	ARPU5	*Arctostaphylos pungens*	22.2	0.2	0.2	2
	PRIL	*Prunus ilicifolia*	22.2	0.2	0.2	2
	GAVE2	*Garrya veatchii*	22.2	0.2	0.2	1
	OPBA2	*Opuntia basilaris*	22.2	0.1	0.2	1
	LOSU2	*Lonicera subspicata*	22.2	0	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	66.7	2.1	0.2	8
	BRTE	*Bromus tectorum*	22.2	1.7	0.2	18
	SACO6	*Salvia columbariae*	22.2	0.1	0.2	1
	MAMA8	*Marah macrocarpus*	16.7	0.2	1	2
Cryptogam	MOSS	Moss	16.7	0.4	1	4

***Adenostoma sparsifolium-Adenostoma fasciculatum* Alliance (Redshank – Chamise)**

ASSOCIATIONS
Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos glauca
Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos pungens
Adenostoma sparsifolium-Adenostoma fasciculatum-Ceanothus greggii
Adenostoma sparsifolium-Adenostoma fasciculatum-Opuntia parryi

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma sparsifolium-Adenostoma fasciculatum* Shrubland form an open to continuous shrub layer (23-91%, mean 50.7%), where the two species usually co-dominate. The shrub layer is often in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (0.2-50%, mean 7%) at 0-1m tall. Emergent trees occur infrequently (0.2-5% cover, mean 1.9%) at 5-20m tall, including *Pinus coulteri*, *Pinus quadrifolia* and *Quercus wislizeni*. Total vegetation cover is 26-91% (mean 54.3%).

In the ***Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos glauca* Association,** *Arctostaphylos glauca* is consistently present in the shrub overstory as a dominant, co-dominant, or sub-dominant. The most common sub-dominant shrubs are *Yucca whipplei* and *Eriogonum fasciculatum*.

In the ***Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos pungens* Association,** *Arctostaphylos pungens* is consistently present as a co-dominant or sub-dominant shrub species. A variety of other shrubs intermix at low cover, the most common being *Ceanothus cuneatus*, *Eriogonum fasciculatum*, and *Yucca schidigera*.

In the ***Adenostoma sparsifolium-Adenostoma fasciculatum-Ceanothus greggii* Association,** *Ceanothus greggii* consistently co-dominates or sub-dominates in the shrub overstory.

Similarly, in the ***Adenostoma sparsifolium-Adenostoma fasciculatum-Opuntia parryi* Association,** *Opuntia parryi* consistently co-dominates or sub-dominates in the shrub layer. *Eriogonum fasciculatum* is characteristically present at trace cover. A mixture of native and non-native species occurs in the herb layer in associations of the *Adenostoma sparsifolium-Adenostoma fasciculatum* Alliance (see species table).

Caulanthus simulans, a CNPS List 4 species (CNPS 2005), was found in 3 of 49 surveys of the *Adenostoma sparsifolium-Adenostoma fasciculatum* Alliance. See Appendix 3 for more information on this plant.

Mimulus diffusus, a CNPS List 4 species (CNPS 2005), was found in 2 of 49 surveys of the *Adenostoma sparsifolium-Adenostoma fasciculatum* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2,001-5,744 ft., mean 3,950 ft.
Aspect: all aspects (except flat)
Slope: gentle to steep, range 2-40 degrees, mean 16.5 degrees
Topography: variable, but more often undulating, bottom to top slopes
Litter Cover: range 0-85%, mean 25.2%
Rock Cover: range 6-91%, mean 46.0%
Bare ground: range 0-70%, mean 23.4%
Parent Material: more often Mesozoic granite, less often sedimentary, alluvium and other deposits, mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, but varies from coarse loamy sand to medium silt loam

The *Adenostoma sparsifolium-Adenostoma fasciculatum* Alliance was sampled mainly in the southeastern portion of the study area at variable elevations in the San Jacinto Foothills - Cahuilla

Mountains (M262Bl), San Jacinto Mountains (M262Bm), and Palomar - Cuyamaca Peak, (M262Bo) Subsection.

Samples used to describe alliance: (n=49) WRAA.077, WRAA.129, WRAA.138, WRAA.139, WRIV0024, WRIV0032, WRIV0044, WRIV0045, WRIV0050, WRIV0053, WRIV0054, WRIV0055, WRIV0057, WRIV0063, WRIV0066, WRIV0070, WRIV0072, WRIV0080, WRIV0083, WRIV0101, WRIV0124, WRIV0137, WRIV0154, WRIV0163, WRIV0167, WRIV0173, WRIV0203, WRIV0204, WRIV0576, WRIV0577, WRIV0611, WRIV0615, WRIV0661, WRIV0673, WRIV0679, WRIV0695, WRIV0706, WRIV0708, WRIV0732, WRIV0742, WRIV0746, WRIV0758, WRIV0761, WRIV0808, WRIV0826, WRIV0874, WRIV0915, WRIV0927, WRIV0929

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: southern outer Central Coast, outer low elevation Transverse Ranges (including Santa Monica Mountains), montane Peninsular Ranges (including San Jacinto Mountains)

Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos glauca Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains and San Jacinto Mountains Subsections), though full distribution is not known
Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos pungens Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains, San Jacinto Mountains, Palomar - Cuyamaca Peak Subsections), though full distribution is not known
Adenostoma sparsifolium-Adenostoma fasciculatum-Ceanothus greggii Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains, San Jacinto Mountains, Palomar - Cuyamaca Peak Subsections), though full distribution is not known
Adenostoma sparsifolium-Adenostoma fasciculatum-Opuntia parryi Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains Subsection), though full distribution is not known

REFERENCES
Borchert et al. 2004, CDFG 1998, CNPS 2005, CNPS and CDFG 2005b, Gordon and White 1994, Sawyer and Keeler-Wolf 1995

***Adenostoma sparsifolium-Adenostoma fasciculatum* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ADFA	*Adenostoma fasciculatum*	100	20.1	2	52
	ADSP	*Adenostoma sparsifolium*	100	14.2	0.2	40
	ARGL4	*Arctostaphylos glauca*	63.3	8.7	0.2	40
	YUWH	*Yucca whipplei*	51	0.2	0.2	1
	ERFA2	*Eriogonum fasciculatum*	49	0.8	0.2	8
	YUSC2	*Yucca schidigera*	26.5	0.1	0.2	3
	ARPU5	*Arctostaphylos pungens*	24.5	1.5	0.2	23
	LOSC2	*Lotus scoparius*	24.5	0.2	0.2	2
	CEGR	*Ceanothus greggii*	22.4	1.1	0.2	20
Herb	BRMA3	*Bromus madritensis*	34.7	1.5	0.2	35
	CRIN8	*Cryptantha intermedia*	22.4	0.6	0.2	6
	CAMIS	*Camissonia*	18.4	0.2	0.2	2
	BRTE	*Bromus tectorum*	16.3	0.5	0.2	12
	AMME	*Amsinckia menziesii*	16.3	0.2	0.2	4
Cryptogam	LICHEN	Lichen	26.5	1.1	1	8

***Adenostoma sparsifolium-Cercocarpus betuloides* Alliance (Redshank – Birchleaf Mountain-mahogany)**

ASSOCIATIONS
Adenostoma sparsifolium-Cercocarpus betuloides-Adenostoma fasciculatum

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma sparsifolium-Cercocarpus betuloides* Shrubland form an open to continuous shrub layer (24-80%, mean 48.7%), where *Adenostoma sparsifolium* generally dominates or co-dominates with *Cercocarpus betuloides*. Shrubs consistently occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to continuous (2-90%, mean 26%) at 0-1m tall. Emergent trees occur infrequently to occasionally (0.2-5% cover, mean 2.9%) at 5-20m tall. Total vegetation cover is 25-90% (mean 65.2%).

In the ***Adenostoma sparsifolium-Cercocarpus betuloides-Adenostoma fasciculatum* Association**, *Adenostoma sparsifolium* is frequently co-dominant with *Cercocarpus betuloides*, but occasionally either species may be sub-dominant to the other. *Adenostoma fasciculatum* is characteristically present at low cover, while a variety of mainly chaparral species may be present (e.g., *Eriogonum fasciculatum*, *Quercus berberidifolia*, *Ceanothus greggii*, *Arctostaphylos pungens*, *Ceanothus leucodermis*, *Prunus ilicifolia*, *Arctostaphylos pringlei*). *Pinus quadrifolia*, *Pinus coulteri*, and *Pinus jeffreyi* may be present as emergent trees at low cover. A wide variety of herb species may occupy the understory, the most common being non-native grass *Bromus tectorum* and native forbs *Cryptantha intermedia* and *Camissonia* spp.

Caulanthus simulans, a CNPS List 4 species (CNPS 2005), was found in 1 of 17 surveys of the *Adenostoma sparsifolium-Cercocarpus betuloides* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4,015-6,030 ft., mean 4,927 ft.
Aspect: all aspects, except flat
Slope: moderate to steep, range 8-30 degrees, mean 16.8 degrees
Topography: variable, but more often undulating, bottom to top slopes
Litter Cover: range 5-77%, mean 43.2%
Rock Cover: range 11-85%, mean 36.0%
Bare ground: range 1-55%, mean 18.7%
Parent Material: more often Mesozoic granite, less often sedimentary or mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, less often moderately coarse sandy loam or coarse loamy sand

The *Adenostoma sparsifolium-Cercocarpus betuloides* Alliance was sampled mainly in the southeastern portion of the study area at variable elevations in the San Jacinto Foothills - Cahuilla Mountains (M262Bl), San Jacinto Mountains (M262Bm), and Palomar - Cuyamaca Peak, (M262Bo) Subsection.

Samples used to describe alliance: (n=17) WRAA.075, WRAA.130, WRIV0069, WRIV0745, WRIV0750, WRIV0768, WRIV0773, WRIV0775, WRIV0782, WRIV0795, WRIV0796, WRIV0814, WRIV0906, WRIV0920, WRIV0923, WRIV0926, WRIV1024

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: southern outer Central Coast, outer low elevation Transverse Ranges, montane Peninsular Ranges (including San Jacinto Mountains), Baja CA.

Adenostoma sparsifolium-Cercocarpus betuloides-Adenostoma fasciculatum Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains, San Jacinto Mountains, Palomar - Cuyamaca Peak Subsections), though full distribution is not known

REFERENCES

CNPS 2005, Sawyer and Keeler-Wolf 1995

***Adenostoma sparsifolium-Cercocarpus betuloides* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PIQU	*Pinus quadrifolia*	29.4	1.4	0.2	10
Tree Understory	QUWI2-m	*Quercus wislizeni*	23.5	0.5	0.2	5
Shrub	ADSP	*Adenostoma sparsifolium*	100	26.7	2	65
	CEBE3	*Cercocarpus betuloides*	100	12.9	2	32
	ADFA	*Adenostoma fasciculatum*	82.4	2.8	0.2	13
	ERFA2	*Eriogonum fasciculatum*	52.9	1.1	0.2	7
	QUBE5	*Quercus berberidifolia*	47.1	1.7	0.2	16
	LOSU2	*Lonicera subspicata*	35.3	0.3	0.2	2
	CEGR	*Ceanothus greggii*	29.4	1.3	0.2	9
	ARPU5	*Arctostaphylos pungens*	29.4	0.8	1	6
	YUWH	*Yucca whipplei*	29.4	0.2	0.2	1
Herb	BRTE	*Bromus tectorum*	64.7	6.8	0.2	45
	CRIN8	*Cryptantha intermedia*	41.2	5.5	1	25
	CAMIS	*Camissonia*	41.2	0.6	0.2	3
	PHDI	*Phacelia distans*	23.5	4.5	3	30
	BRDI3	*Bromus diandrus*	17.6	3.6	0.2	58
	CLPA5	*Claytonia parviflora*	17.6	1.5	1	15
	CRYPT	*Cryptantha*	17.6	0.1	0.2	2

***Arctostaphylos glandulosa* Alliance (Eastwood Manzanita)**

ASSOCIATIONS
Arctostaphylos glandulosa
Arctostaphylos glandulosa-Arctostaphylos pringlei

LOCAL VEGETATION DESCRIPTION
Stands of *Arctostaphylos glandulosa* Shrubland form an intermittent to continuous shrub layer (45-92%, mean 72.6%) at 0.5-5m tall, where *Arctostaphylos glandulosa* usually dominates. The shrub layer occasionally occurs in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is open (2-3%, mean 2.5%) at 0-0.5m tall. Emergent trees often occur as a sparse layer (0.2-11% cover, mean 4.9%) at 5-20m tall, including *Pinus coulteri*, *Pinus jeffreyi*, *Quercus chrysolepis*, and *Quercus kelloggii*. Total vegetation cover is 45-92% (mean 74.8%).

In the ***Arctostaphylos glandulosa* Association,** *Arctostaphylos glandulosa* is the sole dominant shrub in the dense shrub overstory. *Adenostoma fasciculatum* is characteristically present as a sub-dominant shrub. Other chaparral shrubs occasionally intermix at sparse cover.

In the ***Arctostaphylos glandulosa-Arctostaphylos pringlei* Association,** *Arctostaphylos pringlei* and *Ceanothus leucodermis* are characteristically present in the shrub overstory and may be co-dominant or sub-dominant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3,996-6,233 ft., mean 5250 ft.
Aspect: variable
Slope: moderate to steep, range 10-40 degrees, mean 21.9 degrees
Topography: variable, but more often undulating, mid to upper slopes
Litter Cover: range 10-82%, mean 51.5%
Rock Cover: range 13-73%, mean 29.7%
Bare ground: range 0-70%, mean 14.1%
Parent Material: more often Mesozoic granite, less often mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, less often coarse loamy sand or moderately coarse sandy loam

The *Arctostaphylos glandulosa* Alliance was sampled in the middle montane elevations of the Santa Ana Mountains (M262Bf) and San Jacinto Mountains (M262Bm) Subsections.

Samples used to describe alliance: (n=10) WRIV0245, WRIV0332, WRIV0338, WRIV0701, WRIV0721, WRIV0780, WRIV0787, WRIV0869, WRIV0894, WRIV0907

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: outer North and Central Coasts (from the Klamath Mountains to San Diego County), montane Transverse Ranges (including Santa Monica Mountains), montane Peninsular Ranges (including Santa Ana Mountains and San Jacinto Mountains), Anza-Borrego Desert

Arctostaphylos glandulosa Association: Peninsular Ranges (Western Riverside County: Santa Ana and San Jacinto Subsections), western Transverse Ranges (including Santa Monica Mountains), though full distribution is not known
Arctostaphylos glandulosa-Arctostaphylos pringlei Association: Peninsular Ranges (Western Riverside County: San Jacinto Subsections), though full distribution is not known

REFERENCES
Borchert 2004, CDFG 1998, CNPS and CDFG 2005b, Gordon and White 1994, NatureServe et al. 2003a, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Arctostaphylos glandulosa* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PICO3-t	*Pinus coulteri*	50	2.4	0.2	10
	PIJE-t	*Pinus jeffreyi*	20	0.1	0.2	1
Tree Understory	QUWI2-m	*Quercus wislizeni*	70	5.4	0.2	40
Shrub	ARGL3	*Arctostaphylos glandulosa*	100	57.9	33	82
	ADFA	*Adenostoma fasciculatum*	90	4	1	12
	YUWH	*Yucca whipplei*	40	0.1	0.2	0.2
	ARPR	*Arctostaphylos pringlei*	30	3.2	1	24
	CELE2	*Ceanothus leucodermis*	30	2.6	1	18
	CEBE3	*Cercocarpus betuloides*	20	0	0.2	0.2
Herb	CRMU2	*Cryptantha muricata*	20	0.1	0.2	1

***Artemisia californica* Alliance (California Sagebrush)**

ASSOCIATIONS
Artemisia californica/Amsinckia menziesii
Artemisia californica-Malosma laurina

LOCAL VEGETATION DESCRIPTION
Stands of *Artemisia californica* Shrubland form an open to intermittent shrub layer (3-60%, mean 34%), where *Artemisia californica* dominates or sometimes co-dominates. The shrub layer is often in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to continuous (2-70%, mean 30.3%) at 0-2m tall, with a variety of native and non-native species in the understory. Total vegetation cover is 33-88% (mean 58.5%).

In the ***Artemisia californicalAmsinckia menziesii* Association,** *Eriogonum fasciculatum* is often present in the shrub layer. *Salvia apiana*, *Tetradymia comosa*, *Sambucus mexicana*, *Encelia farinosa*, *and Mimulus aurantiacus* are occasionally present. *Amsinckia menziesii* is consistently present in the herb understory at low to moderate cover and sometimes has equal or higher cover than the total shrub cover.

In the ***Artemisia californica-Malosma laurina* Association,** *Malosma laurina* is consistently present as a co-dominant or sub-dominant shrub. Shrubs *Salvia apiana* and *Eriogonum fasciculatum* are often present at low cover.

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 1 of 22 surveys of the *Artemisia californica* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,161-2,442 ft., mean 1,854 ft.
Aspect: variable, but more often NE and NW
Slope: gentle to steep, range 1-42 degrees, mean 23.2 degrees
Topography: variable, but more often undulating, bottom to top slopes
Litter Cover: range 4-65%, mean 29.2%
Rock Cover: range 5-70%, mean 27.3%
Bare ground: range 9-77%, mean 31.2%
Parent Material: more often Mesozoic granite or sedimentary and alluvium, less often metavolcanic or mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, but varies from coarse loamy sand to moderately fine sandy clay loam

The *Artemisia californica* Alliance was sampled in the Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections.

Samples used to describe alliance: (n=22) WRAA.006, WRAA.051, WRAA.060, WRAA.063, WRIV0213, WRIV0214, WRIV0347, WRIV0404, WRIV0407, WRIV0409, WRIV0410, WRIV0412, WRIV0413, WRIV0414, WRIV0415, WRIV0416, WRIV0468, WRIV0494, WRIV0538, WRIV0573, WRIV0629, WRIV0640

RANK: G1 S1, G2 S2, G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Central and South Coasts (including Marin to Western Riverside and San Diego Counties), Transverse and Peninsular Ranges (Santa Monica Mountains and sparsely in the southern San Bernardino, San Gabriel, and Santa Ana and interior Palomar Mountains/hills north of Ramona in San Diego County), Channel Islands, Baja California

Artemisia californica/*Amsinckia menziesii* Association: South Coast (including Ventura to Western Riverside and San Diego Counties) and Peninsular Ranges (including San Diego County: southwest and east of Escondido and hills north of Ramona)
Artemisia californica-Malosma laurina Association: South Coast (from Ventura to San Diego County), Peninsular Ranges (including Western Riverside County: Santa Ana Mountains; San Diego County: coastal hills and western foothills)

REFERENCES
Borchert et al. 2004, CNPS 2005, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San 2004, Evens and San In publication, Gordon and White 1994, Hanes 1976, Keeler-Wolf 1990, Kirkpatrick & Hutchinson 1977, Minnich 1976, NatureServe et al. 2003a, O'Leary 1989, Sawyer and Keeler-Wolf 1995, Vogl 1976, White 1994

***Artemisia californica* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ARCA11	*Artemisia californica*	100	19.5	1	41
	ERFA2	*Eriogonum fasciculatum*	59.1	1.5	0.2	9
	SAAP2	*Salvia apiana*	50	1.7	0.2	12
	MALA6	*Malosma laurina*	27.3	3	3	20
	RHIL	*Rhamnus ilicifolia*	27.3	0.6	0.2	6
	TECO2	*Tetradymia comosa*	22.7	0.4	0.2	4
	MIAU	*Mimulus aurantiacus*	22.7	0.3	0.2	6
	SAME5	*Sambucus mexicana*	22.7	0.2	0.2	3
	SAME3	*Salvia mellifera*	22.7	0.2	0.2	2
	ENFA	*Encelia farinosa*	22.7	0.1	0.2	1
Herb	AMME	*Amsinckia menziesii*	68.2	7.5	2	40
	HIIN3	*Hirschfeldia incana*	45.5	1.9	0.2	20
	ARDR4	*Artemisia dracunculus*	40.9	3.5	0.2	54
	BRMA3	*Bromus madritensis*	40.9	2.8	2	14
	MAMA8	*Marah macrocarpus*	27.3	0.4	0.2	7
	MICA6	*Mirabilis californica*	27.3	0.3	0.2	5
	ERODI	*Erodium*	22.7	4.7	5	65
	ERCI6	*Erodium cicutarium*	22.7	1.2	0.2	14
	SCBA	*Schismus barbatus*	18.2	0.9	3	6
	NEME	*Nemophila menziesii*	18.2	0.2	0.2	2
	LEFI11	*Lessingia filaginifolia*	18.2	0.1	0.2	1
Cryptogam	LICHEN	Lichen	18.2	0.6	2	5
	MOSS	Moss	18.2	0.4	0.2	3

***Artemisia californica-Eriogonum fasciculatum* Alliance (California Sagebrush – California Buckwheat)**

ASSOCIATIONS
Artemisia californica-Eriogonum fasciculatum
Artemisia californica-Eriogonum fasciculatum-Malosma laurina
Artemisia californica-Eriogonum fasciculatum-Salvia apiana

LOCAL VEGETATION DESCRIPTION
Stands of *Artemisia californica-Eriogonum fasciculatum* Shrubland form an open to continuous shrub layer (22-78%, mean 45.8%), where *Artemisia californica* usually co-dominates with *Eriogonum fasciculatum*. Shrubs sometimes occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (0.2-60%, mean 19.9%) at 0-1m tall and includes a variety of native and non-native species. Emergent trees occur infrequently (0.2-8% cover, mean 4.1%) at 5-15m tall. Total vegetation cover is 26-88% (mean 60.6%).

In the ***Artemisia californica-Eriogonum fasciculatum* Association,** occasional sub-dominant shrubs include *Salvia apiana*, *Lotus scoparius*, *Tetradymia comosa*, and *Lessingia filaginifolia*. The most common annuals in the herb understory include native *Amsinckia menziesii* and non-natives *Bromus madritensis*, *Bromus diandrus*, *Bromus hordeaceus*, and *Avena fatua*.

In the ***Artemisia californica-Eriogonum fasciculatum-Malosma laurina* Association,** *Malosma laurina* and *Salvia mellifera* are consistently present as sub-dominant shrubs. Other shrubs that occur occasionally include *Salvia apiana* and *Heteromeles arbutifolia*.

In the ***Artemisia californica-Eriogonum fasciculatum-Salvia apiana* Association,** all three shrub species are consistently present and *Salvia apiana* is usually sub-dominant. *Platanus racemosa* is infrequently present as on overstory tree at trace cover.

Romneya coulteri, a CNPS List 4 species (CNPS 2005), was found in 1 of 38 surveys of the *Artemisia californica-Eriogonum fasciculatum* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,063-3,637 ft., mean 1,810 ft.
Aspect: more often NW and NE, but can be found on all aspects
Slope: gentle to steep, range 2-40 degrees, mean 22.5 degrees
Topography: variable, but more often undulating, bottom to top slopes
Litter Cover: range 0-88%, mean 37.5%
Rock Cover: range 1-50%, mean 22.8%
Bare ground: range 7-76%, mean 36.1%
Parent Material: more often sedimentary or Mesozoic granite, less often gabbro and diorite, metavolcanic, mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, but varies from medium sand to moderately fine sandy clay loam

The *Artemisia californica-Eriogonum fasciculatum* has been frequently sampled at lower elevations in the study area in well-drained soils, particularly within the Santa Ana Mountains (M262Bf), Fontana Plain - Calimesa Terraces (M262Bj, Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections.

Samples used to describe alliance: (n=38) WRAA.028, WRAA.032, WRAA.035, WRAA.054, WRAA.055, WRAA.059, WRAA.067, WRAA.106, WRAA.107, WRAA.113, WRAA.123, WRAA.127, WRAA.143, WRAA.150, WRAA.163, WRAA.165, WRIV0003, WRIV0005, WRIV0131, WRIV0246, WRIV0294, WRIV0305, WRIV0357, WRIV0367, WRIV0370, WRIV0375, WRIV0382, WRIV0449, WRIV0456, WRIV0463, WRIV0515, WRIV0585, WRIV0603, WRIV0689, WRIV0938, WRIV0942, WRIV0954, WRIV0961

RANK: G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Central Coast (including San Benito County), inner South Coast, montane Transverse and Peninsular Ranges (including Santa Ana Mountains and Western Riverside County), Baja California

Artemisia californica-Eriogonum fasciculatum Association: South Coast (including Ventura to Western Riverside and San Diego Counties), Peninsular Ranges (Western Riverside County: Santa Ana Mountains, Perris Valley and Hills, Fontana Plain; San Diego County: hills north of Ramona)
Artemisia californica-Eriogonum fasciculatum-Malosma laurina Association: South Coast (San Diego County), Peninsular Ranges (Western Riverside County: Santa Ana Mountains; San Diego County: coastal and low hills north and east of Ramona)
Artemisia californica-Eriogonum fasciculatum-Salvia apiana Association: South Coast (Western Riverside County: Perris Valley and Hills and Santa Ana Mountains Subsections)

REFERENCES
Boyd et al. 1995, CNPS 2005, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San In publication, Gordon and White 1994, Sawyer and Keeler-Wolf 1995, White 1994

***Artemisia californica-Eriogonum fasciculatum* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ARCA11	*Artemisia californica*	100	22.5	5	60
	ERFA2	*Eriogonum fasciculatum*	100	14.3	1	41
	SAAP2	*Salvia apiana*	71.1	5.9	0.2	27
	MALA6	*Malosma laurina*	28.9	2.1	0.2	18
	SAME3	*Salvia mellifera*	28.9	1.1	0.2	12
	YUWH	*Yucca whipplei*	23.7	0.2	0.2	1
	KEAN	*Keckiella antirrhinoides*	21.1	0.5	0.2	8
Herb	BRMA3	*Bromus madritensis*	65.8	4.1	0.2	25
	HIIN3	*Hirschfeldia incana*	34.2	2.1	1	22
	BRDI3	*Bromus diandrus*	23.7	1	0.2	8
	CEME2	*Centaurea melitensis*	21.1	1.1	0.2	21
	HEFA	*Hemizonia fasciculata*	15.8	0.5	0.2	10
	BRHO2	*Bromus hordeaceus*	15.8	0.2	1	3

***Artemisia californica-Salvia apiana* Alliance (California Sagebrush – White Sage)**

ASSOCIATIONS
Artemisia californica-Salvia apiana

LOCAL VEGETATION DESCRIPTION
Stands of *Artemisia californica-Salvia apiana* Shrubland form an intermittent to continuous shrub layer (33-75%, mean 49.2%), where both species frequently co-dominate. The shrub layer is often in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (1-60%, mean 22.3%) at 0-1m tall. Emergent trees occur infrequently (1% cover, mean 1%) at 5-10m tall. Total vegetation cover is 40-90% (mean 63.8%).

In the ***Artemisia californica-Salvia apiana* Association**, *Artemisia californica* and *Salvia apiana* are consistently present as overstory shrubs and typically co-dominate. Various chaparral and coastal sage species intermix in the shrub layer as sub-dominants, including characteristically present *Malosma laurina* and often present *Eriogonum fasciculatum*. *Quercus agrifolia* occurs infrequently in the overstory tree layer at trace cover. A variety of native and non-native herb species occupy the understory in this association (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 872-2,315 ft., mean 1,314 ft.
Aspect: variable, but more often SE
Slope: gentle to steep, range 5-30 degrees, mean 22 degrees
Topography: variable, but more often undulating bottom to top slopes
Litter Cover: range 1-65%, mean 34%
Rock Cover: range 3-40%, mean 17.7%
Bare ground: range 6-58%, mean 34.5%
Parent Material: more often sedimentary, less often Mesozoic granite or gabbro and diorite
Soil Texture: varies from coarse loamy sand to moderately fine sandy clay loam

The *Artemisia californica-Salvia apiana* Alliance was sampled only within the Santa Ana Mountains (M262Bf) Subsection at lower elevations.

Samples used to describe alliance: (n=13) WRAA.167, WRAA.169, WRIV0273, WRIV0280, WRIV0306, WRIV0317, WRIV0398, WRIV0501, WRIV0518, WRIV0524, WRIV0620, WRIV0623, WRIV0624

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: South Coast (including San Diego County) to Peninsular Ranges (including Western Riverside County)

Artemisia californica-Salvia apiana Association: Peninsular Ranges (including Western Riverside County: Santa Ana Mountains; San Diego County: coastal and low hills north and west of Ramona)

REFERENCES
Evens and San In publication, Gordon and White 1994

***Artemisia californica-Salvia apiana* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ARCA11	*Artemisia californica*	100	27.2	15	55
	SAAP2	*Salvia apiana*	100	17.8	6	27
	MALA6	*Malosma laurina*	92.3	2.6	0.2	7
	ERFA2	*Eriogonum fasciculatum*	69.2	1.3	0.2	4
	SAME3	*Salvia mellifera*	38.5	0.9	0.2	5
	YUWH	*Yucca whipplei*	38.5	0.5	0.2	4
	HASQ2	*Hazardia squarrosa*	23.1	0.2	0.2	1
	ADFA	*Adenostoma fasciculatum*	23.1	0	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	46.2	4.8	0.2	30
	HIIN3	*Hirschfeldia incana*	46.2	4.3	2	20
	CEME2	*Centaurea melitensis*	46.2	2.8	1	22
	MICA6	*Mirabilis californica*	30.8	0.8	1	5
	PTDR	*Pterostegia drymarioides*	23.1	2.5	5	17
	ERCI6	*Erodium cicutarium*	23.1	2.3	0.2	20
	CRYPT	*Cryptantha*	23.1	1.2	0.2	13
	PSTE	*Psilocarphus tenellus*	15.4	0.6	3	5
	NAPU4	*Nassella pulchra*	15.4	0.5	1	5
	MAMA8	*Marah macrocarpus*	15.4	0.3	2	2
	PLER3	*Plantago erecta*	15.4	0.2	0.2	3
	ACCO21	*Achnatherum coronatum*	15.4	0.2	0.2	2
	DICA14	*Dichelostemma capitatum*	15.4	0.1	0.2	1

***Artemisia californica-Salvia mellifera* Alliance (California Sagebrush – Black Sage)**

ASSOCIATIONS
Artemisia californica-Salvia mellifera

LOCAL VEGETATION DESCRIPTION
Stands of *Artemisia californica-Salvia mellifera* Shrubland form an intermittent to continuous shrub layer (55-69%, mean 61.1%), where both species co-dominate. The shrub layer is often in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (1-39%, mean 15.4%) at 0-1m tall. Total vegetation cover is 61-85% (mean 71.6%).

In the ***Artemisia californica-Salvia mellifera* Association,** *Artemisia californica* and *Salvia mellifera* co-dominate. A variety of chaparral and coastal sage shrubs may intermix in the shrub layer at lower cover, including often present *Adenostoma fasciculatum*. Native and non-native annual herbs occupy the herb understory (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 705-2,322 ft., mean 1,601 ft.
Aspect: all aspects (except flat)
Slope: gentle to steep, range 2-40 degrees, mean 20.7 degrees
Topography: more often undulating, less often flat, bottom to top slopes
Litter Cover: range 10-72%, mean 32.8%
Rock Cover: range 0-45%, mean 23%
Bare ground: range 15-70%, mean 37%
Parent Material: more often sedimentary, less often Mesozoic granite or gabbro and diorite
Soil Texture: varies from medium sandy loam to moderately fine silty clay loam

The *Artemisia californica-Salvia mellifera* Alliance was sampled in the Santa Ana Mountains (M262Bf) and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections.

Samples used to describe alliance: (n=7) WRIV0010, WRIV0272, WRIV0473, WRIV0508, WRIV0509, WRIV0520, WRIV0522

RANK: G2 S2, G3 S3

GLOBAL DISTRIBUTION
Alliance: Central Coast (including Santa Clara and San Benito Counties), Transverse and Peninsular Ranges (including Santa Ana Mountains and San Jacinto Foothills), southern California along the Coast Ranges, northward along the coast

Artemisia californica-Salvia mellifera Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains and San Jacinto Foothills – Cahuilla Mountains Subsections), though full distribution is not known

REFERENCES
CNPS and CDFG 2005a, Desimone and Burk 1992, Evens and San 2004, Gordon and White 1994, Sawyer and Keeler-Wolf 1995

***Artemisia californica-Salvia mellifera* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	SAME3	*Salvia mellifera*	100	25.4	15	50
	ARCA11	*Artemisia californica*	100	24.3	10	40
	ADFA	*Adenostoma fasciculatum*	71.4	0.7	0.2	3
	MALA6	*Malosma laurina*	42.9	1.6	2	5
	ERFA2	*Eriogonum fasciculatum*	42.9	1.5	0.2	8
	CECR	*Ceanothus crassifolius*	42.9	0.5	0.2	2
	QUBE5	*Quercus berberidifolia*	28.6	0.6	1	3
	RHOV	*Rhus ovata*	28.6	0.2	0.2	1
	YUWH	*Yucca whipplei*	28.6	0.1	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	71.4	5.1	1	18
	EUCH	*Eucrypta chrysanthemifolia*	57.1	3.6	0.2	19
	HIIN3	*Hirschfeldia incana*	57.1	0.5	0.2	1
	MAMA8	*Marah macrocarpus*	42.9	0.3	0.2	2
	AMME	*Amsinckia menziesii*	28.6	1.3	1	8

***Artemisia tridentata* Alliance (Big Sagebrush)**

ASSOCIATIONS
Artemisia tridentata
Artemisia tridentata-Eriogonum fasciculatum
Artemisia tridentata-Eriogonum wrightii

LOCAL VEGETATION DESCRIPTION
Stands of *Artemisia tridentata* Shrubland form an open to intermittent shrub layer (13-52%, mean 35%), where *Artemisia tridentata* dominates or co-dominates with subshrubs. The shrub layer is often in two different strata, with low shrubs at 0-2m tall and tall shrubs at 0.5-5m tall. The herbaceous layer is open to intermittent (1-45%, mean 12.0%) at 0-0.5m tall and includes a variety of native and non-native species (see species table).. Emergent trees occur infrequently at sparse cover (1-4%, mean 2.1%) at 5-20m tall, including *Quercus wislizeni*, *Salix laevigata*, *Quercus agrifolia*, and *Pinus jeffreyi*. Total vegetation cover is 30-65% (mean 43.6%).

In the ***Artemisia tridentata* Association,** *Artemisia tridentata* is the sole dominant shrub. A variety of other shrub species intermix at low cover, the most common being *Ceanothus cuneatus*, *Gutierrezia sarothrae*, and *Eriogonum fasciculatum*. *Bromus tectorum* is consistently present in the herb understory at variable cover.

In the ***Artemisia tridentata-Eriogonum fasciculatum* Association,** *Eriogonum fasciculatum* is frequently sub-dominant in the shrub layer, but may be co-dominant. *Ericameria pinifolia* and *Sambucus mexicana* are often present at sparse cover.

In the ***Artemisia tridentata/Eriogonum wrightii* Association,** *Eriogonum wrightii* is characteristically present as a co-dominant or sub-dominant shrub. *Ceanothus leucodermis*, *Eriogonum fasciculatum*, *Gutierrezia sarothrae*, and *Garrya flavescens* are examples of shrub species that may be present at sparse cover.

Abronia villosa var. *aurita*, a CNPS List 1B species (CNPS 2005), was found in 1 of 23 surveys of the *Artemisia tridentata* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,525-4,865 ft., mean 3,830 ft.
Aspect: all aspects
Slope: flat to moderate, range 0-12 degrees, mean 3.9 degrees
Topography: variable, but more often flat, bottom to mid slopes
Litter Cover: range 0-35%, mean 8.8%
Rock Cover: range 4-87%, mean 44.7%
Bare ground: range 0-80%, mean 35.2%
Parent Material: more often Mesozoic granite or alluvium, less often sedimentary or mixed granitic and metamorphic
Soil Texture: more often coarse loamy sand or medium to very fine sandy loam, less often moderately coarse sandy loam to medium silt loam

The *Artemisia tridentata* Alliance was sampled in the Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl), and San Jacinto Mountains (M262Bm) Subsections in drier, colder sub-regions of the study area.

Samples used to describe alliance: (n=23) WRIV0039, WRIV0040, WRIV0042, WRIV0049, WRIV0051, WRIV0065, WRIV0067, WRIV0071, WRIV0073, WRIV0075, WRIV0079, WRIV0132, WRIV0142, WRIV0153, WRIV0156, WRIV0677, WRIV0678, WRIV0697, WRIV0704, WRIV0744, WRIV0754, WRIV0931, WRIV0933

RANK: G5 S5 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: inner Central and South Coasts, San Joaquin Valley, montane and subalpine Cascade Ranges, montane and subalpine Sierra Nevada, Transverse Ranges, Peninsular Ranges (including southeastern Western Riverside County), Great Basin, Mojave Desert, intermountain West, Baja CA

Artemisia tridentata Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills – Cahuilla Mountains Subsection), though full distribution is not known
Artemisia tridentata-Eriogonum fasciculatum Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills – Cahuilla Mountains and San Jacinto Mountains Subsections), though full distribution is not known
Artemisia tridentata-Eriogonum wrightii Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills – Cahuilla Mountains Subsection), though full distribution is not known

REFERENCES
CNPS 2005, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004

***Artemisia tridentata* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ARTR2	*Artemisia tridentata*	100	21.5	8	41
	ERFA2	*Eriogonum fasciculatum*	65.2	4.4	0.2	20
	GUSA2	*Gutierrezia sarothrae*	39.1	1	0.2	9
	SAME5	*Sambucus mexicana*	39.1	0.5	0.2	3
	ERPI7	*Ericameria pinifolia*	30.4	1.4	1	10
	CECU	*Ceanothus cuneatus*	30.4	1.1	0.2	10
	ADSP	*Adenostoma sparsifolium*	30.4	0.3	0.2	5
	ADFA	*Adenostoma fasciculatum*	26.1	0.5	0.2	6
	QUBE5	*Quercus berberidifolia*	21.7	0.7	0.2	10
	OPPA2	*Opuntia parryi*	21.7	0.2	0.2	4
Herb	BRTE	*Bromus tectorum*	69.6	4.2	0.2	18
	BRMA3	*Bromus madritensis*	39.1	2.4	1	28
	HIIN3	*Hirschfeldia incana*	26.1	0.4	0.2	5
	ARDR4	*Artemisia dracunculus*	21.7	0.1	0.2	1

***Baccharis salicifolia* Alliance (Mulefat)**

ASSOCIATIONS
Baccharis salicifolia-Sambucus mexicana

LOCAL VEGETATION DESCRIPTION
Stands of *Baccharis salicifolia* Shrubland form an intermittent shrub layer (40-65%, mean 53.7%) at 1-5m tall, where *Baccharis salicifolia* usually dominates. The herbaceous layer is open to intermittent (15-50%, mean 30%) at 0-0.5m tall. Emergent trees occur frequently (4-23% cover, mean 13.5%) at 10-15m tall. Total vegetation cover is 70-80% (mean 75%).

In the ***Baccharis salicifolia-Sambucus mexicana* Association,** *Baccharis salicifolia* is either dominant or co-dominant with *Sambucus mexicana*, which is characteristic in the shrub overstory. *Salix laevigata* and *Populus fremontii* may be present at trace cover as emergent trees. Other common species include non-native shrub *Nicotiana glauca* and non-native herbs *Bromus diandrus*, *Bromus madritensis*, and *Hirschfeldia incana*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,062-3,622 ft., mean 2,173 ft.
Aspect: SW and SE
Slope: gentle, range 1-5 degrees, mean 2.7 degrees
Topography: flat or concave, bottom slopes
Litter Cover: range 45-50%, mean 48.3%
Rock Cover: range 5-20%, mean 13.3%
Bare ground: range 25-45%, mean 36.7%
Parent Material: alluvium, sedimentary, Mesozoic granite
Soil Texture: medium sand, medium to very fine sandy loam, moderately fine sandy clay loam

The *Baccharis salicifolia* Alliance was sampled in the San Gorgonio Mountains (M262Bg), Perris Valley and Hills (M262Bk), and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections in low-sloping, intermittently flooded riparian corridors at low to mid elevations.

Samples used to describe alliance: (n=3) WRIV0462, WRIV0569, WRIV0967

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: inner North Coast, Central and South Coast (including San Benito County), Central Valley, Klamath foothills, Cascade Range foothills, lower montane Sierra Nevada, montane Transverse and Peninsular Ranges (including Western Riverside and San Diego Counties), Mojave Desert, Colorado Desert, Anza-Borrego Desert

Baccharis salicifolia-Sambucus mexicana Association: South Coast and Peninsular Ranges (Western Riverside County: San Gorgonio Mountains, Perris Valley and Hills, and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known

REFERENCES
Boyd et al. 1995, CDFG 1998, CNPS and CDFG 2005a, Evens and San In publication, Potter 2003, Sawyer and Keeler-Wolf 1995

***Baccharis salicifolia* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	SALA3-t	*Salix laevigata*	66.7	2	2	4
	POFR2-t	*Populus fremontii*	33.3	0.1	0.2	0.2
Tree Understory	QUWI2-m	*Quercus wislizeni*	33.3	0.3	1	1
Shrub	BASA4	*Baccharis salicifolia*	100	48.3	30	60
	SAME5	*Sambucus mexicana*	100	9.7	1	26
	NIGL	*Nicotiana glauca*	66.7	1.3	1	3
	BAEM	*Baccharis emoryi*	33.3	1.7	5	5
	SALA6-m	*Salix lasiolepis*	33.3	1.3	4	4
	ARCA11	*Artemisia californica*	33.3	0.1	0.2	0.2
	MAFA	*Malacothamnus fasciculatus*	33.3	0.1	0.2	0.2
Herb	BRDI3	*Bromus diandrus*	66.7	13.3	10	30
	BRMA3	*Bromus madritensis*	66.7	7.3	10	12
	HIIN3	*Hirschfeldia incana*	66.7	2.7	3	5
	HOMU	*Hordeum murinum*	33.3	6.7	20	20
	BRTE	*Bromus tectorum*	33.3	0.7	2	2
	EUCH	*Eucrypta chrysanthemifolia*	33.3	0.7	2	2
	LAAU	*Lamarckia aurea*	33.3	0.7	2	2
	MAPA5	*Malva parviflora*	33.3	0.7	2	2
	AMME	*Amsinckia menziesii*	33.3	0.3	1	1
	ERCI6	*Erodium cicutarium*	33.3	0.3	1	1
	LEFI11	*Lessingia filaginifolia*	33.3	0.1	0.2	0.2
	URDI	*Urtica dioica*	33.3	0.1	0.2	0.2

***Ceanothus crassifolius* Alliance (Hoaryleaf Ceanothus)**

ASSOCIATIONS
Ceanothus crassifolius-Adenostoma fasciculatum-Xylococcus bicolor
Ceanothus crassifolius-Cercocarpus betuloides
Ceanothus crassifolius -Malosma laurina

LOCAL VEGETATION DESCRIPTION
Stands of *Ceanothus crassifolius* Shrubland form an open to consistent shrub layer (27-88%, mean 66.4%), where *Ceanothus crassifolius* usually dominates. The shrub layer is frequently in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The tree layer is extremely sparse (0-0.2%, mean 0%), at 5-10m tall, with *Quercus agrifolia* infrequently occurring at trace cover. The herbaceous layer is open to intermittent (0.2-60%, mean 12.3%) at 0-1m tall and consists of a mixture of native and non-native species (see species table). Total vegetation cover is 32-89% (mean 72.1%).

In the ***Ceanothus crassifolius-Adenostoma fasciculatum-Xylococcus bicolor* Association,** *Xylococcus bicolor* is consistently co-dominant or sub-dominant in the shrub layer, while *Adenostoma fasciculatum* and *Malosma laurina* are consistently sub-dominant. Shrubs *Quercus berberidifolia*, *Salvia mellifera*, *Ceanothus oliganthus*, *Eriogonum fasciculatum* often intermix at low cover.

In the ***Ceanothus crassifolius-Cercocarpus betuloides* Association,** *Cercocarpus betuloides* is consistently co-dominant or sub-dominant while *Adenostoma fasciculatum* and *Malosma laurina* are consistently sub-dominant. Shrubs *Salvia mellifera*, *Heteromeles arbutifolia*, and *Rhamnus ilicifolia* are characteristically present at sparse cover.

In the ***Ceanothus crassifolius-Malosma laurina* Association,** *Ceanothus crassifolius* dominates in the shrub layer while *Malosma laurina* and *Adenostoma fasciculatum* are sub-dominant to co-dominant. *Salvia mellifera* and *Heteromeles arbutifolia* are characteristically present at low cover.

Romneya coulteri, a CNPS List 4 species (CNPS 2005), was found in 1 of 23 surveys of the *Ceanothus crassifolius* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 756-2,952 ft., mean 1,741 ft.
Aspect: all aspects (except flat)
Slope: moderate to steep, range 12-45 degrees, mean 29.1 degrees
Topography: undulating or convex, lower to top slopes
Litter Cover: range 4-90%, mean 52.4%
Rock Cover: range 1-45%, mean 19.6%
Bare ground: range 2-85%, mean 24.3%
Parent Material: more often metavolcanic, less often gabbro and diorite, sedimentary, Mesozoic granite
Soil Texture: often medium to very fine sandy loam, but varies from coarse loamy sand to moderately fine silty clay loam

The *Ceanothus crassifolius* Alliance was sampled consistently at lower elevation slopes in the Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections.

Samples used to describe alliance: (n=23) WRAA.041, WRAA.043, WRAA.044, WRAA.046, WRAA.048, WRAA.050, WRIV0265, WRIV0286, WRIV0296, WRIV0308, WRIV0314, WRIV0385, WRIV0386, WRIV0393, WRIV0394, WRIV0403, WRIV0475, WRIV0477, WRIV0513, WRIV0517, WRIV0526, WRIV0544, WRIV0558

RANK: G3 S3 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: south Central Coast (including Los Padres National Forest), inner South Coast (including Western Riverside County: Perris Valley and Hills), Transverse and Peninsular Ranges (including Santa Monica, Santa Ana, San Jacinto, San Gabriel, and San Bernardino Mountains), Baja California

Ceanothus crassifolius-Adenostoma fasciculatum-Xylococcus bicolor Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains; San Diego County: western foothills)
Ceanothus crassifolius-Cercocarpus betuloides Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains), though full distribution is not known
Ceanothus crassifolius -Malosma laurina Association: western Transverse Ranges (Santa Monica Mountains), Peninsular Ranges (Western Riverside County: Santa Ana Mountains), though full distribution is not known

REFERENCES
Borchert et al. 2004, Boyd et al. 1995, CNPS 2005, CNPS and CDFG 2005b, Evens and San In publication, Gordon and White 1994, Sawyer and Keeler-Wolf 1995

***Ceanothus crassifolius* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	CECR	*Ceanothus crassifolius*	100	38.3	7	75
	ADFA	*Adenostoma fasciculatum*	100	4.4	0.2	15
	SAME3	*Salvia mellifera*	91.3	3.8	0.2	10
	MALA6	*Malosma laurina*	87	3.9	0.2	11
	HEAR5	*Heteromeles arbutifolia*	60.9	1.2	0.2	7
	ERFA2	*Eriogonum fasciculatum*	56.5	1.2	0.2	7
	QUBE5	*Quercus berberidifolia*	47.8	2.1	0.2	15
	RHOV	*Rhus ovata*	47.8	1.5	0.2	8
	CEBE3	*Cercocarpus betuloides*	39.1	3.4	0.2	22
	ARCA11	*Artemisia californica*	39.1	0.9	0.2	6
	CEOL	*Ceanothus oliganthus*	34.8	1.8	0.2	13
	XYBI	*Xylococcus bicolor*	30.4	6.5	6	40
	RHIL	*Rhamnus ilicifolia*	26.1	0.5	0.2	4
	ERCO25	*Eriophyllum confertiflorum*	21.7	0.1	0.2	2
Herb	MAMA8	*Marah macrocarpus*	34.8	0.3	0.2	4
	BRMA3	*Bromus madritensis*	21.7	1.4	3	10
	EUCH	*Eucrypta chrysanthemifolia*	17.4	1.5	0.2	30

***Ceanothus cuneatus* Alliance (Wedgeleaf Ceanothus)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Ceanothus cuneatus* Shrubland form an open to intermittent shrub layer (20-55%, mean 37.5%), where *Ceanothus cuneatus* dominates. Shrubs consistently occur in two different strata, with low shrubs at 0.5-1m tall and tall shrubs at 1-2m tall. The herbaceous layer is open (15-20%, mean 17.5%) at 0-0.5m tall. Total vegetation cover is 33-70% (mean 51.5%).

In the two stands sampled, *Ceanothus cuneatus* was dominant at variable cover and *Eriogonum fasciculatum* and *Sambucus mexicana* were consistently present at low cover. A variety of native and non-native herbs occupy the herb understory, including *Bromus madritensis* and *Camissonia* sp.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3,936-4,144 ft., mean 4,040 ft.
Aspect: SW
Slope: moderate, range 6-7 degrees, mean 6.5 degrees
Topography: undulating, lower slopes
Litter Cover: range 5-12%, mean 8.5%
Rock Cover: range 33-54%, mean 43.5%
Bare ground: range 30-60%, mean 45%
Parent Material: alluvium
Soil Texture: moderately coarse to very fine sandy loam

The *Ceanothus cuneatus* Alliance was sampled only in the San Gorgonio Mountains (M262Bg) Subsection of the study area on exposed, south-facing slopes at mid-elevations.

Samples used to describe alliance: (n=2) WRIV0962, WRIV0966

RANK: G5 S5 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: North Coast, montane Central Coast Ranges (including San Benito County), Klamath Ranges, Cascade Ranges, Sierra Nevada foothills (including Tuolumne County), montane Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (including Western Riverside County: San Gorgonio Mountains), Baja CA, Oregon

REFERENCES
Borchert 2004, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens et al. 2004, Sawyer and Keeler-Wolf 1995

***Ceanothus cuneatus* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Understory	QUWI2-m	*Quercus wislizeni*	50	0.1	0.2	0.2
Shrub	CECU	*Ceanothus cuneatus*	100	30	15	45
	SAME5	*Sambucus mexicana*	100	2.5	2	3
	ERFA2	*Eriogonum fasciculatum*	100	2.1	0.2	4
	CELE2	*Ceanothus leucodermis*	50	1.5	3	3
	ADFA	*Adenostoma fasciculatum*	50	1	2	2
	RHTR	*Rhus trilobata*	50	1	2	2
	GUSA2	*Gutierrezia sarothrae*	50	0.5	1	1
	SEFL3	*Senecio flaccidus*	50	0.5	1	1
	OPBA2	*Opuntia basilaris*	50	0.1	0.2	0.2
	YUWH	*Yucca whipplei*	50	0.1	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	100	6	5	7
	CAMIS	*Camissonia*	100	0.6	0.2	1
	CRIN8	*Cryptantha intermedia*	50	4	8	8
	ERCI6	*Erodium cicutarium*	50	4	8	8
	ERIOG	*Eriogonum*	50	0.5	1	1
	FICA2	*Filago californica*	50	0.5	1	1
	SACO6	*Salvia columbariae*	50	0.5	1	1
	ERSE3	*Eremocarpus setigerus*	50	0.1	0.2	0.2
	GNCA	*Gnaphalium californicum*	50	0.1	0.2	0.2
	HUHE	*Hulsea heterochroma*	50	0.1	0.2	0.2
	LUBI	*Lupinus bicolor*	50	0.1	0.2	0.2

***Ceanothus integerrimus* Alliance (Deerbrush)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Ceanothus integerrimus* Shrubland form an intermittent to continuous shrub layer (65-89%, mean 78%), where *Ceanothus integerrimus* dominates. Shrubs consistently occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is open to intermittent (5-50%, mean 23.3%) at 0-1m tall, and includes a mixture of non-native and native species (see species table). Emergent trees occur sometimes (2% cover, mean 2%) 10-15m tall, with *Quercus chrysolepis* occasionally present. Total vegetation cover is 84-91% (mean 88.3%).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2,009-6,363 ft., mean 4,470 ft.
Aspect: NW and NE
Slope: somewhat steep to steep, range 16-32 degrees, mean 26 degrees
Topography: concave or undulating, mid to upper slopes
Litter Cover: range 37-85%, mean 57.3%
Rock Cover: range 0-30%, mean 15.7%
Bare ground: range 10-40%, mean 20.7%
Parent Material: Mesozoic granite, metavolcanic
Soil Texture: medium to very fine sandy loam

The *Ceanothus integerrimus* Alliance was sampled in the Santa Ana Mountains (M262Bf) and San Jacinto Mountains (M262Bm) Subsections along north-trending, lower to middle elevations that are moderately steep.

Samples used to describe alliance: (n=3) WRIV0778, WRIV0853, WRIV0997

RANK: G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: North and Central Coast, Klamath Ranges, Cascade Ranges, Sierra Nevada (including Yosemite), Transverse and Peninsular Ranges (including Western Riverside and San Diego Counties), Anza-Borrego Desert

REFERENCES
CDFG 1998, Evens and San In publication, NatureServe et al. 2003b, Sawyer and Keeler-Wolf 1995

***Ceanothus integerrimus* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	QUCH2-t	*Quercus chrysolepis*	33.3	0.7	2	2
Tree Understory	QUWI2-m	*Quercus wislizeni*	33.3	1.3	4	4
Shrub	CEIN3	*Ceanothus integerrimus*	100	52.7	30	80
	RHCA	*Rhamnus californica*	33.3	6.7	20	20
	CEOL	*Ceanothus oliganthus*	33.3	2.7	8	8
	RHIL	*Rhamnus ilicifolia*	33.3	2.7	8	8
	HEAR5	*Heteromeles arbutifolia*	33.3	2	6	6
	PRIL	*Prunus ilicifolia*	33.3	2	6	6
	RHTR	*Rhus trilobata*	33.3	2	6	6
	RHOV	*Rhus ovata*	33.3	1.7	5	5
	KECO	*Keckiella cordifolia*	33.3	1.3	4	4
	MALA6	*Malosma laurina*	33.3	1.3	4	4
	RIROR	*Ribes roezlii* var. *roezlii*	33.3	1.3	4	4
	LOSU2	*Lonicera subspicata*	33.3	1	3	3
	MIAU	*Mimulus aurantiacus*	33.3	1	3	3
	QUBE5	*Quercus berberidifolia*	33.3	1	3	3
	CECR	*Ceanothus crassifolius*	33.3	0.7	2	2
	RIMA	*Ribes malvaceum*	33.3	0.3	1	1
	RIQU	*Ribes quercetorum*	33.3	0.3	1	1
	SAME5	*Sambucus mexicana*	33.3	0.3	1	1
	BAEM	*Baccharis emoryi*	33.3	0.1	0.2	0.2
	HASQ2	*Hazardia squarrosa*	33.3	0.1	0.2	0.2
	RHTO6	*Rhamnus tomentella*	33.3	0.1	0.2	0.2
Herb	BRTE	*Bromus tectorum*	66.7	11.7	5	30
	CLPA5	*Claytonia parviflora*	33.3	4	12	12
	CLPE	*Claytonia perfoliata*	33.3	1.3	4	4
	NEME	*Nemophila menziesii*	33.3	1	3	3
	ANTO	*Angelica tomentosa*	33.3	0.7	2	2
	DRAR3	*Dryopteris arguta*	33.3	0.7	2	2
	GAAN2	*Galium angustifolium*	33.3	0.3	1	1
	THFE	*Thalictrum fendleri*	33.3	0.3	1	1

***Ceanothus leucodermis* Alliance (Chaparral Whitethorn)**

ASSOCIATIONS
Ceanothus leucodermis

LOCAL VEGETATION DESCRIPTION
Stands of *Ceanothus leucodermis* Shrubland form an open to continuous shrub layer (12-85%, mean 50.1%), where *Ceanothus leucodermis* usually dominates. The shrub layer is often in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-5m tall. Emergent trees occur infrequently (0.2-18% cover, mean 6.8%) at 5-20m tall, including conifers and hardwoods. The herbaceous layer is open to continuous (0.2-80%, mean 33.4%) at 0-0.5m tall, and includes a variety of native and non-native herbs (see species table). Total vegetation cover is 62-90% (mean 79.4%).

In the ***Ceanothus leucodermis* Association**, *Ceanothus leucodermis* is dominant or co-dominant, while *Quercus wislizeni*, *Eriogonum fasciculatum*, and *Rhamnus ilicifolia* are characteristically present at lower cover. *Pinus jeffreyi*, *Pinus coulteri*, and *Quercus chrysolepis* are infrequently present at sparse cover in the tree overstory.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4,119-6,465 ft., mean 5,253 ft.
Aspect: variable
Slope: moderate to steep, range 14-40 degrees, mean 25.1 degrees
Topography: more often undulating, less often convex, mid to top slopes
Litter Cover: range 19-60%, mean 35.1%
Rock Cover: range 22-59%, mean 39.1%
Bare ground: range 2-45%, mean 21.3%
Parent Material: more often Mesozoic granite, less often metavolcanic
Soil Texture: most often medium to very fine sandy loam, infrequently moderately coarse sandy loam

The *Ceanothus leucodermis* Alliance was sampled in the Santa Ana Mountains (M262Bf) and San Jacinto Mountains (M262Bm) Subsections at middle elevations that are moderately steep.

Samples used to describe alliance: (n=8) WRIV0337, WRIV0790, WRIV0791, WRIV0806, WRIV0807, WRIV0818, WRIV0852, WRIV0905

RANK: G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Sierra Nevada foothills, montane Central Coast (including San Benito County), Transverse and Peninsular Ranges (including San Bernardino, San Gabriel, Santa Ana and San Jacinto Mountains and western foothills of San Diego County), Baja CA

Ceanothus leucodermis Association: Transverse and Peninsular Ranges (including San Bernardino, San Gabriel, Santa Ana, and San Jacinto Mountains and western foothills in San Diego County)

REFERENCES
CNPS and CDFG 2005a, Evens and San In publication, Gordon and White 1994, NatureServe 2003b, Sawyer and Keeler-Wolf 1995

***Ceanothus leucodermis* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PIJE-t	*Pinus jeffreyi*	25	1.4	1	10
Tree Understory	QUWI2-m	*Quercus wislizeni*	50	2.4	2	9
Shrub	CELE2	*Ceanothus leucodermis*	100	34.6	6	63
	ERFA2	*Eriogonum fasciculatum*	62.5	5.5	6	12
	RHIL	*Rhamnus ilicifolia*	50	0.5	0.2	2
	ERCR2	*Eriodictyon crassifolium*	37.5	2.5	0.2	18
	RHCA	*Rhamnus californica*	37.5	1.3	0.2	6
	CEBE3	*Cercocarpus betuloides*	37.5	0.4	1	1
	ADFA	*Adenostoma fasciculatum*	25	0.2	0.2	1
	ARGL4	*Arctostaphylos glauca*	25	0.1	0.2	0.2
Herb	BRTE	*Bromus tectorum*	100	18	0.2	50
	CRIN8	*Cryptantha intermedia*	75	4.5	2	10
	MEIM	*Melica imperfecta*	37.5	0.9	2	3
	GILIA	*Gilia*	37.5	0.4	1	1
	BRDI3	*Bromus diandrus*	25	1.5	2	10
	MENTZ	*Mentzelia*	25	1.3	5	5
	CAMIS	*Camissonia*	25	0.8	2	4
	NEME	*Nemophila menziesii*	25	0.6	2	3
	PHDI	*Phacelia distans*	25	0.4	1	2

***Ceanothus oliganthus* Alliance (Hairyleaf Ceanothus)**

ASSOCIATIONS
Ceanothus oliganthus-Adenostoma fasciculatum
Ceanothus oliganthus-Arctostaphylos glandulosa
Ceanothus oliganthus-Eriodictyon crassifolium

LOCAL VEGETATION DESCRIPTION
Stands of *Ceanothus oliganthus* Shrubland form an open to continuous shrub layer (24-86%, mean 59.5%), where *Ceanothus oliganthus* dominates or co-dominates. The shrub layer is frequently in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to continuous (0.2-70%, mean 38.7%) at 0-0.5m tall, and consists of a mixture of native and non-native species (see species table). Emergent trees occur infrequently (1% cover, mean 1%) at 5-10m tall, including *Quercus chrysolepis*. Total vegetation cover is 70-90% (mean 79.7%).

In the ***Ceanothus oliganthus-Adenostoma fasciculatum* Association,** *Adenostoma fasciculatum* and *Ceanothus crassifolius* are characteristically present as co-dominant or sub-dominant shrubs. A variety of chaparral shrubs intermix at low cover, including *Heteromeles arbutifolia* and *Quercus berberidifolia*, which are characteristically present in the two stands sampled.

In the ***Ceanothus oliganthus-Arctostaphylos glandulosa* Association,** *Arctostaphylos glandulosa* is consistently present as a co-dominant shrub. Other shrubs that are commonly present at low cover include *Dendromecon rigida*, *Adenostoma fasciculatum*, and *Quercus berberidifolia*.

In the ***Ceanothus oliganthus-Eriodictyon crassifolium* Association,** *Eriodictyon crassifolium* and *Adenostoma fasciculatum* are characteristically present in the shrub overstory as sub-dominants. Other shrubs frequently found at low cover in this association include *Eriogonum fasciculatum*, *Arctostaphylos glauca*, and *Prunus ilicifolia*.

Ceanothus tomentosus and *Ceanothus oliganthus* were sometimes indiscernible during field survey or when plant collections were taken to local herbaria. It is possible that *Ceanothus tomentosus* occurred in the eleven stands sampled.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,994-3,930 ft., mean 2,902 ft.
Aspect: NW and NE
Slope: gentle to steep, range 2-42 degrees, mean 21.7 degrees
Topography: variable, but more often undulating, lower to top slopes
Litter Cover: range 10-88%, mean 57.5%
Rock Cover: range 2-45%, mean 18%
Bare ground: range 1-50%, mean 16.1%
Parent Material: more often Mesozoic granite, less often sedimentary or metavolcanic
Soil Texture: more often medium to very fine sandy loam, but varies from coarse loamy sand to medium silt loam

The *Ceanothus oliganthus* Alliance was sampled in the Santa Ana Mountains (M262Bf) and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections on north-trending, lower to mid-slopes of the mountains.

Samples used to describe alliance: (n=11) WRIV0342, WRIV0376, WRIV0388, WRIV0396, WRIV0397, WRIV0500, WRIV0562, WRIV0565, WRIV0578, WRIV0610, WRIV0614

RANK: G3 S3

GLOBAL DISTRIBUTION

Alliance: North Coast, Central Coast (including Los Padres National Forest), Transverse and Peninsular Ranges (including Santa Monica Mountains; Western Riverside County: Santa Ana and San Jacinto Mountains; San Diego County: western foothills)

Ceanothus oliganthus-Adenostoma fasciculatum Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains), though full distribution is not known
Ceanothus oliganthus-Arctostaphylos glandulosa Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known
Ceanothus oliganthus-Eriodictyon crassifolium Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains Subsection), though full distribution is not known

REFERENCES

Borchert et al. 2004, CNPS and CDFG 2005b, Evens and San In publication, Sawyer and Keeler-Wolf 1995

***Ceanothus oliganthus* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	CEOL	*Ceanothus oliganthus*	100	32.1	11	59
	ADFA	*Adenostoma fasciculatum*	90.9	5.5	0.2	25
	HEAR5	*Heteromeles arbutifolia*	54.5	2.3	0.2	8
	QUBE5	*Quercus berberidifolia*	45.5	3	1	19
	ARGL3	*Arctostaphylos glandulosa*	36.4	6.4	0.2	30
	DERI	*Dendromecon rigida*	36.4	2.7	0.2	15
	ERFA2	*Eriogonum fasciculatum*	36.4	1	1	5
	SAME3	*Salvia mellifera*	36.4	1	1	5
	ERCR2	*Eriodictyon crassifolium*	27.3	2.4	3	19
	CECR	*Ceanothus crassifolius*	27.3	1.6	0.2	13
	RHOV	*Rhus ovata*	27.3	0.1	0.2	0.2
Herb	EUCH	*Eucrypta chrysanthemifolia*	36.4	7.1	15	23
	MAMA8	*Marah macrocarpus*	36.4	0.9	0.2	7
	BRMA3	*Bromus madritensis*	27.3	5.4	2	37
	AMME	*Amsinckia menziesii*	27.3	2.8	5	20
	CLPE	*Claytonia perfoliata*	18.2	3.1	14	20
	BRDI3	*Bromus diandrus*	18.2	2.7	10	20
	BOIN3	*Bowlesia incana*	18.2	1.2	5	8
	GAAN2	*Galium angustifolium*	18.2	0.2	1	1

***Cercocarpus betuloides* Alliance (Birchleaf Mountain-mahogany)**

ASSOCIATIONS
Cercocarpus betuloides
Cercocarpus betuloides-Prunus ilicifolia-Adenostoma sparsifolium

LOCAL VEGETATION DESCRIPTION
Stands of *Cercocarpus betuloides* Shrubland form an open to continuous shrub layer (28-80%, mean 50.3%), where *Cercocarpus betuloides* dominates or co-dominates with other shrubs. The shrub layer is often in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is open to intermittent (0.2-60%, mean 14.7%) at 0-0.5m tall, with a variety of native and non-native species (see species table). Trees occur infrequently in the medium layer (0.2% cover, mean 0.2%) at 2-5m tall. Total vegetation cover is 28-80% (mean 49.9%).

In the ***Cercocarpus betuloides* Association**, *Cercocarpus betuloides* is usually the dominant species in the shrub overstory. A variety of shrubs consistently intermix as sub-dominants, including *Heteromeles arbutifolia*, *Ceanothus crassifolius*, *Rhamnus ilicifolia*, *Prunus ilicifolia*, and *Salvia mellifera*. Other species that commonly occur at low cover include the shrub *Adenostoma fasciculatum* and herb *Dudleya pulverulenta*.

In the ***Cercocarpus betuloides-Prunus ilicifolia-Adenostoma sparsifolium* Association,** *Prunus ilicifolia* is consistently present as a co-dominant or sub-dominant shrub, while *Adenostoma sparsifolium* is consistently sub-dominant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,707-5,686 ft., mean 3,468 ft.
Aspect: more often NW and NE, less often SE
Slope: somewhat steep to very steep, range 20-52 degrees, mean 34.3 degrees
Topography: variable, but more often undulating, lower to upper slopes
Litter Cover: range 22-80%, mean 47.9%
Rock Cover: range 0-80%, mean 41.3%
Bare ground: range 0-55%, mean 15.7%
Parent Material: more often Mesozoic granite, less often metavolcanic or mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, less often medium loam

The *Cercocarpus betuloides* Alliance was sampled in the Santa Ana Mountains (M262Bf), San Jacinto Foothills - Cahuilla Mountains (M262Bl), and San Jacinto Mountains (M262Bm) Subsections at lower to middle elevations that are usually north-trending (or neutral).

Samples used to describe alliance: (n=12) WRIV0059, WRIV0064, WRIV0068, WRIV0077, WRIV0155, WRIV0255, WRIV0349, WRIV0350, WRIV0384, WRIV0391, WRIV0770, WRIV0825

RANK: G5 S5

GLOBAL DISTRIBUTION
Alliance: inner North Coast, montane North Coast, inner Central Coast (including Santa Clara and San Benito Counties and Los Padres National Forest), Klamath Foothills, montane Klamath Ranges, Cascade Range and Sierra Nevada foothills, montane Sierra Nevada, Southern California (including Santa Monica Mountains and Peninsular Ranges in Western Riverside County), Channel Islands, Modoc Plateau, Oregon, Arizona

Cercocarpus betuloides Association: western Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (Western Riverside County: Santa Ana Mountains), though full distribution is not known

Cercocarpus betuloides-Prunus ilicifolia-Adenostoma sparsifolium Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known

REFERENCES

Borchert 2004, CDFG 1998, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San 2004, Gordon and White 1994, Sawyer and Keeler-Wolf 1995

***Cercocarpus betuloides* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	CEBE3	*Cercocarpus betuloides*	100	27.9	5	60
	PRIL	*Prunus ilicifolia*	91.7	7.5	0.2	22
	HEAR5	*Heteromeles arbutifolia*	41.7	2.9	4	11
	ADSP	*Adenostoma sparsifolium*	41.7	2.1	0.2	10
	ADFA	*Adenostoma fasciculatum*	41.7	1.3	0.2	6
	RHIL	*Rhamnus ilicifolia*	41.7	1	0.2	4
	CECR	*Ceanothus crassifolius*	33.3	1.1	2	4
	SAME3	*Salvia mellifera*	33.3	0.9	1	5
	QUBE5	*Quercus berberidifolia*	33.3	0.8	1	4
Herb	BRTE	*Bromus tectorum*	25	2.5	2	20
	BRDI3	*Bromus diandrus*	16.7	1.7	10	10
	DUPU	*Dudleya pulverulenta*	16.7	0	0.2	0.2

***Cercocarpus betuloides-Eriogonum fasciculatum* Alliance (Birchleaf Mountain-mahogany – California Buckwheat)**

ASSOCIATIONS
Cercocarpus betuloides-Eriogonum fasciculatum
Cercocarpus betuloides-Eriogonum fasciculatum-Eriogonum wrightii

LOCAL VEGETATION DESCRIPTION
Stands of *Cercocarpus betuloides-Eriogonum fasciculatum* Shrubland form an open to intermittent shrub layer (24-42%, mean 31.6%), where both shrubs usually are co-dominant, though occasionally either species may be sub-dominant to the other. The shrub layer is in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (3-45%, mean 24.2%) at 0-0.5m tall, where *Bromus tectorum* mixes with a variety of other non-native and native herbs in the understory (see species table). Total vegetation cover is 26-70% (mean 49.1%).

In the ***Cercocarpus betuloides-Eriogonum fasciculatum* Association,** *Prunus ilicifolia* is frequently present at sparse cover while other shrubs (e.g., *Adenostoma sparsifolium*, *Opuntia parryi, Ceanothus greggii*) may be present at trace cover.

In the ***Cercocarpus betuloides-Eriogonum fasciculatum-Eriogonum wrightii* Association,** *Eriogonum wrightii* and *Adenostoma sparsifolium* are characteristically present as co-dominant or sub-dominant shrubs.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3,970-4,663 ft., mean 4,385 ft.
Aspect: all aspects (except flat)
Slope: moderate to steep, range 6-38 degrees, mean 15.6 degrees
Topography: more often undulating, less often convex or flat, lower to top slopes
Litter Cover: range 6-12%, mean 9.6%
Rock Cover: range 55-80%, mean 66.8%
Bare ground: range 5-30%, mean 18.4%
Parent Material: most often Mesozoic granite, infrequently mixed granitic and metamorphic
Soil Texture: more often moderately coarse sandy loam, less often coarse loamy sand or medium to very fine sandy loam

The *Cercocarpus betuloides-Eriogonum fasciculatum* Alliance was sampled in the southwestern portion of the study area in the San Jacinto Foothills - Cahuilla Mountains (M262Bl) and Palomar - Cuyamaca Peak, (M262Bo) Subsections.

Samples used to describe alliance: (n=13) WRAA.131, WRIV0133, WRIV0134, WRIV0135, WRIV0139, WRIV0152, WRIV0158, WRIV0159, WRIV0169, WRIV0170, WRIV0177, WRIV0178, WRIV0694, WRIV0696, WRIV1025, WRIV1026

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: Central Coast (including San Benito County), South Coast , montane Transverse Ranges (including Santa Monica and San Bernardino Mountains), Peninsular Ranges (including Western Riverside County), western Mojave and Colorado Deserts

Cercocarpus betuloides-Eriogonum fasciculatum Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains and Palomar - Cuyamaca Peak Subsections), though full distribution is not known
Cercocarpus betuloides-Eriogonum fasciculatum-Eriogonum wrightii Association: (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains and Palomar - Cuyamaca Peak Subsections), though full distribution is not known

REFERENCES

CNPS and CDFG 2005a, CNPS and CDFG 2005b, Gordon and White 1994, Keeler-Wolf 1990, Sawyer and Keeler-Wolf 1995

***Cercocarpus betuloides-Eriogonum fasciculatum* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	CEBE3	*Cercocarpus betuloides*	81.3	9	0.2	28
	ERFA2	*Eriogonum fasciculatum*	81.3	7.8	0.2	22
	ADSP	*Adenostoma sparsifolium*	56.3	2.4	0.2	21
	ERWR	*Eriogonum wrightii*	43.8	1.5	0.2	11
	PRIL	*Prunus ilicifolia*	43.8	0.6	0.2	3
	OPPA2	*Opuntia parryi*	25	1.3	0.2	15
Herb	BRTE	*Bromus tectorum*	81.3	9.9	0.2	30
	BROMU	*Bromus*	25	3.3	6	18
	BRMA3	*Bromus madritensis*	25	0.5	1	3
	BRDI3	*Bromus diandrus*	18.8	1	2	10
	LOTUS	*Lotus*	18.8	0.4	1	4
	AMME	*Amsinckia menziesii*	18.8	0.1	0.2	1

***Encelia californica* Alliance (California Encelia)**

ASSOCIATIONS
Encelia californica-Artemisia californica

LOCAL VEGETATION DESCRIPTION
Stands of *Encelia californica* Shrubland form an open to intermittent shrub layer (25-45%, mean 37%) at 0.5-2m tall, where *Encelia californica* is dominant or co-dominant. The herbaceous layer is open to intermittent (3-45%, mean 19.5%) at 0-0.5m tall. Total vegetation cover is 30-75% (mean 50.5%).

In the ***Encelia californica-Artemisia californica* Association,** *Artemisia californica* is either co-dominant or sub-dominant. Other shrubs may intermix at low cover, the most common species being *Eriogonum fasciculatum*, *Opuntia parryi*, and *Lessingia filaginifolia*. A variety of native and non-native forbs and grasses occupy the herb understory (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,044-2,095 ft., mean 1,511 ft.
Aspect: variable
Slope: somewhat steep to steep, range 20-33 degrees, mean 25.5 degrees
Topography: variable, mid to upper slopes
Litter Cover: range 3-15%, mean 8.3%
Rock Cover: range 25-50%, mean 35.5%
Bare ground: range 45-63%, mean 53.3%
Parent Material: more often Mesozoic granite, less often sedimentary
Soil Texture: more often medium to very fine sandy loam, less often moderately coarse sandy loam

The *Encelia californica* Alliance was sampled in the Fontana Plain - Calimesa Terraces (M262Bj) and Perris Valley and Hills (M262Bk) Subsections along lower elevation, steep-sloping hills.

Samples used to describe alliance: (n=4) WRIV0426, WRIV0539, WRIV0634, WRIV0645

RANK: G1 S1, G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: southern outer Central Coast, South Coast (including Western Riverside and San Diego Counties), western Transverse Ranges (including Santa Monica Mountains), Channel Islands

Encelia californica-Artemisia californica Association: South Coast (Ventura to Riverside and San Diego Counties on coastal valleys, hills, and terraces)

REFERENCES
CNPS and CDFG 2005b, Evens and San In publication, Malanson 1984, Sawyer and Keeler-Wolf 1995

***Encelia californica* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ENCA	*Encelia californica*	100	24.3	9	33
	ARCA11	*Artemisia californica*	100	6.5	2	10
	ERFA2	*Eriogonum fasciculatum*	75	2.3	2	4
	OPPA2	*Opuntia parryi*	50	0.3	0.2	1
	ENFA	*Encelia farinosa*	25	0.5	2	2
	GUCA	*Gutierrezia californica*	25	0.3	1	1
	LYAN	*Lycium andersonii*	25	0.3	1	1
	OPUNT	*Opuntia*	25	0.3	1	1
	SAME3	*Salvia mellifera*	25	0.3	1	1
	ADFA	*Adenostoma fasciculatum*	25	0.1	0.2	0.2
	JUCA7	*Juniperus californica*	25	0.1	0.2	0.2
	KEAN	*Keckiella antirrhinoides*	25	0.1	0.2	0.2
	SAME5	*Sambucus mexicana*	25	0.1	0.2	0.2
Herb	MICA6	*Mirabilis californica*	100	1.8	1	4
	HIIN3	*Hirschfeldia incana*	75	4.3	1	15
	AMME	*Amsinckia menziesii*	75	1	0.2	3
	ERODI	*Erodium*	50	6.3	10	15
	ERCI6	*Erodium cicutarium*	50	4	1	15
	BRMA3	*Bromus madritensis*	50	1.8	2	5
	SCBA	*Schismus barbatus*	50	0.6	0.2	2
	LEFI11	*Lessingia filaginifolia*	50	0.1	0.2	0.2
	CRCO34	*Crassula connata*	25	1.3	5	5
	PLCO13	*Plagiobothrys collinus*	25	0.8	3	3
	BRTE	*Bromus tectorum*	25	0.5	2	2
	PHACE	*Phacelia*	25	0.5	2	2
	CAMA24	*Calystegia macrostegia*	25	0.3	1	1
	ALCA2	*Allium campanulatum*	25	0.1	0.2	0.2
	DICA14	*Dichelostemma capitatum*	25	0.1	0.2	0.2
	HELIA3	*Helianthus*	25	0.1	0.2	0.2
	NEME	*Nemophila menziesii*	25	0.1	0.2	0.2
	PHMI	*Phacelia minor*	25	0.1	0.2	0.2
	SACO6	*Salvia columbariae*	25	0.1	0.2	0.2
	SAHI2	*Sarcostemma hirtellum*	25	0.1	0.2	0.2
Cryptogam	MOSS	Moss	25	2	8	8
	CRYPTO	Cryptogamic crust	25	0.1	0.2	0.2

***Encelia farinosa* Alliance (Brittlebush)**

ASSOCIATIONS
Encelia farinosa
Encelia farinosa-Artemisia californica

LOCAL VEGETATION DESCRIPTION
Stands of *Encelia farinosa* Shrubland form an open to intermittent shrub layer (11-58%, mean 28.7%), where *Encelia farinosa* dominates or co-dominates at low to moderate cover. Shrubs infrequently occur in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to continuous (4-80%, mean 29.8%) at 0-1m tall, and includes diverse mixtures of annual herbs in the stands (see species table). Total vegetation cover is 18-90% (mean 53%).

In the ***Encelia farinosa* Association,** *Encelia farinosa* is the sole dominant shrub. The most common shrubs that intermix at sparse cover include *Eriogonum fasciculatum*, *Artemisia californica*, *Bebbia juncea*, and *Adenostoma fasciculatum*.

In the ***Encelia farinosa-Artemisia californica* Association,** *Artemisia californica* is usually co-dominant with *Encelia farinosa*. *Rhus ovata*, *Salvia mellifera*, *Adenostoma fasciculatum*, and *Eriogonum fasciculatum* are occasionally present at sparse cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 997-2,893 ft., mean 1,880 ft.
Aspect: variable, but more often SE and SW
Slope: moderate to very steep, range 10-50 degrees, mean 26.6 degrees
Topography: more often undulating, less often convex or flat, lower to upper slopes
Litter Cover: range 1-45%, mean 13.8%
Rock Cover: range 10-89%, mean 44.6%
Bare ground: range 5-87%, mean 34%
Parent Material: more often sedimentary or Mesozoic granite, less often metavolcanic or mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, but varies from sand to clay

The *Encelia farinosa* Alliance was sampled in the Perris Valley and Hills (M262Bk) and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections, usually along steep and exposed south-facing slopes.

Samples used to describe alliance: (n=27) WRAA.005, WRAA.026, WRAA.085, WRAA.090, WRAA.098, WRAA.105, WRAA.122, WRAA.124, WRIV0008, WRIV0405, WRIV0406, WRIV0411, WRIV0434, WRIV0437, WRIV0440, WRIV0458, WRIV0465, WRIV0471, WRIV0488, WRIV0493, WRIV0496, WRIV0523, WRIV0554, WRIV0817, WRIV0822, WRIV0941, WRIV0943

RANK: G5 S5 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: inner South Coast and Peninsular Ranges (including Western Riverside County), Mojave Desert, Colorado Desert, Arizona, Nevada, Utah, Mexico

Encelia farinosa Association: South Coast and Peninsular Ranges (Western Riverside County: Perris Valley and Hills and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known
Encelia farinosa-Artemisia californica Association: South Coast and Peninsular Ranges (Western Riverside County: Perris Valley and Hills and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known

REFERENCES
CDFG 1998, CNPS 2005, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004, White 1994

***Encelia farinosa* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ENFA	*Encelia farinosa*	100	21.3	5	45
	ERFA2	*Eriogonum fasciculatum*	66.7	1	0.2	5
	ARCA11	*Artemisia californica*	59.3	3.3	0.2	22
	ADFA	*Adenostoma fasciculatum*	25.9	0.9	0.2	9
	BEJU	*Bebbia juncea*	25.9	0.4	0.2	4
Herb	HIIN3	*Hirschfeldia incana*	63	3.7	0.2	18
	BRMA3	*Bromus madritensis*	40.7	3.5	0.2	25
	MICA6	*Mirabilis californica*	40.7	0.6	0.2	4
	SCBA	*Schismus barbatus*	37	4.4	3	47
	ERODI	*Erodium*	33.3	5.6	2	78
	SACO6	*Salvia columbariae*	33.3	0.9	0.2	8
	CRIN8	*Cryptantha intermedia*	29.6	1	1	7
	ERCI6	*Erodium cicutarium*	25.9	1.6	1	15
	PHMI	*Phacelia minor*	22.2	0.3	0.2	5
	AMME	*Amsinckia menziesii*	18.5	1	2	15
	BRTO	*Brassica tournefortii*	18.5	0.9	1	10
Herb	CAMIS	*Camissonia*	18.5	0.3	0.2	3

***Ericameria palmeri* Alliance (Palmer's Goldenbush)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Ericameria palmeri* Shrubland form an open shrub layer (12-15%, mean 13.5%) at 0.5-1m tall, where *Ericameria palmeri* dominates. The herbaceous layer is continuous (68-70%, mean 69%) at 0-1m tall. Total vegetation cover is 72-80% (mean 76%).

This alliance is dominated by scattered *Ericameria palmeri* shrubs that create an open canopy over a dense herb layer that includes *Hirschfeldia incana*, *Bromus madritensis*, *Hemizonia fasciculata*, *Amsinckia menziesii*, *Cryptantha intermedia*, and *Erodium* spp.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,402-1,417 ft., mean 1,410 ft.
Aspect: flat and SE
Slope: flat to moderate, range 0-8 degrees, mean 4 degrees
Topography: flat or convex, lower to mid slopes
Litter Cover: range 8-15%, mean 11.5%
Rock Cover: range 12-20%, mean 16%
Bare ground: range 60-72%, mean 66%
Parent Material: Mesozoic granite
Soil Texture: fine sand, medium loam

The *Ericameria palmeri* Alliance was sampled only in the Perris Valley and Hills (M262Bk) Subsection. It is particularly found near Lake Mathews on flats and low slopes, where *Ericameria palmeri* occurs with an abundant understory of native and non-native annual herbs.

Samples used to describe alliance: (n=2) WRIV0541, WRIV1021

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: inner South Coast (Western Riverside County-Perris Valley and Hills), though full distribution is not known

REFERENCES
No reference citations

***Ericameria palmeri* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ERPAP	*Ericameria palmeri* var. *pachylepis*	100	10.5	10	11
	HASQ2	*Hazardia squarrosa*	50	1.5	3	3
	GUCA	*Gutierrezia californica*	50	1	2	2
	ERFA2	*Eriogonum fasciculatum*	50	0.5	1	1
Herb	BRMA3	*Bromus madritensis*	100	8.5	2	15
	HIIN3	*Hirschfeldia incana*	100	1.1	0.2	2
	ERODI	*Erodium*	50	15	30	30
	HEFA	*Hemizonia fasciculata*	50	14.5	29	29
	AMME	*Amsinckia menziesii*	50	11.5	23	23
	CRIN8	*Cryptantha intermedia*	50	11.5	23	23
	PLAGI	*Plagiobothrys*	50	3.5	7	7
	ERCI6	*Erodium cicutarium*	50	2.5	5	5
	HOMA2	*Hordeum marinum*	50	1	2	2
	LACA7	*Lasthenia californica*	50	1	2	2
	CRCO34	*Crassula connata*	50	0.1	0.2	0.2
	DICA14	*Dichelostemma capitatum*	50	0.1	0.2	0.2
	LAPL	*Layia platyglossa*	50	0.1	0.2	0.2
	LOST4	*Lotus strigosus*	50	0.1	0.2	0.2

***Eriodictyon crassifolium* Alliance (Yerba Santa)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Eriodictyon crassifolium Shrubland forms an open to intermittent shrub layer (20-35%, mean 29.8%), where *Eriodictyon crassifolium* dominates. Shrubs consistently occur in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-5m tall. Emergent trees occur infrequently (1% cover, mean 1%), including *Quercus wislizeni*. The herbaceous layer is open (1-30%, mean 16.5%) at 0-0.5m tall, with a variety of native and non-native herbs (see species table). Total vegetation cover is 30-50% (mean 39.3%).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2,711-5,629 ft., mean 3,953 ft.
Aspect: variable
Slope: gentle to moderate, range 2-7 degrees, mean 4.7 degrees
Topography: variable, lower to top slopes
Litter Cover: range 10-25%, mean 15.5%
Rock Cover: range 25-75%, mean 55.8%
Bare ground: range 7-58%, mean 26.3%
Parent Material: Mesozoic granite, sedimentary
Soil Texture: varies from moderately coarse sandy loam to moderately fine clay loam

The *Eriodictyon crassifolium* Alliance was sampled in the Santa Ana Mountains (M262Bf), San Jacinto Foothills - Cahuilla Mountains (M262Bl), and San Jacinto Mountains (M262Bm) Subsections across lower to middle elevations. This alliance is initiated with disturbance such as clearing and fire, and may last for at least 20 years after disturbance (J. Evens, personal observation).

Samples used to describe alliance: (n=4) WRIV0218, WRIV0803, WRIV0828, WRIV0908

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: Peninsular Ranges (Western Riverside County: Santa Ana Mountains, San Jacinto Foothills - Cahuilla Mountains, and San Jacinto Mountains Subsections), though full distribution is not known

REFERENCES
No reference citations

***Eriodictyon crassifolium* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	QUWI2-t	*Quercus wislizeni*	25	0.3	1	1
Tree Understory	QUWI2-m	*Quercus wislizeni*	25	0.5	2	2
Shrub	ERCR2	*Eriodictyon crassifolium*	100	15.5	10	20
	ERFA2	*Eriogonum fasciculatum*	100	4.6	0.2	8
	ADFA	*Adenostoma fasciculatum*	75	1.3	0.2	4
	RHOV	*Rhus ovata*	50	1	0.2	4
	ERICA2	*Ericameria*	25	3	12	12
	SAME3	*Salvia mellifera*	25	1.8	7	7
	ADSP	*Adenostoma sparsifolium*	25	0.8	3	3
	RHTR	*Rhus trilobata*	25	0.8	3	3
	LOSU2	*Lonicera subspicata*	25	0.5	2	2
	ARGL4	*Arctostaphylos glauca*	25	0.3	1	1
	ARPR	*Arctostaphylos pringlei*	25	0.3	1	1
	CELE2	*Ceanothus leucodermis*	25	0.3	1	1
	ENFA	*Encelia farinosa*	25	0.3	1	1
	QUBE5	*Quercus berberidifolia*	25	0.3	1	1
	TRPA3	*Trichostema parishii*	25	0.3	1	1
	YUSC2	*Yucca schidigera*	25	0.3	1	1
	CECR	*Ceanothus crassifolius*	25	0.1	0.2	0.2
	CECU	*Ceanothus cuneatus*	25	0.1	0.2	0.2
	CEBE3	*Cercocarpus betuloides*	25	0.1	0.2	0.2
	RHIL	*Rhamnus ilicifolia*	25	0.1	0.2	0.2
Herb	BRTE	*Bromus tectorum*	50	3	2	10
	BRMA3	*Bromus madritensis*	50	2.5	0.2	10
	CRMU2	*Cryptantha muricata*	50	1	1	3
	CAMIS	*Camissonia*	50	0.8	1	2
	GILIA	*Gilia*	50	0.1	0.2	0.2
	SCBA	*Schismus barbatus*	25	3	12	12
	CRIN8	*Cryptantha intermedia*	25	2.5	10	10
	LEFI11	*Lessingia filaginifolia*	25	2.5	10	10
	CHAR	*Chaenactis artemisiifolia*	25	0.8	3	3
	PTDR	*Pterostegia drymarioides*	25	0.8	3	3
	FICA2	*Filago californica*	25	0.5	2	2
	SACO6	*Salvia columbariae*	25	0.5	2	2
	CRMI	*Cryptantha micrantha*	25	0.3	1	1
	ERCI6	*Erodium cicutarium*	25	0.1	0.2	0.2
	HUVE	*Hulsea vestita*	25	0.1	0.2	0.2
	LAGL5	*Layia glandulosa*	25	0.1	0.2	0.2
	LOLU	*Lomatium lucidum*	25	0.1	0.2	0.2
	NAPU4	*Nassella pulchra*	25	0.1	0.2	0.2
	PESP3	*Penstemon spectabilis*	25	0.1	0.2	0.2

***Eriogonum fasciculatum* Alliance (California Buckwheat)**

ASSOCIATIONS
Eriogonum fasciculatum
Eriogonum fasciculatum-Bebbia juncea
Eriogonum fasciculatum-Gutierrezia sarothrae
Eriogonum fasciculatum-Opuntia parryi
Eriogonum fasciculatum-Rhus ovata
Eriogonum fasciculatum-Simmondsia chinensis-Opuntia parryi

LOCAL VEGETATION DESCRIPTION
Stands of *Eriogonum fasciculatum* Shrubland form an open to continuous shrub layer (8-70%, mean 31.8%), where *Eriogonum fasciculatum* typically dominates. The shrub layer is often in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to continuous (0.2-75%, mean 18.1%) at 0-2m tall, and includes a variety of native and non-native species (see species table). Emergent trees occur infrequently (1-2% cover, mean 1.3%) at 5-15m tall, including *Pinus quadrifolia*, *Pinus jeffreyi*, non-native *Eucalyptus* spp., *Quercus agrifolia*, *Populus fremontii*, and *Salix laevigata*. Total vegetation cover is 12-85% (mean 45.5%).

In the ***Eriogonum fasciculatum* Association,** *Eriogonum fasciculatum* is consistently present at low to high cover. A wide variety of chaparral, coastal sage, and disturbance shrub species (e.g., *Lotus scoparius, Lessingia filaginifolia*, *Artemisia californica*, *Rhus ovata*, *Salvia apiana*, *Adenostoma fasciculatum*) may be present at low cover. Diverse annual herbs comprise the herb understory, the most common being natives *Cryptantha* spp., and non-natives *Erodium cicutarium*, *Bromus madritensis*, *Bromus diandrus*, and *Hirschfeldia incana*.

In the ***Eriogonum fasciculatum-Bebbia juncea* Association,** *Bebbia juncea* and *Brickellia californica* are consistently present at low cover and *Eriogonum fasciculatum* is frequently the dominant species. *Lotus scoparius* is often present at trace cover.

In the ***Eriogonum fasciculatum-Gutierrezia sarothrae* Association,** *Eriogonum fasciculatum* is dominant to co-dominant with *Gutierrezia sarothrae*, and *Yucca schidigera* is often present.

In the ***Eriogonum fasciculatum-Opuntia parryi* Association,** *Opuntia parryi* is consistently present in the shrub overstory and is usually sub-dominant, though it may be co-dominant. *Yucca schidigera*, *Artemisia tridentata*, and *Lotus scoparius* are the most common shrubs that intermix at sparse cover.

In the ***Eriogonum fasciculatum-Rhus ovata* Association,** both shrub species are consistently present and *Rhus ovata* is typically sub-dominant or co-dominant with *Eriogonum fasciculatum*. Various shrub species intermix at low cover, including *Yucca schidigera*, *Opuntia parryi*, *Lotus scoparius*, and *Encelia actoni*.

In the ***Eriogonum fasciculatum-Simmondsia chinensis-Opuntia parryi* Association,** *Simmondsia chinensis* is consistently sub-dominant. Other shrubs often intermix at low cover, including *Yucca schidigera*, *Opuntia parryi*, *Lotus scoparius*, *Rhus ovata*, and *Salvia apiana*. In this association, *Eriogonum fasciculatum* is dominant. In contrast, in the *Simmondsia chinensis-Eriogonum fasciculatum-Opuntia parryi* Association, *Eriogonum fasciculatum* is sub-dominant or co-dominant.

Both *Eriogonum fasciculatum* var. *foliolosum* and *Eriogonum fasciculatum* var. *polifolium* occur in Western Riverside County. Further field data collection and statistical analysis could elucidate differential patterning of the two varieties.

Caulanthus simulans, a CNPS List 4 species (CNPS 2005), was found in 1 of 70 surveys of the *Eriogonum fasciculatum* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 793-5,200 ft., mean 2,798 ft.
Aspect: all aspects
Slope: flat to very steep, range 0-50 degrees, mean 13.8 degrees
Topography: variable, but more often undulating or flat, bottom to top slopes
Litter Cover: range 0-70%, mean 14.4%
Rock Cover: range 0-84%, mean 48.7%
Bare ground: range 0-88%, mean 29.6%
Parent Material: more often Mesozoic granite, less often alluvium, sedimentary, mixed granitic and metamorphic, gabbro and diorite
Soil Texture: more often medium to very fine sandy loam or coarse loamy sand, but varies from coarse sand to moderately fine sandy clay loam

The *Eriogonum fasciculatum* Alliance was the most commonly sampled alliance from all but one subsection of the study area: Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl), San Jacinto Mountains (M262Bm), and Palomar - Cuyamaca Peak, (M262Bo). It occurred in a wide variety of sites on usually well-drained soils.

Samples used to describe alliance: (n=70) WRAA.013, WRAA.057, WRAA.092, WRAA.109, WRAA.110, WRAA.144, WRAA.152, WRAA.153, WRIV0025, WRIV0026, WRIV0028, WRIV0031, WRIV0033, WRIV0034, WRIV0035, WRIV0036, WRIV0037, WRIV0043, WRIV0052, WRIV0058, WRIV0084, WRIV0085, WRIV0086, WRIV0087, WRIV0088, WRIV0089, WRIV0092, WRIV0094, WRIV0106, WRIV0108, WRIV0118, WRIV0125, WRIV0138, WRIV0180, WRIV0181, WRIV0199, WRIV0207, WRIV0211, WRIV0232, WRIV0242, WRIV0322, WRIV0377, WRIV0433, WRIV0480, WRIV0512, WRIV0531, WRIV0556, WRIV0650, WRIV0655, WRIV0667, WRIV0671, WRIV0676, WRIV0682, WRIV0683, WRIV0684, WRIV0686, WRIV0687, WRIV0690, WRIV0698, WRIV0720, WRIV0800, WRIV0816, WRIV0827, WRIV0831, WRIV0849, WRIV0860, WRIV0866, WRIV1027, WRIV1035, WRIV1037

RANK: G2 S3, G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Central Coast (including San Benito County and Los Padres National Forest), South Coast to Transverse and Peninsular Ranges (including Ventura, Western Riverside, Los Angeles, and San Diego Counties), Channel Islands, Mojave and Colorado Deserts (including Anza-Borrego Desert), Baja California

Eriogonum fasciculatum Association: South Coast and Peninsular Ranges (coastal hills/valleys to interior mountains of Ventura to Western Riverside and San Diego Counties)
Eriogonum fasciculatum-Bebbia juncea Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains Subsection), though full distribution is not known
Eriogonum fasciculatum-Gutierrezia sarothrae Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains and Palomar - Cuyamaca Peak Subsections), though full distribution is not known
Eriogonum fasciculatum-Opuntia parryi Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains and Palomar - Cuyamaca Peak Subsections), though full distribution is not known
Eriogonum fasciculatum-Rhus ovata Association: South Coast and Peninsular Ranges (Western Riverside: San Jacinto Mountains and foothills, and Perris Valley and Hills; San Diego County: western foothills and desert slopes)
Eriogonum fasciculatum-Simmondsia chinensis-Opuntia parryi Association: Peninsular Ranges (Western Riverside County: Perris Valley and Hills and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known

REFERENCES

Borchert et al. 2004, CDFG 1998, CNPS 2005, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San In publication, Gordon and White 1994, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004

***Eriogonum fasciculatum* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ERFA2	*Eriogonum fasciculatum*	100	19	1	70
	RHOV	*Rhus ovata*	51.4	2.6	0.2	25
	OPPA2	*Opuntia parryi*	45.7	1.8	0.2	12
	YUSC2	*Yucca schidigera*	45.7	0.8	0.2	6
	LOSC2	*Lotus scoparius*	41.4	1.1	0.2	30
	SAAP2	*Salvia apiana*	27.1	0.4	0.2	11
	ENAC	*Encelia actoni*	25.7	0.8	0.2	13
	ADFA	*Adenostoma fasciculatum*	22.9	0.5	0.2	16
Herb	BRMA3	*Bromus madritensis*	64.3	3.5	0.2	25
	HIIN3	*Hirschfeldia incana*	24.3	0.8	0.2	15
	SACO6	*Salvia columbariae*	24.3	0.2	0.2	4
	AMME	*Amsinckia menziesii*	22.9	0.4	0.2	15
	ERCI6	*Erodium cicutarium*	20	2.3	0.2	50
	BRTE	*Bromus tectorum*	18.6	1.3	1	25
	SCBA	*Schismus barbatus*	17.1	1.1	1	15
	CRYPT	*Cryptantha*	17.1	0.9	0.2	13
	BRDI3	*Bromus diandrus*	15.7	0.8	0.2	18

***Eriogonum fasciculatum-Encelia farinosa* Alliance (California Buckwheat – Brittlebush)**

ASSOCIATIONS
Eriogonum fasciculatum-Encelia farinosa

LOCAL VEGETATION DESCRIPTION
Stands of *Eriogonum fasciculatum-Encelia farinosa* Shrubland form an open to intermittent shrub layer (18-45%, mean 30.3%), where both species usually co-dominate. Shrubs sometimes occur in two different strata, with low shrubs at 0-1m tall and tall shrubs at 0.5-5m tall. The herbaceous layer is open to continuous (0.2-65%, mean 21.8%) at 0-1m tall. Total vegetation cover is 24-85% (mean 47.4%).

In the ***Eriogonum fasciculatum-Encelia farinosa* Association,** *Eriogonum fasciculatum* and *Encelia farinosa* are usually co-dominant, while *Artemisia californica* is characteristically present at low cover *Salvia apiana* is often present at sparse cover. A variety of annual forbs and grasses (e.g., non-natives *Bromus madritensis*, *Erodium* spp., and *Hirschfeldia incana*) occupy the intermediate to continuous herb understory.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,046-2,428 ft., mean 1,760 ft.
Aspect: variable, but more often SE and SW
Slope: gentle to steep, range 4-42 degrees, mean 22.7 degrees
Topography: more often undulating, less often convex or flat, lower to top slopes
Litter Cover: range 0-45%, mean 14.3%
Rock Cover: range 14-70%, mean 40.1%
Bare ground: range 15-65%, mean 40.3%
Parent Material: more often sedimentary, less often Mesozoic granite, alluvium, metavolcanic
Soil Texture: more often moderately fine sandy clay loam, but varies from coarse loamy sand to moderately fine clay loam

The *Eriogonum fasciculatum-Encelia farinosa* Alliance was sampled in the Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections at low elevations usually on exposed gentle to steep slopes.

Samples used to describe alliance: (n=17) WRAA.025, WRAA.027, WRAA.104, WRAA.126, WRAA.161, WRIV0114, WRIV0195, WRIV0196, WRIV0198, WRIV0215, WRIV0321, WRIV0454, WRIV0459, WRIV0472, WRIV0491, WRIV0984, WRIV1022

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: South Coast and Peninsular Ranges (Western Riverside County: Santa Ana Mountains, Perris Valley and Hills, and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known

Eriogonum fasciculatum-Encelia farinosa Association: same as alliance

REFERENCES
No reference citations

***Eriogonum fasciculatum-Encelia farinosa* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ERFA2	*Eriogonum fasciculatum*	100	13.6	6	28
	ENFA	*Encelia farinosa*	100	12.6	5	27
	ARCA11	*Artemisia californica*	76.5	3.3	0.2	15
	SAAP2	*Salvia apiana*	52.9	0.4	0.2	2
	YUWH	*Yucca whipplei*	29.4	0.1	0.2	0.2
	MALA6	*Malosma laurina*	23.5	0.3	0.2	4
	OPPA2	*Opuntia parryi*	23.5	0.1	0.2	1
Herb	BRMA3	*Bromus madritensis*	76.5	5.5	1	30
	HIIN3	*Hirschfeldia incana*	41.2	1.4	0.2	8
	ERODI	*Erodium*	35.3	1.5	1	10
	CRIN8	*Cryptantha intermedia*	23.5	1.5	1	12
	ERCI6	*Erodium cicutarium*	17.6	4.6	3	55
	SCBA	*Schismus barbatus*	17.6	1.8	3	18
	SACO6	*Salvia columbariae*	17.6	0.2	0.2	3
	CEME2	*Centaurea melitensis*	17.6	0.1	0.2	1

***Eriogonum fasciculatum-Salvia apiana* Alliance (California Buckwheat – White Sage)**

ASSOCIATIONS
Eriogonum fasciculatum-Salvia apiana

LOCAL VEGETATION DESCRIPTION
Stands of *Eriogonum fasciculatum-Salvia apiana* Shrubland form an open to intermittent shrub layer (14-58%, mean 33.1%), where both species usually co-dominate. The shrub layer is often in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (0.2-45%, mean 17.4%) at 0-1m tall. Total vegetation cover is 31-75% (mean 45.5%).

In the ***Eriogonum fasciculatum-Salvia apiana* Association,** both *Eriogonum fasciculatum* and *Salvia apiana* are consistently present and usually co-dominate, though one species may be sub-dominant to the other species. A variety of coastal sage and chaparral shrubs (e.g., *Artemisia californica*, *Keckiella antirrhinoides*, *Adenostoma fasciculatum*, *Heteromeles arbutifolia*) may intermix at sparse cover. The most common herbs include native forb *Salvia columbariae* and non-native grass *Bromus madritensis*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,306-5,170 ft., mean 2,854 ft.
Aspect: variable, but more often SE and SW
Slope: moderate to steep, range 10-44 degrees, mean 28.6 degrees
Topography: more often convex or undulating, less often flat, lower to top slopes
Litter Cover: range 12-40%, mean 25.2%
Rock Cover: range 13-78%, mean 43.5%
Bare ground: range 5-60%, mean 27.3%
Parent Material: sedimentary or Mesozoic granite
Soil Texture: more often medium to very fine sandy loam, but varies from moderately coarse sandy loam to moderately fine clay loam

The *Eriogonum fasciculatum-Salvia apiana* Alliance was sampled in the Santa Ana Mountains (M262Bf), Fontana Plain - Calimesa Terraces (M262Bj, Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262BI), and San Jacinto Mountains (M262Bm) Subsections

Samples used to describe alliance: (n=13) WRIV0121, WRIV0184, WRIV0221, WRIV0228, WRIV0261, WRIV0298, WRIV0330, WRIV0535, WRIV0799, WRIV0939, WRIV0940, WRIV0950, WRIV0987

RANK: G3 S3 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: South Coast, Transverse Ranges (Santa Monica Mountains: Simi Hills and eastward), Peninsular Ranges (including Western Riverside and San Diego Counties), Anza-Borrego Desert, Baja California

Eriogonum fasciculatum-Salvia apiana Association: Peninsular Ranges (Western Riverside County: Santa Ana and San Jacinto Mountains; San Diego County: western foothills), South Coast (Western Riverside County: Perris Valley Hills and Fontana Plains - Calimesa Terraces Subsections)

REFERENCES
Boyd et al. 1995, CDFG 1998, CNPS and CDFG 2005b, Evens and San In publication, Gordon and White 1994, Sawyer and Keeler-Wolf 1995

***Eriogonum fasciculatum-Salvia apiana* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ERFA2	*Eriogonum fasciculatum*	100	17.2	4	37
	SAAP2	*Salvia apiana*	100	12.2	1	26
	ARCA11	*Artemisia californica*	53.8	0.5	0.2	2
	YUWH	*Yucca whipplei*	46.2	0.6	0.2	3
	KEAN	*Keckiella antirrhinoides*	38.5	1	0.2	5
	LOSC2	*Lotus scoparius*	38.5	0.5	0.2	5
	ADFA	*Adenostoma fasciculatum*	30.8	0.4	0.2	4
	HEAR5	*Heteromeles arbutifolia*	30.8	0.2	0.2	1
	QUBE5	*Quercus berberidifolia*	23.1	0.5	0.2	5
Herb	BRMA3	*Bromus madritensis*	38.5	2.5	3	10
	CRIN8	*Cryptantha intermedia*	30.8	1.8	1	15
	SACO6	*Salvia columbariae*	30.8	1.3	2	8
	BRTE	*Bromus tectorum*	15.4	1.7	7	15
	PHDI	*Phacelia distans*	15.4	1.2	3	12
	BRDI3	*Bromus diandrus*	15.4	0.6	3	5
	ERCI6	*Erodium cicutarium*	15.4	0.5	1	5
	AMME	*Amsinckia menziesii*	15.4	0.4	0.2	5
	CAMIS	*Camissonia*	15.4	0.4	1	4
	DICA14	*Dichelostemma capitatum*	15.4	0	0.2	0.2

***Eriogonum wrightii* Alliance (Wright's Buckwheat)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Eriogonum wrightii* Shrubland form an open to intermittent shrub layer (7-35%, mean 22.7%), where *Eriogonum wrightii* is usually dominant. Shrubs occasionally occur in two different strata, with low shrubs at 0-0.5m tall and tall shrubs at 2-5m tall. The herbaceous layer is open (17-50%, mean 28%) at 0-1m tall. Total vegetation cover is 23-70% (mean 46.3%).

In the ***Eriogonum wrightii* Alliance**, *Eriogonum wrightii* is consistently present as a dominant or co-dominant species in the shrub overstory. Other shrubs that often sub-dominate include *Artemisia tridentata* and *Artemisia dracunculus*. The non-native grass *Bromus tectorum* is consistently present in the herb understory with a variety of other native and non-native species (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4,349-5,388 ft., mean 4,702 ft.
Aspect: variable
Slope: gentle to moderate, 1-11 degrees, mean 6 degrees
Topography: undulating or flat, bottom to mid slopes
Litter Cover: 30%, mean 30%
Rock Cover: 0.2%, mean 0.2%
Bare Ground: 65%, mean 65%
Parent Material: Mesozoic granite
Soil Texture: coarse to very fine loamy sand

The *Eriogonum wrightii* Alliance was sampled in the eastern portion of the study area in the San Jacinto Foothills - Cahuilla Mountains (M262Blzz) and San Jacinto Mountains (M262Bm) Subsection at middle elevations on relatively gentle slopes with well-drained soils.

Samples used to describe alliance: (n=3) WRIV0002, WRIV0140, WRIV0151

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: Central Coast (including San Benito County), Central Valley (including western Fresno County), Transverse and Peninsular Ranges (Santa Monica Mountains; Western Riverside County: San Jacinto Mountains; San Diego County: Palomar - Cuyamaca Peak region), Mojave and Colorado Deserts (including Anza-Borrego Desert), though full distribution is not known

REFERENCES
CDFG 1998, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San In publication

***Eriogonum wrightii* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ERWR	*Eriogonum wrightii*	100	17	7	34
	ARTR2	*Artemisia tridentata*	66.7	0.7	0.2	2
	CEBE3	*Cercocarpus betuloides*	66.7	0.1	0.2	0.2
	RHIL	*Rhamnus ilicifolia*	33.3	5	15	15
	CELE2	*Ceanothus leucodermis*	33.3	0.3	1	1
	ERFA2	*Eriogonum fasciculatum*	33.3	0.3	1	1
	CECU	*Ceanothus cuneatus*	33.3	0.1	0.2	0.2
	OPPA2	*Opuntia parryi*	33.3	0.1	0.2	0.2
	SAME5	*Sambucus mexicana*	33.3	0.1	0.2	0.2
Herb	BRTE	*Bromus tectorum*	100	14.7	6	30
	BROMU	*Bromus*	66.7	7.7	3	20
	ARDR4	*Artemisia dracunculus*	66.7	4.7	0.2	14
	AMME	*Amsinckia menziesii*	66.7	0.4	0.2	1
	LEFI11	*Lessingia filaginifolia*	66.7	0.1	0.2	0.2
	ERODI	*Erodium*	33.3	3	9	9
	AVENA	*Avena*	33.3	1	3	3
	BRMA3	*Bromus madritensis*	33.3	0.7	2	2
	LEGL18	*Lessingia glandulifera*	33.3	0.7	2	2
	NAPU4	*Nassella pulchra*	33.3	0.7	2	2
	PTAQP2	*Pteridium aquilinum* var. *pubescens*	33.3	0.7	2	2
	AETR	*Aegilops triuncialis*	33.3	0.1	0.2	0.2
	ERIOG	*Eriogonum*	33.3	0.1	0.2	0.2
	GADIP	*Gayophytum diffusum* subsp. *parviflorum*	33.3	0.1	0.2	0.2
	HIIN3	*Hirschfeldia incana*	33.3	0.1	0.2	0.2
	LICI	*Linanthus ciliatus*	33.3	0.1	0.2	0.2
	VUMI	*Vulpia microstachys*	33.3	0.1	0.2	0.2

***Forestiera pubescens* Alliance (Desert Olive)**

ASSOCIATIONS
Forestiera pubescens-Sambucus mexicana

LOCAL VEGETATION DESCRIPTION
Stands of *Forestiera pubescens* Shrubland form an open to continuous shrub layer (25-78%, mean 60.8%), where *Forestiera pubescens* dominates. Shrubs infrequently occur in two different strata, with low shrubs at 1-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is open (1-2%, mean 1.5%) at 0-1m tall. Emergent trees occur frequently (1-12%, mean 7.5%) at 5-15m tall. Total vegetation cover is 26-85% (mean 67.5%).

In the ***Forestiera pubescens-Salix* spp. Association,** *Forestiera pubescens* consistently dominates in the shrub layer in dense patches, and *Sambucus mexicana* is consistently present at trace cover. *Salix laevigata* and/or *Salix gooddingii* are present in the tree overstory/understory. Native herbs may include *Leymus condensatus* and *Sarcostemma cynanchoides* var. *hartwegii*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,864-1,974 ft., mean 1,938 ft.
Aspect: variable
Slope: gentle, range 1-3 degrees, mean 1.5 degrees
Topography: more often flat, less often undulating, bottom slopes
Litter Cover: range 80-88%, mean 84%
Rock Cover: 0%, mean 0%
Bare ground: range 1-15%, mean 6%
Parent Material: sandy alluvium and Mesozoic granite
Soil Texture: more often medium to very fine sandy loam, less often coarse sand

The *Forestiera pubescens* Alliance was sampled in the central portion of the study area in the Perris Valley and Hills (M262Bk) and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections. It is a riparian type occurring in washes where the *Salix* is scattered in an overstory over dense *Forestiera*.

Samples used to describe alliance: (n=4) WRIV0122, WRIV0418, WRIV0421, WRIV0428

RANK: G4 S4 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: South Coast and Peninsular Ranges (Western Riverside County: Perris Valley and Hills and San Jacinto Foothills – Cahuilla Mountains Subsections), Mojave Desert, though full distribution is not known

REFERENCES
Thomas et al. 2004

***Forestiera pubescens* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	SALA3-t	*Salix laevigata*	75	5.8	1	12
	QUAG-t	*Quercus agrifolia*	25	0.5	2	2
Tree Understory	SAGO-m	*Salix gooddingii*	25	1.3	5	5
	QUAG-m	*Quercus agrifolia*	25	0.1	0.2	0.2
Shrub	FOPU2	*Forestiera pubescens*	100	59	20	78
	SAME5	*Sambucus mexicana*	100	0.9	0.2	3
	ERFA2	*Eriogonum fasciculatum*	50	0.8	0.2	3
	BASA4	*Baccharis salicifolia*	25	0.3	1	1
	GUCA	*Gutierrezia californica*	25	0.3	1	1
	LOSC2	*Lotus scoparius*	25	0.3	1	1
	ADFA	*Adenostoma fasciculatum*	25	0.1	0.2	0.2
	JUCA7	*Juniperus californica*	25	0.1	0.2	0.2
Herb	LECO12	*Leymus condensatus*	50	0.3	0.2	1
	SACYH	*Sarcostemma cynanchoides* var. *hartwegii*	25	0.1	0.2	0.2

***Heteromeles arbutifolia* Alliance (Toyon)**

ASSOCIATIONS
Heteromeles arbutifolia-Artemisia californica
Heteromeles arbutifolia-Quercus berberidifolia-Cercocarpus betuloides-Fraxinus dipetala

LOCAL VEGETATION DESCRIPTION
Stands of *Heteromeles arbutifolia* Shrubland form an open to continuous shrub layer (15-78%, mean 56.6%), where *Heteromeles arbutifolia* can dominate or co-dominate with diverse mixtures of coastal sage scrub and chaparral shrubs. The shrub layer is frequently in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-5m tall. Emergent trees occur infrequently (0.2% cover, mean 0.2%) at 5-10m tall, including *Quercus agrifolia* and *Cupressus forbesii*. The herbaceous layer is open to intermittent (0.2-50%, mean 8.4%) at 0-1m tall, and it may include native *Melica imperfecta*, and non-natives *Bromus madritensis*, *Avena* spp., and *Hirschfeldia incana*. Total vegetation cover is 29-78% (mean 63.3%).

In the ***Heteromeles arbutifolia-Artemisia californica* Association,** *Artemisia californica* co-dominates with *Heteromeles arbutifolia* in the shrub overstory, while *Cercocarpus betuloides*, *Salvia mellifera*, *Rhus ovata*, *Malosma laurina*, and *Keckiella antirrhinoides* may be present.

In the ***Heteromeles arbutifolia-Quercus berberidifolia-Cercocarpus betuloides-Fraxinus dipetala* Association,** *Heteromeles arbutifolia* dominates or co-dominates in the intermittent to continuous shrub layer. *Quercus berberidifolia*, *Fraxinus dipetala*, and *Cercocarpus betuloides* are characteristically present as co-dominant or sub-dominant shrubs, while *Artemisia californica*, *Malosma laurina*, and *Prunus ilicifolia* may be present. In this association, *Quercus berberidifolia* is co-dominant or sub-dominant with *Heteromeles arbutifolia*, however, in the *Quercus berberidifolia-Fraxinus dipetala-Heteromeles arbutifolia* Association, *Quercus berberidifolia* is dominant and *Heteromeles arbutifolia* is sub-dominant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,272-3,362 ft., mean 2,486 ft.
Aspect: more often NE and NW, less often SE
Slope: moderate to steep, range 8-42 degrees, mean 29.5 degrees
Topography: variable, but more often undulating, lower to top slopes
Litter Cover: range 8-70%, mean 34.3%
Rock Cover: range 4.2-70%, mean 25.2%
Bare ground: range 2-75%, mean 35.6%
Parent Material: more often sedimentary, less often metavolcanic or Mesozoic granite
Soil Texture: varies from moderately coarse sandy loam to loam

The *Heteromeles arbutifolia* Alliance was sampled in the Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections, usually on north-trending or neutral slopes primarily at lower elevations.

Samples used to describe alliance: (n=15) WRIV0013, WRIV0019, WRIV0021, WRIV0212, WRIV0216, WRIV0222, WRIV0247, WRIV0248, WRIV0249, WRIV0287, WRIV0293, WRIV0295, WRIV0300, WRIV0389, WRIV0395

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: South Coast, Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (Western Riverside County), Sierra Nevada foothills (Tuolumne County), though full distribution is not known

Heteromeles arbutifolia-Artemisia californica Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known

Heteromeles arbutifolia-Quercus berberidifolia-Cercocarpus betuloides-Fraxinus dipetala Association: South Coast and Peninsular Ranges (Western Riverside County: Santa Ana Mountains and Perris Valley and Hills Subsections), though full distribution is not known

REFERENCES

CNPS and CDFG 2005b, Evens et al. 2004

***Heteromeles arbutifolia* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	HEAR5	*Heteromeles arbutifolia*	100	14.5	4	24
	RHOV	*Rhus ovata*	80	2.8	0.2	16
	ARCA11	*Artemisia californica*	73.3	9	0.2	30
	CEBE3	*Cercocarpus betuloides*	73.3	6.1	0.2	33
	QUBE5	*Quercus berberidifolia*	60	6.6	0.2	45
	MALA6	*Malosma laurina*	60	2.6	0.2	16
	ERFA2	*Eriogonum fasciculatum*	53.3	1.2	0.2	5
	FRDI2	*Fraxinus dipetala*	46.7	5.8	2	18
	SAME3	*Salvia mellifera*	46.7	2.7	1	28
	CECR	*Ceanothus crassifolius*	46.7	1.8	0.2	17
	LOSU2	*Lonicera subspicata*	46.7	1.1	0.2	5
	RHIL	*Rhamnus ilicifolia*	46.7	0.8	0.2	5
	PRIL	*Prunus ilicifolia*	40	0.8	0.2	5
	ADFA	*Adenostoma fasciculatum*	33.3	0.4	0.2	3
	KEAN	*Keckiella antirrhinoides*	26.7	1.3	2	10
	ERCO25	*Eriophyllum confertiflorum*	26.7	0.5	1	3
	RHCR	*Rhamnus crocea*	20	0.1	0.2	1
	SAAP2	*Salvia apiana*	20	0.1	0.2	1
Herb	BRMA3	*Bromus madritensis*	26.7	2.9	1	27
Cryptogam	MOSS	Moss	20	2.1	0.2	16

***Juniperus californica* Alliance (California Juniper)**

ASSOCIATIONS
Juniperus californica/Annual Grass-Herb
Juniperus californica-Adenostoma fasciculatum-Eriogonum fasciculatum
Juniperus californica-Eriogonum fasciculatum-Artemisia californica

LOCAL VEGETATION DESCRIPTION
Stands of *Juniperus californica* Shrubland form an open to intermittent shrub layer (3-51%, mean 27.7%), where *Juniperus californica* usually dominates or co-dominates with smaller stature shrubs. The shrub layer is frequently in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to continuous (10-85%, mean 41.1%) at 0-2m tall. Emergent trees occur infrequently (6% cover, mean 6%) at 5-10m tall and may include *Salix gooddingii*, *Salix laevigata*, or *Schinus molle*. Total vegetation cover is 27-90% (mean 63.9%).

In the ***Juniperus californica*/Annual Grass-Herb Association,** *Juniperus californica* occurs at sparse to moderate cover in the shrub overstory. Other shrub species (e.g., *Opuntia parryi*, *Eriogonum fasciculatum*, and *Ericameria palmeri*) frequently intermix at sparse cover. A variety of annual grasses and forbs occupy the open to continuous herb understory, the most common being native *Hemizonia fasciculata* and non-natives *Bromus madritensis*, *Bromus diandrus*, *Hirschfeldia incana*, and *Avena fatua*.

In the ***Juniperus californica-Adenostoma fasciculatum-Eriogonum fasciculatum* Association,** *Adenostoma fasciculatum* and *Eriogonum fasciculatum* are consistently present as co-dominant or sub-dominant shrubs. Shrubs *Quercus berberidifolia*, *Gutierrezia sarothrae*, *Opuntia parryi*, and *Ericameria palmeri* var. *pachylepis* are often present at sparse cover.

In the ***Juniperus californica-Eriogonum fasciculatum-Artemisia californica* Association,** *Eriogonum fasciculatum* and *Artemisia californica* are characteristically present as sub-dominant shrubs. *Lessingia filaginifolia* is commonly present at sparse cover. A variety of native and non-native species occupy the herb understory in associations of the *Juniperus californica* Alliance (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,313-3,515 ft., mean 1,777 ft.
Aspect: variable
Slope: gentle to somewhat steep, range 2-18 degrees, mean 7.1 degrees
Topography: undulating or concave, bottom to top slopes
Litter Cover: range 3-85%, mean 29.6%
Rock Cover: range 0-68%, mean 20.2%
Bare ground: range 7-70%, mean 39.8%
Parent Material: more often Mesozoic granite, less often gabbro and diorite, sedimentary, mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, but varies from sand to moderately fine silty clay loam

The *Juniperus californica* Alliance was sampled in the Perris Valley and Hills (M262Bk) and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections on relatively gentle to moderate slopes of variable topography. Sampling sites were located in or near Lake Matthews, Harford Springs, Anza-Borrego Desert State Park, and Canyon Lake.

Samples used to describe alliance: (n=18) WRAA.116, WRAA.117, WRAA.118, WRAA.119, WRAA.121, WRIV0420, WRIV0422, WRIV0423, WRIV0424, WRIV0425, WRIV0430, WRIV0431, WRIV0450, WRIV0537, WRIV0555, WRIV0630, WRIV0660, WRIV1023

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: inner Central and South Coasts (including San Benito and western Fresno Counties), montane Transverse Ranges and Peninsular Ranges (including San Bernardino Mountains and San Jacinto foothills, Western Riverside County: Perris Valley and Hills), Mojave Desert, Anza-Borrego Desert, Baja CA.

Juniperus californica/Annual Grass-Herb Association: inner South Coast: (Western Riverside County: Perris Valley and Hills), though full distribution is not known
Juniperus californica-Adenostoma fasciculatum-Eriogonum fasciculatum Association: inner South Coast: (Western Riverside County: Perris Valley and Hills), though full distribution is not known
Juniperus californica-Eriogonum fasciculatum-Artemisia californica Association: inner South Coast: (Western Riverside County: Perris Valley and Hills), though full distribution is not known

REFERENCES
CDFG 1998, CNPS and CDFG 2005a, Minnich 1976, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004, Vogl 1976

***Juniperus californica* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	JUCA7	*Juniperus californica*	100	18.6	1	49
	ERFA2	*Eriogonum fasciculatum*	66.7	1.9	0.2	9
	OPPA2	*Opuntia parryi*	55.6	0.3	0.2	2
	ADFA	*Adenostoma fasciculatum*	38.9	3.9	1	21
	ARCA11	*Artemisia californica*	33.3	0.6	0.2	4
	QUBE5	*Quercus berberidifolia*	22.2	0.5	0.2	8
	ERPAP	*Ericameria palmeri* var. *pachylepis*	22.2	0	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	55.6	7.8	2	30
	ERCI6	*Erodium cicutarium*	44.4	2.8	2	18
	HIIN3	*Hirschfeldia incana*	44.4	2	1	17
	BRDI3	*Bromus diandrus*	33.3	3.3	2	15
	ERODI	*Erodium*	27.8	5.1	4	42
	HEFA	*Hemizonia fasciculata*	27.8	2.3	0.2	29
	AVFA	*Avena fatua*	27.8	2.1	2	15
	AMME	*Amsinckia menziesii*	27.8	0.5	0.2	5
	LEFI11	*Lessingia filaginifolia*	27.8	0.2	0.2	2
	CRYPT	*Cryptantha*	22.2	0.3	0.2	3
	SCBA	*Schismus barbatus*	16.7	0.8	4	6
	PLAGI	*Plagiobothrys*	16.7	0.2	0.2	2
	LACA7	*Lasthenia californica*	16.7	0.1	0.2	1

***Keckiella antirrhinoides* Alliance (Bush Penstemon)**

ASSOCIATIONS
Keckiella antirrhinoides
Keckiella antirrhinoides-Artemisia californica
Keckiella antirrhinoides-Eriogonum fasciculatum
Keckiella antirrhinoides-Mixed Chaparral

LOCAL VEGETATION DESCRIPTION
Stands of *Keckiella antirrhinoides* Shrubland form an open to continuous shrub layer (19-75%, mean 43.9%), where *Keckiella antirrhinoides* usually dominates or co-dominates with other shrubs. The shrub layer is often in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (2-60%, mean 21.1%) at 0-1m tall, including a variety of native and non-native species (see species table). Total vegetation cover is 21-90% (mean 59.4%).

In the ***Keckiella antirrhinoides* Association,** *Keckiella antirrhinoides* dominates in the intermittent shrub layer, while other species (e.g., *Eriodictyon crassifolium*, *Eriogonum fasciculatum*, and *Tetradymia comosa*) are often present at low cover. A variety of annual grasses and forbs occupy the open to intermittent herb understory, the most common being non-native grass *Bromus madritensis*.

In the ***Keckiella antirrhinoides-Artemisia californica* Association,** both shrub species are consistently present and are often co-dominant, though either species may be sub-dominant to the other. *Eriogonum fasciculatum* and *Rhus ovata* often intermix in the shrub overstory and may be sub-dominant or co-dominant.

In the ***Keckiella antirrhinoides-Eriogonum fasciculatum* Association,** both shrub species are consistently present and *Eriogonum fasciculatum* is either co-dominant or sub-dominant. The most common sub-dominant shrubs are *Salvia apiana* and *Rhus ovata*.

In the ***Keckiella antirrhinoides*-Mixed Chaparral Association,** *Adenostoma fasciculatum* is consistently present as a co-dominant or sub-dominant shrub with *Keckiella antirrhinoides*. A variety of other shrubs intermix at low cover, the most frequent species being *Eriogonum fasciculatum*, *Rhus ovata*, *Quercus berberidifolia*, and *Eriodictyon crassifolium*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 885-3,693 ft., mean 1,861 ft.
Aspect: usually NW or NE, infrequently SE, SW, or variable
Slope: moderate to steep, range 9-45 degrees, mean 24.7 degrees
Topography: variable, but more often undulating or convex, lower to top slopes
Litter Cover: range 7-65%, mean 26.8%
Rock Cover: range 5-79%, mean 33.3%
Bare ground: range 0.2-85%, mean 35.4%
Parent Material: more often Mesozoic granite or sedimentary, less often alluvium, mixed granitic and metamorphic, gabbro and diorite, metavolcanic
Soil Texture: more often medium to very fine sandy loam, but varies from medium sand to clay

The *Keckiella antirrhinoides* Alliance was sampled in the Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections at low to middle elevations that often are north-trending. This alliance appears to occur at the interface between coastal sage scrub and chaparral vegetation types.

Samples used to describe alliance: (n=35) WRAA.091, WRAA.100, WRAA.125, WRAA.151, WRAA.154, WRAA.159, WRAA.168, WRIV0004, WRIV0097, WRIV0189, WRIV0194, WRIV0200, WRIV0201, WRIV0210, WRIV0238, WRIV0239, WRIV0373, WRIV0429, WRIV0478, WRIV0495, WRIV0529, WRIV0551, WRIV0552, WRIV0559, WRIV0566, WRIV0579, WRIV0580, WRIV0589, WRIV0590, WRIV0664, WRIV0688, WRIV0833, WRIV0952, WRIV0959, WRIV0999

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: Peninsular Ranges (Western Riverside County: Santa Ana and San Jacinto Mountains; San Diego County: western foothills), South Coast (coastal hills and valleys in Western Riverside and San Diego Counties)

Keckiella antirrhinoides Association: South Coast and Peninsular Ranges (Western Riverside and San Diego Counties)
Keckiella antirrhinoides-Artemisia californica Association: distribution same as alliance
Keckiella antirrhinoides-Eriogonum fasciculatum Association: distribution same as alliance
Keckiella antirrhinoides-Mixed chaparral Association: South Coast and Peninsular Ranges (Western Riverside County: Perris Valley and Hills and San Jacinto Foothills; San Diego County: western foothills)

REFERENCES
Evens and San In publication, Gordon and White 1994

***Keckiella antirrhinoides* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	KEAN	*Keckiella antirrhinoides*	100	22.1	7	57
	ERFA2	*Eriogonum fasciculatum*	88.6	6.4	0.2	26
	ARCA11	*Artemisia californica*	57.1	5.9	0.2	45
	SAAP2	*Salvia apiana*	45.7	0.8	0.2	10
	RHOV	*Rhus ovata*	42.9	2.5	0.2	26
	ADFA	*Adenostoma fasciculatum*	34.3	2.7	0.2	35
	SAME3	*Salvia mellifera*	31.4	1.1	0.2	16
	YUWH	*Yucca whipplei*	20	0.2	0.2	2
Herb	BRMA3	*Bromus madritensis*	77.1	4.4	0.2	17
	HIIN3	*Hirschfeldia incana*	31.4	1.3	0.2	26
	EUCH	*Eucrypta chrysanthemifolia*	25.7	2	1	20
	AMME	*Amsinckia menziesii*	25.7	0.4	0.2	7
	MAMA8	*Marah macrocarpus*	22.9	0.4	0.2	3

***Lepidospartum squamatum* Alliance (Scalebroom)**

ASSOCIATIONS
Lepidospartum squamatum/*Amsinckia menziesii*
Lepidospartum squamatum-Atriplex canescens
Lepidospartum squamatum-Baccharis salicifolia
Lepidospartum squamatum-Eriogonum fasciculatum

LOCAL VEGETATION DESCRIPTION

Stands of *Lepidospartum squamatum* Shrubland form an open to intermittent shrub layer (10-43%, mean 21.4%), where *Lepidospartum squamatum* dominates or is characteristically present. The shrub layer is frequently in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (1-65%, mean 20.6%) at 0-5m tall, and includes a variety of native and non-native species (see species table). Emergent trees occur infrequently at trace cover (0.2-3% cover, mean 1.7%) at 5-10m tall, and may include *Populus fremontii*, *Salix laevigata*, *Salix lucida*, or *Platanus racemosa*. Total vegetation cover is 11-70%, (mean 38.9%).

In the ***Lepidospartum squamatum*/*Amsinckia menziesii* Association,** *Lepidospartum squamatum* is consistently present as a dominant shrub. *Eriogonum fasciculatum*, *Eriodictyon crassifolium*, *Opuntia parryi*, *Sambucus mexicana* and non-native *Nicotiana glauca* occasionally intermix at sparse cover. A diverse mixture of native and non-native herbs comprise the understory, including native species *Amsinckia menziesii* and *Pectocarya linearis*, and non-native species *Erodium cicutarium*, *Bromus madritensis*, and *Schismus barbatus*.

In the ***Lepidospartum squamatum-Atriplex canescens* Association,** *Atriplex canescens* is co-dominant or sub-dominant with *Lepidospartum squamatum*. A variety of other shrub species (e.g., *Sambucus mexicana*, *Eriogonum fasciculatum*, *Atriplex polycarpa*, *Prunus ilicifolia*, *Rhus ovata*) may intermix at sparse cover.

In the ***Lepidospartum squamatum-Baccharis salicifolia* Association,** both shrub species are consistently present at low cover. Other dessert shrub species intermix at sparse cover, the most common being *Eriogonum fasciculatum*.

In the ***Lepidospartum squamatum-Eriogonum fasciculatum* Association,** *Eriogonum fasciculatum* is consistently present at low cover in the open to intermittent shrub canopy. Additional shrub species often include *Opuntia parryi* and *Sambucus mexicana*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 968-3,828 ft., mean 2,372 ft.
Aspect: flat to mildly SW, NW and SE
Slope: flat to gentle, range 0-3 degrees, mean 1.4 degrees
Topography: more often flat, less often concave, bottom to mid slopes
Litter Cover: range 0-20%, mean 7.9%
Rock Cover: range 25-99%, mean 64.5%
Bare ground: range 0-60%, mean 23.4%
Parent Material: Mesozoic granite, sandy alluvium, sedimentary
Soil Texture: varies from coarse sand to very fine sandy loam

The *Lepidospartum squamatum* Alliance was sampled in the Fontana Plain - Calimesa Terraces (M262Bj, Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections within intermittently flooded washes and alluvial fans.

Samples used to describe alliance: (n=14) WRIV0027, WRIV0048, WRIV0100, WRIV0457, WRIV0481, WRIV0536, WRIV0550, WRIV0563, WRIV0685, WRIV0691, WRIV0692, WRIV0945, WRIV0949, WRIV0980

RANK: G3 S3 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: southern Sierra Nevada Foothills, inner Central Coast, South Coast and Peninsular Ranges (including Western Riverside County), Transverse Ranges (including Ventura, Los Angeles and San Bernardino Counties), Mojave and Colorado Deserts (including Anza-Borrego Desert)

Lepidospartum squamatum/*Amsinckia menziesii* Association: South Coast and Peninsular Ranges (Western Riverside County: Perris Valley and Hills and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known
Lepidospartum squamatum-Atriplex canescens Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains Subsection), though full distribution is not known
Lepidospartum squamatum-Baccharis salicifolia Association: South Coast and Peninsular Ranges (Western Riverside County: Perris Valley and Hills, Fontana Plain - Calimesa Terraces, and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known
Lepidospartum squamatum-Eriogonum fasciculatum Association: montane Transverse Ranges (including Los Angeles and San Bernardino Counties), South Coast and Peninsular Ranges (including Western Riverside County: Fontana Plain and San Jacinto Foothills - Cahuilla Mountains Subsections)

REFERENCES
Barbour and Wirka 1997, CDFG 1998, CNPS and CDFG 2005b, Gordon and White 1994, Sawyer and Keeler-Wolf 1995

***Lepidospartum squamatum* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	LESQ	*Lepidospartum squamatum*	100	10.8	1	25
	ERFA2	*Eriogonum fasciculatum*	64.3	2.7	0.2	14
	SAME5	*Sambucus mexicana*	64.3	1.7	0.2	17
	BASA4	*Baccharis salicifolia*	35.7	1.4	0.2	11
	OPPA2	*Opuntia parryi*	35.7	1.4	0.2	11
	LOSC2	*Lotus scoparius*	35.7	0.5	0.2	3
	ATCA2	*Atriplex canescens*	21.4	0.5	0.2	6
	PRIL	*Prunus ilicifolia*	21.4	0.3	0.2	2
	SEFL3	*Senecio flaccidus*	21.4	0.3	0.2	2
	NIGL	*Nicotiana glauca*	21.4	0	0.2	0.2
	SAAP2	*Salvia apiana*	21.4	0	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	71.4	2.5	0.2	8
	HIIN3	*Hirschfeldia incana*	57.1	1	0.2	5
	AMME	*Amsinckia menziesii*	42.9	1.3	0.2	7
	BRTE	*Bromus tectorum*	35.7	2.1	0.2	14
	ERCI6	*Erodium cicutarium*	35.7	1.8	1	8
	SCBA	*Schismus barbatus*	35.7	1.4	1	10
	BRDI3	*Bromus diandrus*	28.6	1.6	3	12
	CAMIS	*Camissonia*	21.4	0.4	0.2	5
	PELI	*Pectocarya linearis*	21.4	0.4	0.2	5
	ARDR4	*Artemisia dracunculus*	21.4	0	0.2	0.2
	LEFI11	*Lessingia filaginifolia*	21.4	0	0.2	0.2

***Lotus scoparius* Alliance (Deerweed)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Lotus scoparius* Shrubland form an open shrub layer (25-26%, mean 25.3%), where *Lotus scoparius* dominates or co-dominates. The shrub layer is often in two different strata, with low shrubs at 0.5-1m tall and tall shrubs at 01-2m tall. The herbaceous layer is open to continuous (3-78%, mean 52%) at 0-0.5m tall and includes a variety of native and non-native annual grasses and herbs (see species table). Total vegetation cover is 27-83% (mean 63.3%).

In the ***Lotus scoparius* Alliance**, *Lotus scoparius* is consistently present in the open shrub overstory at low cover. Other shrubs that may be present at low cover include *Lessingia filaginifolia, Rhus ovata,* and *Eriogonum fasciculatum*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 2,031-3,320 ft., mean 2,594 ft.
Aspect: variable
Slope: moderate to somewhat steep, range 10-26 degrees, mean 18.7 degrees
Topography: variable, lower to top slopes
Litter Cover: range 0-30%, mean 11.7%
Rock Cover: range 26-70%, mean 47.3%
Bare ground: range 25-50%, mean 40%
Parent Material: Mesozoic granite, alluvium
Soil Texture: varies from sand to very fine sandy loam

The *Lotus scoparius* Alliance was sampled in the Perris Valley and Hills (M262Bk) and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections at lower elevations on well-drained soils that have been recently disturbed (e.g., clearing, burning).

Samples used to describe alliance: (n=3) WRIV0062, WRIV0483, WRIV0486

RANK: G5 S5 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: Central Coast (including San Benito County), western Transverse Ranges (including Santa Monica Mountains), South Coast and Peninsular Ranges (including Ventura, Western Riverside, and San Diego Counties), Anza-Borrego Desert, Sierra Nevada foothills (J. Evens, personal observation)

REFERENCES
CDFG 1998, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San In publication, White 1994

***Lotus scoparius* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	LOSC2	*Lotus scoparius*	100	16.7	14	21
	ERFA2	*Eriogonum fasciculatum*	66.7	0.4	0.2	1
	RHOV	*Rhus ovata*	66.7	0.4	0.2	1
	ENAC	*Encelia actoni*	33.3	4	12	12
	ADSP	*Adenostoma sparsifolium*	33.3	0.3	1	1
	CECU	*Ceanothus cuneatus*	33.3	0.1	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	66.7	12.7	1	37
	ERCI6	*Erodium cicutarium*	66.7	10	15	15
	SCBA	*Schismus barbatus*	66.7	6.7	10	10
	LEFI11	*Lessingia filaginifolia*	66.7	4.7	4	10
	AMME	*Amsinckia menziesii*	66.7	3	2	7
	CRIN8	*Cryptantha intermedia*	66.7	2.7	2	6
	HIIN3	*Hirschfeldia incana*	66.7	2	1	5
	PLCO13	*Plagiobothrys collinus*	33.3	8.3	25	25
	PELI	*Pectocarya linearis*	33.3	3	9	9
	TRGR5	*Tropidocarpum gracile*	33.3	0.7	2	2
	BRTE	*Bromus tectorum*	33.3	0.3	1	1
	CACI2	*Calandrinia ciliata*	33.3	0.3	1	1
	EUCH	*Eucrypta chrysanthemifolia*	33.3	0.3	1	1

***Lycium andersonii* Alliance (Anderson Boxthorn)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Lycium andersonii* Shrubland form an intermittent shrub layer (37-60%, mean 46.3%), where *Lycium andersonii* dominates. Shrubs consistently occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is open to intermittent (7-62%, mean 31%) at 0-1m tall. Total vegetation cover is 64-88% (mean 73%).

Lycium andersonii dominates in small stands adjacent to other desert-transition vegetation. Shrubs that are consistently present as sub-dominants include *Eriogonum fasciculatum*, *Juniperus californica*, *Artemisia californica*, *Encelia californica*, *Ericameria palmeri* and *Sambucus mexicana*. Mixed native and non-native annuals occupy the herb understory.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,413-1,477 ft., mean 1,437 ft.
Aspect: SW and NW
Slope: gentle, range 3-5 degrees, mean 4 degrees
Topography: convex or undulating, lower slopes
Litter Cover: range 10-27%, mean 16.3%
Rock Cover: range 5-16%, mean 12%
Bare ground: range 63-75%, mean 68.7%
Parent Material: Mesozoic granite, gabbro and diorite
Soil Texture: medium loam, medium to very fine sandy loam

The *Lycium andersonii* Alliance was sampled only in the Perris Valley and Hills (M262Bk) Subsection, including the Lake Matthews region.

Samples used to describe alliance: (n=3) WRIV0627, WRIV0628, WRIV0638

Plots Sampled: 3
WRIV0627, WRIV0628, WRIV0638

RANK: G4 S4 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: inner South Coast (Western Riverside County: Perris Valley and Hills), though full distribution is not known

REFERENCES
Thomas et al. 2004

***Lycium andersonii* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	LYAN	*Lycium andersonii*	100	39.7	29	56
	ERFA2	*Eriogonum fasciculatum*	100	1.7	0.2	4
	ENCA	*Encelia californica*	66.7	4.7	0.2	14
	JUCA7	*Juniperus californica*	66.7	4.7	3	11
	ERPAP	*Ericameria palmeri* var. *pachylepis*	66.7	1	1	2
	GUCA	*Gutierrezia californica*	66.7	1	1	2
	SAME5	*Sambucus mexicana*	66.7	0.7	0.2	2
	ARCA11	*Artemisia californica*	66.7	0.4	0.2	1
	OPPA2	*Opuntia parryi*	66.7	0.1	0.2	0.2
	ENFA	*Encelia farinosa*	33.3	0.1	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	100	23	5	53
	SCBA	*Schismus barbatus*	100	2.7	0.2	7
	ERCI6	*Erodium cicutarium*	66.7	5.3	6	10
	AMME	*Amsinckia menziesii*	66.7	1	1	2
	LACA7	*Lasthenia californica*	66.7	1	1	2
	BRDI3	*Bromus diandrus*	33.3	4	12	12
	CRCO34	*Crassula connata*	33.3	3	9	9
	ERODI	*Erodium*	33.3	1.3	4	4
	HOMA2	*Hordeum marinum*	33.3	1.3	4	4
	STGN	*Stylocline gnaphaloides*	33.3	1.3	4	4
	PTDR	*Pterostegia drymarioides*	33.3	1	3	3
	CHAL11	*Chamaesyce albomarginata*	33.3	0.7	2	2
	URUR	*Urtica urens*	33.3	0.7	2	2
	HIIN3	*Hirschfeldia incana*	33.3	0.3	1	1
	CRYPT	*Cryptantha*	33.3	0.1	0.2	0.2
	DICA14	*Dichelostemma capitatum*	33.3	0.1	0.2	0.2
	LAAU	*Lamarckia aurea*	33.3	0.1	0.2	0.2
	LEFI11	*Lessingia filaginifolia*	33.3	0.1	0.2	0.2
	MICA6	*Mirabilis californica*	33.3	0.1	0.2	0.2
	SATR12	*Salsola tragus*	33.3	0.1	0.2	0.2
	VUMY	*Vulpia myuros*	33.3	0.1	0.2	0.2
Cryptogam	LICHEN	Lichen	33.3	13	39	39
	MOSS	Moss	33.3	3.3	10	10

***Malacothamnus fasciculatus* Alliance (Chaparral Mallow)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Malacothamnus fasciculatus* Shrubland form an open shrub layer (12-33%, mean 22.5%), where *Malacothamnus fasciculatus* dominates. Shrubs consistently occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (1-35%, mean 18%) at 0-0.5m tall. Total vegetation cover is 33-45% (mean 39%).

In the ***Malacothamnus fasciculatum* Alliance**, a variety of chaparral and coastal sage species (e.g., *Ceanothus crassifolius*, *Salvia mellifera, Ceanothus tomentosus, Adenostoma fasciculatum, Lotus scoparius, Eriogonum fasciculatum*) intermix in the shrub layer at sparse cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,879-2,583 ft., mean 2,231 ft.
Aspect: NW
Slope: steep, 30 degrees, mean 30 degrees
Topography: convex or undulating, lower to top slopes
Litter Cover: range 1-3%, mean 2%
Rock Cover: range 24-30%, mean 27%
Bare Ground: 65%, mean 65%
Parent Material: Mesozoic granite, mixed granitic and metamorphic
Soil Texture: medium to very fine sandy loam, medium loam

The *Malacothamnus fasciculatus* Alliance was sampled only in the Perris Valley and Hills (M262Bk) Subsection at low elevations in relatively steep slopes in areas within coastal sage scrub and chaparral that have been burned within the last 10-20 years.

Samples used to describe alliance: (n=2) WRIV0020, WRIV0444

RANK: G4 S4 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: western Transverse Ranges (including Santa Monica Mountains), inner South Coast (Western Riverside County: Perris Valley and Hills), though full distribution is not known

REFERENCES
CNPS and CDFG 2005b

***Malacothamnus fasciculatus* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	MAFA	*Malacothamnus fasciculatus*	100	14	10	18
	CECR	*Ceanothus crassifolius*	50	3	6	6
	SAME3	*Salvia mellifera*	50	3	6	6
	CETO	*Ceanothus tomentosus*	50	1.5	3	3
	ADFA	*Adenostoma fasciculatum*	50	0.5	1	1
	ERFA2	*Eriogonum fasciculatum*	50	0.5	1	1
	LOSC2	*Lotus scoparius*	50	0.5	1	1
	ARCA11	*Artemisia californica*	50	0.1	0.2	0.2
	BEJU	*Bebbia juncea*	50	0.1	0.2	0.2
	BRCA3	*Brickellia californica*	50	0.1	0.2	0.2
	ENFA	*Encelia farinosa*	50	0.1	0.2	0.2
	TODI	*Toxicodendron diversilobum*	50	0.1	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	100	5.5	1	10
	BRDI3	*Bromus diandrus*	50	7.5	15	15
	HIIN3	*Hirschfeldia incana*	50	1.5	3	3
	CRYPT	*Cryptantha*	50	1	2	2
	ERCI6	*Erodium cicutarium*	50	1	2	2
	MAMA8	*Marah macrocarpus*	50	1	2	2
	MICA6	*Mirabilis californica*	50	0.5	1	1

***Malosma laurina* Alliance (Laurel Sumac)**

ASSOCIATIONS
Malosma laurina-Eriogonum fasciculatum
Malosma laurina-Eriogonum fasciculatum-Salvia apiana
Malosma laurina-Eriogonum fasciculatum-Salvia mellifera
Malosma laurina-Tetracoccus dioicus

LOCAL VEGETATION DESCRIPTION
Stands of *Malosma laurina* Shrubland form an open to intermittent shrub layer (25-65%, mean 42.8%), where *Malosma laurina* dominates or co-dominates with *Eriogonum fasciculatum*. Shrubs consistently occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (0.2-35%, mean 16.5%) at 0-1m tall, and includes a variety of native and non-native species (see species table). Total vegetation cover is 33-80% (mean 55.8%).

In the ***Malosma laurina-Eriogonum fasciculatum* Association,** both species are co-dominant in the shrub overstory. *Salvia apiana*, *Ceanothus leucodermis*, *Heteromeles arbutifolia*, *Baccharis pilularis*, and *Baccharis salicifolia* are examples of species that may occur as shrubs at low cover.

In the ***Malosma laurina-Eriogonum fasciculatum-Salvia apiana* Association,** *Malosma laurina* and *Eriogonum* are co-dominant, and *Salvia apiana* may be co-dominant or sub-dominant. The shrub layer may include other species at low cover, such as *Artemisia californica* and *Yucca whipplei*.

In the ***Malosma laurina-Eriogonum fasciculatum-Salvia mellifera* Association,** all three shrubs are usually co-dominant. Other chaparral and coastal sage species that are characteristically present at low cover include *Heteromeles arbutifolia*, *Artemisia californica*, *Adenostoma fasciculatum*, and *Yucca whipplei*.

In the ***Malosma laurina-Tetracoccus dioicus* Association,** *Malosma laurina* co-occurs with the rare plant, *Tetracoccus dioicus*. *Artemisia californica*, *Eriogonum fasciculatum*, *Yucca whipplei*, and *Salvia apiana* are examples of other shrubs that may be present.

Romneya coulteri, a CNPS List 4 species (CNPS 2005), was found in 2 of 13 surveys of the *Malosma laurina* Alliance. See Appendix 3 for more information on this plant.

Tetracoccus dioicus, a CNPS List 1B species (CNPS 2005), was found in 2 of 13 surveys of the *Malosma laurina* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 769-2,949 ft., mean 1,716 ft.
Aspect: all aspects
Slope: gentle to abrupt, range 1-80 degrees, mean 30.8 degrees
Topography: variable, but more often undulating, bottom to top slopes
Litter Cover: range 5-51%, mean 27.2%
Rock Cover: range 18-83%, mean 44.8%
Bare ground: range 1-48%, mean 24%
Parent Material: Mesozoic granite, sedimentary, gabbro and diorite, volcanic
Soil Texture: varies from coarse loamy sand to clay

The *Malosma laurina* Alliance was sampled in the Santa Ana Mountains (M262Bf) and Fontana Plain - Calimesa Terraces (M262Bj) Subsections at low elevations in variable substrate and topography.

Samples used to describe alliance: (n=13) WRAA.053, WRAA.103, WRAA.108, WRIV0220, WRIV0254, WRIV0275, WRIV0276, WRIV0301, WRIV0354, WRIV0392, WRIV0402, WRIV0596, WRIV0644

RANK: G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: outer South Coast (including coastal hills of Ventura, Western Riverside, and San Diego Counties), Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (including Western Riverside and San Diego Counties), Baja California

Malosma laurina-Eriogonum fasciculatum Association: South Coast (Ventura County), Peninsular Ranges (San Diego County: western foothills; Western Riverside County: Santa Ana Mountains)
Malosma laurina-Eriogonum fasciculatum-Salvia apiana Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains), though full distribution is not known
Malosma laurina-Eriogonum fasciculatum-Salvia mellifera Association: South Coast (including coastal hills of San Diego County), Peninsular Ranges (Western Riverside County: Santa Ana Mountains), though full distribution is not known
Malosma laurina-Tetracoccus dioicus Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains), though full distribution is not known

REFERENCES
CNPS 2005, CNPS and CDFG 2005b, Evens and San In publication, Sawyer and Keeler-Wolf 1995

***Malosma laurina* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	MALA6	*Malosma laurina*	100	13.6	0.2	25
	ERFA2	*Eriogonum fasciculatum*	84.6	10.2	2	35
	ARCA11	*Artemisia californica*	84.6	1.9	0.2	8
	SAAP2	*Salvia apiana*	76.9	2.6	0.2	11
	YUWH	*Yucca whipplei*	61.5	0.7	0.2	3
	SAME3	*Salvia mellifera*	46.2	1.8	0.2	10
	HEAR5	*Heteromeles arbutifolia*	46.2	1.4	0.2	6
	ADFA	*Adenostoma fasciculatum*	46.2	0.5	0.2	3
	LOSC2	*Lotus scoparius*	23.1	0.2	0.2	1
Herb	HIIN3	*Hirschfeldia incana*	46.2	1.6	0.2	7
	BRDI3	*Bromus diandrus*	23.1	1.4	5	8
	BRMA3	*Bromus madritensis*	23.1	1	1	8
	MICA6	*Mirabilis californica*	23.1	0.1	0.2	1
	AVBA	*Avena barbata*	15.4	0.9	0.2	12
	MAMA8	*Marah macrocarpus*	15.4	0.6	2	6
	ERCI6	*Erodium cicutarium*	15.4	0.6	0.2	7
	CEME2	*Centaurea melitensis*	15.4	0.2	0.2	2
	PHMI	*Phacelia minor*	15.4	0.2	0.2	2

***Opuntia littoralis* Alliance (Coast Prickly-pear)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
One stand of *Opuntia littoralis* Shrubland forms an open shrub layer (20%) at 0.5-1m tall, where *Opuntia littoralis* is a dominant species with other coastal sage scrub species. The herbaceous layer is open to intermittent (65%) at 0-0.5m tall. Total vegetation cover is 80%.

In the one stand sampled, *Opuntia littoralis* was co-dominant with *Eriogonum fasciculatum*. Perennial and annual herbs were also present in the stand (see species table). There was evidence that stand was inhabited by Steven's kangaroo rat.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,388 ft.
Aspect: SE
Slope: moderate, range 12 degrees
Topography: undulating, top slope
Litter Cover: 5%
Rock Cover: 50%
Bare Ground: 45%
Parent Material: sedimentary
Soil Texture: moderately coarse sandy loam

The *Opuntia littoralis* Alliance was sampled only in the Perris Valley and Hills (M262Bk) Subsection at a low elevation site on the Lake Mathews Reserve, west of Monument Peak and ~1.5 miles south of Cajalco Road.

Samples used to describe alliance: (n=1) WRIV0451

RANK: G1 S1, G2 S1, G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: outer South Coast (including coastal hills and terraces of Ventura, Western Riverside, and San Diego Counties), Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (including western foothills of San Diego County), Channel Islands, Baja California

REFERENCES
CNPS and CDFG 2005b, Evens and San In publication, Sawyer and Keeler-Wolf 1995

***Opuntia littoralis* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ERFA2	*Eriogonum fasciculatum*	100	10	10	10
	OPLI3	*Opuntia littoralis*	100	9	9	9
	ENFA	*Encelia farinosa*	100	2	2	2
Herb	ERODI	*Erodium*	100	25	25	25
	ERCI6	*Erodium cicutarium*	100	25	25	25
	BRMA3	*Bromus madritensis*	100	10	10	10
	HEFA	*Hemizonia fasciculata*	100	5	5	5
	AMME	*Amsinckia menziesii*	100	2	2	2
	DICA14	*Dichelostemma capitatum*	100	1	1	1
	AVBA	*Avena barbata*	100	0.2	0.2	0.2
	CEME2	*Centaurea melitensis*	100	0.2	0.2	0.2
	NAPU4	*Nassella pulchra*	100	0.2	0.2	0.2
	PELI	*Pectocarya linearis*	100	0.2	0.2	0.2

***Prosopis glandulosa* Alliance (Honey Mesquite)**

ASSOCIATIONS
Prosopis glandulosa-Sambucus mexicana

LOCAL VEGETATION DESCRIPTION
Stands of *Prosopis glandulosa* Shrubland form an open to intermittent shrub layer (20-48%, mean 33.7%), where *Prosopis glandulosa* usually dominates. Shrubs consistently occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is open to intermittent (8-60%, mean 25.7%) at 0-1m tall. Emergent trees occur occasionally (2%, mean 2%) at 5-10m tall. Total vegetation cover is 40-75% (mean 56.7%).

In the ***Prosopis glandulosa-Sambucus mexicana* Association,** *Prosopis glandulosa* and *Sambucus mexicana* are consistently present in the shrub layer, where *Prosopis glandulosa* may be dominant or co-dominant with *Sambucus mexicana*. Other shrubs that are often present as sub-dominants include *Eriogonum fasciculatum*, *Atriplex canescens*, and *Artemisia californica*. A variety of native and non-native herbs occupy the understory herb layer (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,657-3,180 ft., mean 2,250 ft.
Aspect: variable
Slope: moderate, range 7-11 degrees, mean 8.7 degrees
Topography: concave, lower slopes
Litter Cover: range 5-30%, mean 17.5%
Rock Cover: range 16-17%, mean 16.5%
Bare ground: range 40-67%, mean 52.3%
Parent Material: alluvium
Soil Texture: medium to very fine sandy loam, medium loam

The *Prosopis glandulosa* Alliance was sampled in the Fontana Plain - Calimesa Terraces (M262Bj) and Perris Valley and Hills (M262Bk) Subsections usually at low elevations on alluvium that is intermittently flooded.

Samples used to describe alliance: (n=3) WRIV0022, WRIV0126, WRIV0946

RANK: G3 S2, G4 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: South Coast (including Western Riverside County: Perris Valley and Hills and Fontana Plain - Calimesa Terraces Subsections), Mojave and Colorado/Sonoran Deserts (including San Bernardino County, San Diego County: San Felipe Valley, and Anza Borrego Desert), southeastern Great Basin, Baja California, Arizona, south Nevada, New Mexico, Texas

Prosopis glandulosa-Sambucus mexicana Association: South Coast (Western Riverside County: Perris Valley and Hills and Fontana Plain - Calimesa Terraces Subsections), though full distribution is not known

REFERENCES
CDFG 1998, Evens and San In publication, Spolsky 1979, Thomas et al. 2004

***Prosopis glandulosa* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	PRGLT	*Prosopis glandulosa* var. *torreyana*	100	20.3	3	35
	SAME5	*Sambucus mexicana*	100	5.1	0.2	15
	ERFA2	*Eriogonum fasciculatum*	100	2.3	2	3
	ATCA2	*Atriplex canescens*	66.7	3.7	5	6
	ARCA11	*Artemisia californica*	66.7	2.3	3	4
	ATPO	*Atriplex polycarpa*	33.3	1	3	3
	JUCA7	*Juniperus californica*	33.3	0.7	2	2
	BASA4	*Baccharis salicifolia*	33.3	0.3	1	1
	ENFA	*Encelia farinosa*	33.3	0.1	0.2	0.2
	LOSC2	*Lotus scoparius*	33.3	0.1	0.2	0.2
	RHOV	*Rhus ovata*	33.3	0.1	0.2	0.2
	SAAP2	*Salvia apiana*	33.3	0.1	0.2	0.2
	SAME3	*Salvia mellifera*	33.3	0.1	0.2	0.2
	SICH	*Simmondsia chinensis*	33.3	0.1	0.2	0.2
	YUWH	*Yucca whipplei*	33.3	0.1	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	100	3.7	1	7
	HIIN3	*Hirschfeldia incana*	100	3.5	0.2	10
	ARDR4	*Artemisia dracunculus*	66.7	0.1	0.2	0.2
	BRDI3	*Bromus diandrus*	33.3	11.7	35	35
	AMME	*Amsinckia menziesii*	33.3	1.7	5	5
	ERCI6	*Erodium cicutarium*	33.3	1.7	5	5
	PHRA2	*Phacelia ramosissima*	33.3	0.7	2	2
	SISYM	*Sisymbrium*	33.3	0.7	2	2
	DAWR2	*Datura wrightii*	33.3	0.3	1	1
	ERSE3	*Eremocarpus setigerus*	33.3	0.3	1	1
	CEME2	*Centaurea melitensis*	33.3	0.1	0.2	0.2
	SATR12	*Salsola tragus*	33.3	0.1	0.2	0.2

***Prunus ilicifolia* Alliance (Hollyleaf Cherry)**

ASSOCIATIONS
Prunus ilicifolia-Heteromeles arbutifolia

LOCAL VEGETATION DESCRIPTION
Stands of *Prunus ilicifolia* Shrubland form an open to intermittent shrub layer (15-60%, mean 37.5%), where *Prunus ilicifolia* generally dominates. Shrubs may occur in two different strata, with low shrubs at 0-1m tall and tall shrubs at 2-5m tall. The herbaceous layer is open (8-15%, mean 11.5%) at 0-0.5m tall. Total vegetation cover is 20-70% (mean 45%).

In the ***Prunus ilicifolia-Heteromeles arbutifolia* Association,** *Prunus ilicifolia* dominates or co-dominates in the overstory shrub layer, and *Heteromeles arbutifolia* may be present at low cover. A variety of other species may intermix as sub-dominant shrubs, such as *Eriogonum fasciculatum*, *Toxicodendron diversilobum*, *Keckiella antirrhinoides*, *Adenostoma fasciculatum*, *Salvia apiana*, *and Salvia mellifera*. *Bowlesia incana*, *Marah macrocarpus*, *Muhlenbergia rigens*, *Leymus condensatus* and non-native *Bromus madritensis* are examples of species that may occur in the herb layer (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,841-3,094 ft., mean 2,468 ft.
Aspect: NE and NW
Slope: moderate to somewhat steep, range 7-22 degrees, mean 14.5 degrees
Topography: concave, mid to upper slopes
Litter Cover: 10% mean 10%
Rock Cover: 75% mean 75%
Bare Ground: 15% mean 15%
Parent Material: Mesozoic granite, mixed granitic and metamorphic
Soil Texture: medium to very fine sandy loam

The *Prunus ilicifolia* Alliance was sampled in the Perris Valley and Hills (M262Bk) and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections, primarily on north-trending, moderately steep slopes.

Samples used to describe alliance: (n=2) WRIV0208, WRIV0470

RANK: G2 S2, G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: outer Central and South Coast (includes Marin County south to Santa Barbara, Ventura, and Western Riverside Counties), Sierra Nevada foothills (Tuolumne County), inner Central Coast (including Santa Clara County),Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (including Western Riverside County: San Jacinto foothills; San Diego County: western foothills), Channel Islands

Prunus ilicifolia-Heteromeles arbutifolia Association: Central and South Coast (including Santa Barbara, Ventura, and Western Riverside Counties), Peninsular Ranges (including Western Riverside County: San Jacinto foothills; San Diego County: western foothills)

REFERENCES
Borchert et al. 2004, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens et al. 2004, Evens and San In publication, NatureServe et al. 2003a, Sawyer and Keeler-Wolf 1995

***Prunus ilicifolia* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	PRIL	*Prunus ilicifolia*	100	33	11	55
	ERFA2	*Eriogonum fasciculatum*	100	1.5	1	2
	HEAR5	*Heteromeles arbutifolia*	50	2.5	5	5
	TODI	*Toxicodendron diversilobum*	50	1	2	2
	KEAN	*Keckiella antirrhinoides*	50	0.5	1	1
	ADFA	*Adenostoma fasciculatum*	50	0.1	0.2	0.2
	ERCO25	*Eriophyllum confertiflorum*	50	0.1	0.2	0.2
	LOSU2	*Lonicera subspicata*	50	0.1	0.2	0.2
	SAAP2	*Salvia apiana*	50	0.1	0.2	0.2
	SAME3	*Salvia mellifera*	50	0.1	0.2	0.2
Herb	BOIN3	*Bowlesia incana*	50	3	6	6
	MAMA8	*Marah macrocarpus*	50	2.5	5	5
	BRMA3	*Bromus madritensis*	50	1.5	3	3
	MURI2	*Muhlenbergia rigens*	50	1.5	3	3
	LECO12	*Leymus condensatus*	50	0.5	1	1
	AMME	*Amsinckia menziesii*	50	0.1	0.2	0.2
	CAHE11	*Caulanthus heterophyllus*	50	0.1	0.2	0.2
	CHEIL	*Cheilanthes*	50	0.1	0.2	0.2
	CRYPT	*Cryptantha*	50	0.1	0.2	0.2
	EUCH	*Eucrypta chrysanthemifolia*	50	0.1	0.2	0.2
Cryptogam	MOSS	Moss	100	15	5	25
	LICHEN	Lichen	50	1.5	3	3

***Quercus berberidifolia* Alliance (Scrub Oak)**

ASSOCIATIONS
Quercus berberidifolia
Quercus berberidifolia-Fraxinus dipetala-Heteromeles arbutifolia
Quercus berberidifolia-Southern Mixed Chaparral

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus berberidifolia* Shrubland form an open to continuous shrub layer (15-90%, mean 65.3%), where *Quercus berberidifolia* usually dominates, though sometimes it co-dominates with other shrubs. The shrub layer frequently is in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (0.2-65%, mean 14.5%) at 0-1m tall, and includes a variety of native and non-native species (see species table). Emergent trees occur infrequently at trace cover (0-4% cover, mean 1.5%) at 5-10m tall, including *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus wislizeni*, *Platanus racemosa*. Total vegetation cover is 51-90% (mean 73.6%).

In the ***Quercus berberidifolia* Association,** *Quercus berberidifolia* is the sole dominant shrub in the intermittent to continuous shrub layer. A variety of other chaparral, coastal sage, and desert shrub species may be present, the most common being *Adenostoma fasciculatum*, *Salvia mellifera, Heteromeles arbutifolia, Rhamnus crocea,* and *Eriogonum fasciculatum*. The most common herb species include non-native annuals *Hirschfeldia incana*, *Bromus diandrus*, *Bromus madritensis*, and *Bromus tectorum*.

In the ***Quercus berberidifolia-Fraxinus dipetala-Heteromeles arbutifolia* Association,** *Quercus berberidifolia* frequently dominates, but may co-dominate with other shrubs. *Fraxinus dipetala* and *Heteromeles arbutifolia* are characteristically present as sub-dominants. Other commonly occurring species in the shrub layer include *Cercocarpus betuloides*, *Adenostoma fasciculatum*, *Rhamnus ilicifolia*, *Arctostaphylos glandulosa*, and *Garrya flavescens*. In this association*, Quercus berberidifolia* is dominant and *Heteromeles arbutifolia* is sub-dominant; however, in the *Heteromeles arbutifolia-Quercus berberidifolia-Cercocarpus betuloides-Fraxinus dipetala* Association, *Quercus berberidifolia* is co-dominant or sum-dominant with *Heteromeles arbutifolia*.

In the ***Quercus berberidifolia*-Southern Mixed Chaparral Association,** *Quercus berberidifolia* is usually co-dominant and consistently intermixes with a variety of other chaparral species (e.g., *Ceanothus crassifolius*, *Adenostoma fasciculatum*, *Heteromeles arbutifolia*, *Rhamnus ilicifolia*, *Ceanothus oliganthus*, *Arctostaphylos glandulosa*). In this association, *Quercus berberidifolia* co-dominates with various chaparral shrub species, but not with *Adenostoma fasciculatum*. In contrast, in the *Quercus berberidifolia-Adenostoma fasciculatum-Ceanothus crassifolius* Association, *Adenostoma fasciculatum* and/or *Ceanothus crassifolius* may co-dominate with *Quercus berberidifolia*, but not with other chaparral shrubs.

Arctostaphylos rainbowensis, a CNPS List 1B species (CNPS 2005), was found in 1 of 33 surveys of the *Quercus berberidifolia* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,070-4,895 ft., mean 2,970 ft.
Aspect: usually NE and NW, rarely SW and SE
Slope: moderate to steep, range 10-43 degrees, mean 27.7 degrees
Topography: variable, but more often undulating, lower to upper slopes
Litter Cover: range 6-90%, mean 59%
Rock Cover: range 0-63%, mean 14.7%
Bare ground: range 0.2-67%, mean 21.1%
Parent Material: more often sedimentary, less often Mesozoic granite, mixed granitic and metamorphic, gabbro and diorite, metavolcanic
Soil Texture: more often medium to very fine sandy loam, but varies from medium sand to clay

The *Quercus berberidifolia* alliance was a commonly sampled vegetation type, with sampling in the Santa Ana Mountains (M262Bf), San Gorgonio Mountains (M262Bg), Fontana Plain - Calimesa Terraces (M262Bj, San Jacinto Foothills - Cahuilla Mountains (M262Bl), San Jacinto Mountains (M262Bm), and Western Granitic Foothills (M262Bn) Subsections.

Samples used to describe alliance: (n=33) WRAA.010, WRAA.018, WRAA.030, WRAA.034, WRAA.039, WRAA.058, WRAA.114, WRIV0011, WRIV0060, WRIV0217, WRIV0219, WRIV0223, WRIV0225, WRIV0230, WRIV0253, WRIV0256, WRIV0257, WRIV0258, WRIV0260, WRIV0292, WRIV0297, WRIV0324, WRIV0521, WRIV0527, WRIV0564, WRIV0572, WRIV0588, WRIV0699, WRIV0733, WRIV0804, WRIV0873, WRIV0882, WRIV0981

RANK: G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: inner North Coast, Cascade Range foothills, Sierra Nevada foothills, Central Coast (including Los Padres National Forest and San Benito, Monterey, and San Luis Obispo Counties), South Coast and Peninsular Ranges (including Ventura, Western Riverside, and San Diego Counties), western Transverse Ranges (including Santa Monica Mountains), Anza-Borrego Desert, Baja California

Quercus berberidifolia Association: South Coast, montane Central Coast (Monterey and San Luis Obispo Counties), and Peninsular Ranges (including Ventura, Western Riverside, and San Diego Counties), though full distribution is not known
Quercus berberidifolia-Fraxinus dipetala-Heteromeles arbutifolia Association: Peninsular Ranges in Western Riverside, though full distribution is not known
Quercus berberidifolia-Southern Mixed Chaparral Association: Peninsular Ranges in Western Riverside, though full distribution is not known

REFERENCES
Allen 1989, Allen 1991, Borchert et al. 2004, CDFG 1998, CNPS 2005, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San In publication, Gordon and White 1994, Hanes 1976, Sawyer and Keeler-Wolf 1995

***Quercus berberidifolia* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	QUBE5	*Quercus berberidifolia*	100	35.7	8	75
	HEAR5	*Heteromeles arbutifolia*	69.7	3.4	0.2	15
	ADFA	*Adenostoma fasciculatum*	66.7	2.4	0.2	12
	FRDI2	*Fraxinus dipetala*	48.5	2.6	0.2	15
	CEBE3	*Cercocarpus betuloides*	48.5	2.5	0.2	23
	RHIL	*Rhamnus ilicifolia*	39.4	1.2	0.2	7
	ERFA2	*Eriogonum fasciculatum*	36.4	0.7	0.2	6
	CECR	*Ceanothus crassifolius*	33.3	2.5	1	22
	ARGL3	*Arctostaphylos glandulosa*	33.3	2.4	0.2	53
	SAME3	*Salvia mellifera*	33.3	0.7	0.2	7
	LOSU2	*Lonicera subspicata*	30.3	0.4	0.2	3
	GAFL2	*Garrya flavescens*	27.3	2.5	0.2	30
	RHOV	*Rhus ovata*	24.2	0.4	0.2	6
	ERCO25	*Eriophyllum confertiflorum*	24.2	0.3	0.2	2
	MIAU	*Mimulus aurantiacus*	24.2	0.2	0.2	5
	MALA6	*Malosma laurina*	21.2	0.6	0.2	6
Herb	BRMA3	*Bromus madritensis*	30.3	1.4	0.2	15
	BRDI3	*Bromus diandrus*	24.2	1.9	1	25
	MAMA8	*Marah macrocarpus*	24.2	0.4	0.2	4
	BRTE	*Bromus tectorum*	21.2	0.7	1	5
	HIIN3	*Hirschfeldia incana*	18.2	1.5	0.2	20

***Quercus berberidifolia-Adenostoma fasciculatum* Alliance (Scrub Oak – Chamise)**

ASSOCIATIONS
Quercus berberidifolia-Adenostoma fasciculatum
Quercus berberidifolia-Adenostoma fasciculatum-Ceanothus crassifolius

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus berberidifolia-Adenostoma fasciculatum* Shrubland form an open to continuous shrub layer (24-88%, mean 62.4%), where both species usually co-dominate. The shrub layer is often in two different strata, with low shrubs at 0-2m tall and tall shrubs at 0.5-5m tall. The herbaceous layer is open to continuous (0.2-52%, mean 14.2%) at 0-1m tall. Emergent trees occur infrequently (0.2%, mean 0.2%) at 5-10m tall, including *Quercus agrifolia*. Total vegetation cover is 24-90% (mean 69.1%).

In the ***Quercus berberidifolia-Adenostoma fasciculatum* Association,** a variety of coastal sage and chaparral shrubs (e.g., *Rhamnus ilicifolia*, *Salvia mellifera, Lonicera subspicata*, *Rhus ovata*, *Heteromeles arbutifolia*, *Eriogonum fasciculatum*) may occur at low cover in the open to continuous shrub layer.

In the ***Quercus berberidifolia-Adenostoma fasciculatum-Ceanothus crassifolius* Association,** *Ceanothus crassifolius* frequently sub-dominates, though it may co-dominate. Other shrubs occurring occasionally to often, include *Eriogonum fasciculatum*, *Malosma laurina*, *Salvia mellifera*, *Rhus ovata*, and *Keckiella antirrhinoides*. A variety of native and non-native annual species occur in the herb understory in associations of the *Quercus berberidifolia-Adenostoma fasciculatum* Alliance (see species table). In this association, *Adenostoma fasciculatum* and/or *Ceanothus crassifolius* may co-dominate with *Quercus berberidifolia*, but not with other chaparral shrubs. In contrast, in the *Quercus berberidifolia*-Southern Mixed Chaparral Association, *Quercus berberidifolia* co-dominates with various chaparral shrub species, but not with *Adenostoma fasciculatum*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,531-3,665 ft., mean 2,336 ft.
Aspect: usually NE and NW, rarely SW and SE
Slope: gentle to steep, range 3-45 degrees, mean 23 degrees
Topography: variable, but more often undulating, bottom to top slopes
Litter Cover: range 1-83%, mean 44.1%
Rock Cover: range 1-66%, mean 26.5%
Bare ground: range 2-63%, mean 23.2%
Parent Material: more often Mesozoic granite or sedimentary, less often gabbro and diorite, mixed granitic and metamorphic, alluvium
Soil Texture: more often medium to very fine sandy loam, but varies from coarse loamy sand to clay

The *Quercus berberidifolia-Adenostoma fasciculatum* Alliance was sampled in the Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl) and San Jacinto Mountains (M262Bm) Subsections, usually on north-trending, moderate to steep slopes.

Samples used to describe alliance: (n=22) WRAA.008, WRAA.089, WRAA.101, WRIV0144, WRIV0149, WRIV0227, WRIV0326, WRIV0345, WRIV0353, WRIV0358, WRIV0363, WRIV0364, WRIV0365, WRIV0368, WRIV0372, WRIV0381, WRIV0497, WRIV0592, WRIV0599, WRIV0607, WRIV0851, WRIV0991

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: South Coast (including Ventura and Western Riverside Counties), Transverse and Peninsular Ranges (including San Gabriel, San Bernardino, Santa Ana, San Jacinto, and San Diego County Mountains), Central Coast (J. Evens, personal observation)

Quercus berberidifolia-Adenostoma fasciculatum Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains, San Jacinto Mountains and Foothills; San Diego County: western foothills and Palomar - Cuyamaca Peak regions), though full distribution is not known
Quercus berberidifolia-Adenostoma fasciculatum-Ceanothus crassifolius Association: South Coast and Peninsular Ranges (Western Riverside County: Santa Ana Mountains, San Jacinto Mountains and Foothills, Perris Valley and Hills), though full distribution is not known

REFERENCES

Borchert 2004, Evens and San In publication, Gordon and White 1994, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Quercus berberidifolia-Adenostoma fasciculatum* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	QUBE5	*Quercus berberidifolia*	100	28.4	8	64
	ADFA	*Adenostoma fasciculatum*	100	21.4	2	45
	CECR	*Ceanothus crassifolius*	45.5	4.5	1	40
	RHIL	*Rhamnus ilicifolia*	45.5	1.7	0.2	15
	ERFA2	*Eriogonum fasciculatum*	45.5	0.8	0.2	4
	SAME3	*Salvia mellifera*	40.9	0.8	0.2	5
	RHOV	*Rhus ovata*	36.4	0.6	0.2	6
	MALA6	*Malosma laurina*	31.8	0.9	1	9
	LOSU2	*Lonicera subspicata*	31.8	0.7	0.2	5
	HEAR5	*Heteromeles arbutifolia*	27.3	1.1	0.2	15
	KEAN	*Keckiella antirrhinoides*	22.7	0.6	0.2	8
	YUWH	*Yucca whipplei*	22.7	0	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	40.9	1.9	0.2	15
	MAMA8	*Marah macrocarpus*	27.3	0.3	0.2	3
	BRDI3	*Bromus diandrus*	18.2	1.1	0.2	16
	HIIN3	*Hirschfeldia incana*	18.2	0.7	0.2	10

***Quercus berberidifolia-Cercocarpus betuloides* Alliance (Scrub Oak – Birchleaf Mountain-mahogany)**

ASSOCIATIONS
Quercus berberidifolia-Cercocarpus betuloides
Quercus berberidifolia-Cercocarpus betuloides-Arctostaphylos glauca
Quercus berberidifolia-Cercocarpus betuloides-Ceanothus crassifolius

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus berberidifolia-Cercocarpus betuloides* Shrubland form an open to continuous shrub layer (25-87%, mean 54.9%), where the two species may be co-dominant or either species may be sub-dominant to the other. The shrub layer is frequently in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (0.2-60%, mean 23.8%) at 0-1m tall, and includes a variety of native and non-native herbs (see species table). Total vegetation cover is 55-89% (mean 72.1%).

In the ***Quercus berberidifolia-Cercocarpus betuloides* Association,** various sub-dominant shrubs (e.g., *Rhamnus ilicifolia*, *Eriogonum fasciculatum*, *Adenostoma fasciculatum*, *Adenostoma sparsifolium*) often intermix in the shrub overstory.

In the ***Quercus berberidifolia-Cercocarpus betuloides-Arctostaphylos glauca* Association,** *Quercus berberidifolia, Cercocarpus betuloides,* and *Arctostaphylos glauca* are consistently present at low cover and intermix with a diversity of other shrubs. *Adenostoma fasciculatum*, *Arctostaphylos glauca*, *Lonicera subspicata*, *Adenostoma sparsifolium*, *Fraxinus dipetala*, and *Rhamnus ilicifolia* are often present at low to moderate cover.

In the ***Quercus berberidifolia-Cercocarpus betuloides-Ceanothus crassifolius* Association,** the shrub overstory is continuous and consists of at least two co-dominant shrubs. Co-dominant shrub species may include *Quercus berberidifolia*, *Cercocarpus betuloides*, *Ceanothus crassifolius*, *Rhamnus ilicifolia* and *Adenostoma fasciculatum*. Sub-dominant shrubs often include *Rhus ovata* and *Lonicera subspicata*.

Caulanthus simulans, a CNPS List 4 species (CNPS 2005), was found in 1 of 17 surveys of the *Quercus berberidifolia-Cercocarpus betuloides* Alliance. See Appendix 3 for more information on this plant.

Romneya coulteri, a CNPS List 4 species (CNPS 2005), was found in 1 of 17 surveys of the *Quercus berberidifolia-Cercocarpus betuloides* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,521-4,920 ft., mean 3,596 ft.
Aspect: usually NW and NE, rarely SW
Slope: moderate to steep, range 8-42 degrees, mean 23.2 degrees
Topography: variable, but more often undulating, lower to upper slopes
Litter Cover: range 7-90%, mean 47.3%
Rock Cover: range 2-80%, mean 27.2%
Bare ground: range 0-48%, mean 19.9%
Parent Material: more often Mesozoic granite, less often mixed granitic and metamorphic, sedimentary, gabbro and diorite, metavolcanic
Soil Texture: more often medium to very fine sandy loam, but varies from moderately coarse sandy loam to moderately fine sandy clay loam

The *Quercus berberidifolia-Cercocarpus betuloides* Alliance was sampled in the Santa Ana Mountains (M262Bf), San Jacinto Foothills - Cahuilla Mountains (M262Bl), and San Jacinto Mountains (M262Bm) Subsections usually on north-trending slopes that are moderate to steep.

Samples used to describe alliance: (n=17) WRAA.086, WRAA.096, WRIV0235, WRIV0325, WRIV0587, WRIV0604, WRIV0707, WRIV0714, WRIV0718, WRIV0729, WRIV0730, WRIV0809, WRIV0813, WRIV0815, WRIV0820, WRIV0875, WRIV0881

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: South and Central Coasts (including Los Padres National Forest), montane Transverse Ranges, montane Peninsular Ranges (including Western Riverside County)

Quercus berberidifolia-Cercocarpus betuloides Association: well represented in the southern Peninsular ranges (including Western Riverside County: San Jacinto Mountains and Foothills and Santa Ana Mountains) and identified in the Transverse Ranges
Quercus berberidifolia-Cercocarpus betuloides-Arctostaphylos glauca Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains, San Jacinto Foothills – Cahuilla Mountains, Santa Ana Mountains Subsections), though full distribution is not known
Quercus berberidifolia-Cercocarpus betuloides-Ceanothus crassifolius Association: Peninsular Ranges (Western Riverside County: Santa Ana Mountains), though full distribution is not known

REFERENCES
Borchert 2004, CNPS 2005, Gordon and White 1994, Sawyer and Keeler-Wolf 1995

***Quercus berberidifolia-Cercocarpus betuloides* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	QUBE5	*Quercus berberidifolia*	100	13.8	1	53
	CEBE3	*Cercocarpus betuloides*	100	13.5	2	27
	ADFA	*Adenostoma fasciculatum*	76.5	5	0.2	18
	ARGL4	*Arctostaphylos glauca*	64.7	4.2	0.2	20
	RHIL	*Rhamnus ilicifolia*	58.8	1.5	0.2	18
	LOSU2	*Lonicera subspicata*	58.8	1.1	1	3
	ADSP	*Adenostoma sparsifolium*	52.9	6.6	0.2	48
	ERFA2	*Eriogonum fasciculatum*	41.2	1.1	0.2	10
	FRDI2	*Fraxinus dipetala*	35.3	1.4	0.2	10
	PRIL	*Prunus ilicifolia*	29.4	0.2	0.2	2
	HEAR5	*Heteromeles arbutifolia*	23.5	0.8	0.2	8
	RHOV	*Rhus ovata*	23.5	0.7	0.2	5
	RHTR	*Rhus trilobata*	23.5	0.2	0.2	2
Herb	BRTE	*Bromus tectorum*	35.3	3.7	5	20
	BRDI3	*Bromus diandrus*	29.4	3.6	2	30
	CRIN8	*Cryptantha intermedia*	29.4	2.1	3	10
	BRMA3	*Bromus madritensis*	29.4	0.9	2	4
	PHDI	*Phacelia distans*	23.5	1.5	1	16
	VUMY	*Vulpia myuros*	23.5	1.2	1	12
	LOST4	*Lotus strigosus*	17.6	0.5	1	6
	ERCI6	*Erodium cicutarium*	17.6	0.5	2	4
	MAMA8	*Marah macrocarpus*	17.6	0.4	0.2	5
	MEIM	*Melica imperfecta*	17.6	0.2	0.2	2

***Quercus cornelius-mulleri* Alliance (Muller Oak)**

ASSOCIATIONS
Quercus cornelius-mulleri-Adenostoma sparsifolium-Ceanothus greggii
Quercus cornelius-mulleri-Adenostoma sparsifolium-Cercocarpus betuloides
Quercus cornelius-mulleri-Cercocarpus betuloides

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus cornelius-mulleri* Shrubland form an open to continuous shrub layer (21-68%, mean 28%). Q*uercus cornelius-mulleri* is a characteristic indicator species that is often co-dominant with other desert-transition shrubs, though it is occasionally dominant or sub-dominant. The shrub layer frequently is in two different strata, with low shrubs at 0-2m tall and tall shrubs at 0.5-5m tall. The herbaceous layer is open (0.2-25%, mean 8.8%) at 0-1m tall, and includes a variety of native and non-native herbs (see species table). Emergent trees infrequently occur at sparse cover (0.2-3%, mean 1.5%) at 5-15m tall, and may include *Pinus quadrifolia*, *Quercus chrysolepis*, or *Pinus coulteri*. Total vegetation cover is 22-80% (mean 51.3%).

In the ***Quercus cornelius-mulleri-Adenostoma sparsifolium-Ceanothus greggii* Association,** *Ceanothus greggii* and *Adenostoma sparsifolium* are characteristically present and are often co-dominant or sub-dominant; though either species may be dominant. Shrubs that often intermix in the shrub layer include *Adenostoma fasciculatum*, *Eriogonum fasciculatum*, *Cercocarpus betuloides*, and *Yucca schidigera*.

In the ***Quercus cornelius-mulleri-Adenostoma sparsifolium-Cercocarpus betuloides* Association,** *Adenostoma sparsifolium* and *Cercocarpus betuloides* are characteristically present as co-dominant or sub-dominant shrubs. *Eriogonum fasciculatum*, *Adenostoma fasciculatum*, *Ceanothus greggii*, and *Yucca schidigera* are often present at low cover.

In the ***Quercus cornelius-mulleri-Cercocarpus betuloides* Association**, *Quercus cornelius-mulleri* is frequently present as a sub-dominant shrub, while *Cercocarpus betuloides* is either dominant or co-dominant. *Eriogonum fasciculatum* is often intermixes in the shrub layer as a sub-dominant.

Caulanthus simulans, a CNPS List 4 species (CNPS 2005), was found in 1 of 23 surveys of the *Quercus cornelius-mulleri* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3,848-5,464 ft., mean 4,621 ft.
Aspect: all aspects (except flat)
Slope: gentle to steep, range 3-34 degrees, mean 19.1 degrees
Topography: variable, but more often undulating, bottom to top slopes
Litter Cover: range 5-80%, mean 34.3%
Rock Cover: range 11-85%, mean 44.4%
Bare ground: range 0-45%, mean 16.3%
Parent Material: more often Mesozoic granite or mixed granitic and metamorphic, less often sedimentary
Soil Texture: more often medium to very fine sandy loam, but varies from coarse loamy sand to moderately fine sandy clay loam

The *Quercus cornelius-mulleri* Alliance was sampled in the southeast portion of the study area in the San Jacinto Foothills - Cahuilla Mountains (M262Bl), San Jacinto Mountains (M262Bm), Palomar - Cuyamaca Peak, (M262Bo) Subsections. Survey sites were located east of the Santa Rosa Indian Reservation, along Morris Ranch Road, and in or near Anza-Borrego Desert State Park and the intersection of Highway 371 and Highway 74.

Samples used to describe alliance: (n=23) WRAA.073, WRAA.080, WRAA.081, WRAA.132, WRAA.134, WRAA.135, WRAA.142, WRIV0168, WRIV0169, WRIV0171, WRIV0172, WRIV0174,

WRIV0176, WRIV0177, WRIV0178, WRIV0179, WRIV0665, WRIV0666, WRIV0672, WRIV0674, WRIV0675, WRIV0680, WRIV0681

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: Anza-Borrego Desert, eastern Peninsular Ranges (Western Riverside County)

Quercus cornelius-mulleri-Adenostoma sparsifolium-Ceanothus greggii Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains, San Jacinto Foothills – Cahuilla Mountains, Palomar – Cuyamaca Peak Subsections), though full distribution is not known
Quercus cornelius-mulleri-Adenostoma sparsifolium-Cercocarpus betuloides Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains, San Jacinto Foothills – Cahuilla Mountains, Palomar – Cuyamaca Peak Subsections), though full distribution is not known
Quercus cornelius-mulleri-Cercocarpus betuloides Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills – Cahuilla Mountains Subsection), though full distribution is not known

REFERENCES
CDFG 1998, CNPS 2005

***Quercus cornelius-mulleri* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PIQU	*Pinus quadrifolia*	34.8	0.2	0.2	2
Shrub	QUCO7	*Quercus cornelius-mulleri*	100	12.8	1	51
	ADSP	*Adenostoma sparsifolium*	87	10.6	0.2	50
	CEBE3	*Cercocarpus betuloides*	78.3	5.7	0.2	30
	CEGR	*Ceanothus greggii*	73.9	9.2	0.2	40
	ADFA	*Adenostoma fasciculatum*	69.6	3.3	0.2	23
	ERFA2	*Eriogonum fasciculatum*	69.6	2.2	0.2	9
	YUSC2	*Yucca schidigera*	52.2	0.4	0.2	2
	RHOV	*Rhus ovata*	34.8	0.7	0.2	6
	ARGL4	*Arctostaphylos glauca*	26.1	0.2	0.2	2
	OPUNT	*Opuntia*	26.1	0.2	0.2	1
	OPBA2	*Opuntia basilaris*	26.1	0.1	0.2	1
	YUWH	*Yucca whipplei*	26.1	0.1	0.2	1
	PRIL	*Prunus ilicifolia*	21.7	0.4	0.2	8
Herb	BRTE	*Bromus tectorum*	34.8	2.2	1	12
	CRYPT	*Cryptantha*	30.4	0.8	0.2	5
	SACO6	*Salvia columbariae*	21.7	0.3	0.2	3
	BRMA3	*Bromus madritensis*	17.4	0.2	0.2	2

***Quercus palmeri* Alliance (Palmer's Oak)**

ASSOCIATIONS
Quercus palmeri-Eriogonum fasciculatum
Quercus palmeri-Eriogonum wrightii

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus palmeri* Shrubland form an open to continuous shrub layer (7-70%, mean 37.5%), where *Quercus palmeri* is usually the dominant shrub. Shrubs consistently occur in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (3-50%, mean 18.1%) at 0-0.5m tall, and includes a variety of native and non-native species (see species table).. Emergent trees occur infrequently (0.2-14%, mean 5.4%) at 5-15m tall, and may include *Pinus jeffreyi* and *Pinus quadrifolia*. Total vegetation cover is 21-75% (mean 46.6%).

In the ***Quercus palmeri-Eriogonum fasciculatum* Association,** *Quercus palmeri* typically dominates in the shrub layer, while *Eriogonum fasciculatum* is consistently present at low cover. Shrubs *Yucca schidigera*, *Opuntia parryi*, and *Ribes quercetorum* are often present at sparse cover.

In the ***Quercus palmeri-Eriogonum wrightii* Association,** *Quercus palmeri* dominates in the overstory shrub layer at low to moderate cover, while *Eriogonum wrightii* is consistently present at sparse cover in the shrub understory. *Gutierrezia californica* is often present as a sub-dominant in the low shrub layer.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3,625-4,390 ft., mean 4,452 ft.
Aspect: variable
Slope: flat to somewhat steep, range 0-22 degrees, mean 7.1 degrees
Topography: undulating or flat, bottom to top slopes
Litter Cover: range 0-50%, mean 16%
Rock Cover: range 35-70%, mean 54.3%
Bare ground: range 2-63%, mean 25.2%
Parent Material: Mesozoic granite, sedimentary
Soil Texture: more often medium to very fine sandy loam, but varies from coarse sand to medium loam

The *Quercus palmeri* alliance was only sampled in the San Jacinto Foothills - Cahuilla Mountains (M262BI) Subsection at middle elevations. Sampling sites were located along Highway 74, just east of the intersection of Highway 74 and Highway 371. It is possible that this alliance is found within the Santa Rosa Indian Reservation.

Samples used to describe alliance: (n=8) WRIV0074, WRIV0157, WRIV0160, WRIV0161, WRIV0165, WRIV0693, WRIV0719, WRIV0756

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: Anza-Borrego Desert, eastern Peninsular Ranges (Western Riverside County)

Quercus palmeri-Eriogonum fasciculatum Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains Subsection), though full distribution is not known
Quercus palmeri-Eriogonum wrightii Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains Subsection), though full distribution is not known

REFERENCES
CDFG 1998

***Quercus palmeri* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PIJE-t	*Pinus jeffreyi*	25	1.1	1	8
	PIQU	*Pinus quadrifolia*	25	0.9	1	6
Tree Understory	QUPA10-m	*Quercus palmeri*	87.5	20	11	45
Shrub	GUSA2	*Gutierrezia sarothrae*	50	2.5	3	7
	ERFA2	*Eriogonum fasciculatum*	50	2.4	2	8
	ADSP	*Adenostoma sparsifolium*	37.5	3.1	1	22
	ERWR	*Eriogonum wrightii*	37.5	1.4	2	5
Shrub	ARTR2	*Artemisia tridentata*	37.5	1	1	6
	YUSC2	*Yucca schidigera*	25	1.4	1	10
	ARPU5	*Arctostaphylos pungens*	25	0.9	0.2	7
	OPPA2	*Opuntia parryi*	25	0.6	2	3
	LOSU2	*Lonicera subspicata*	25	0.5	1	3
	RIQU	*Ribes quercetorum*	25	0.5	1	3
	ADFA	*Adenostoma fasciculatum*	25	0.3	0.2	2
	ARGL4	*Arctostaphylos glauca*	25	0.1	0.2	0.2
Herb	BRTE	*Bromus tectorum*	50	3.9	1	15
	NEME	*Nemophila menziesii*	37.5	0.8	2	2
	BROMU	*Bromus*	25	2.5	10	10
	ARDR4	*Artemisia dracunculus*	25	1	1	7
	LEFI11	*Lessingia filaginifolia*	25	0.1	0.2	0.2

***Quercus wislizeni* Alliance (Interior Live Oak)**

ASSOCIATIONS
Quercus wislizeni-Adenostoma sparsifolium-Cercocarpus betuloides
Quercus wislizeni-Cercocarpus betuloides

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus wislizeni* Shrubland form an open to continuous shrub layer (4-70%, mean 45.8%), where *Quercus wislizeni* dominates or co-dominates with other shrubs. The shrub layer is frequently in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (3-35%, mean 17.6%) at 0-1m tall, where natives and non-natives intermix (see species table).. Emergent trees may be present (1-8% cover, mean 4.2%) at 5-20m tall, including *Pinus coulteri*, *Pinus jeffreyi*, *Quercus chrysolepis*, *Quercus kelloggii*, or *Abies concolor*. Total vegetation cover is 7-80% (mean 59.1%).

In the ***Quercus wislizeni-Adenostoma sparsifolium-Cercocarpus betuloides* Association,** *Quercus wislizeni* usually co-dominates with *Cercocarpus betuloides* and *Adenostoma sparsifolium*. *Ceanothus greggii* and *Rhus trilobata* are sometimes present in the shrub overstory.

In the ***Quercus wislizeni-Cercocarpus betuloides* Association,** *Cercocarpus betuloides* is consistently co-dominant or sub-dominant with *Quercus wislizeni*, and *Adenostoma sparsifolium* is absent. *Sambucus mexicana* is often present in the shrub overstory.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 3,182-6,389 ft., mean 4,780 ft.
Aspect: all aspects (except flat)
Slope: gentle to steep, range 2-39 degrees, mean 19.9 degrees
Topography: convex, flat, or undulating, bottom to upper slopes
Litter Cover: range 10-85%, mean 46.9%
Rock Cover: range 0-70%, mean 28.1%
Bare ground: range 5-50%, mean 20.1%
Parent Material: more often Mesozoic granite, less often alluvium, sedimentary, mixed granitic and metamorphic
Soil Texture: more often medium to very fine sandy loam, but also varies from medium sand to moderately coarse sandy loam

The *Quercus wislizeni* Alliance was sampled in the San Gorgonio Mountains (M262Bg), Fontana Plain - Calimesa Terraces (M262Bj, San Jacinto Foothills - Cahuilla Mountains (M262Bl), and San Jacinto Mountains (M262Bm) Subsections.

Samples used to describe alliance: (n=15) WRAA.072, WRIV0722, WRIV0749, WRIV0751, WRIV0755, WRIV0760, WRIV0772, WRIV0777, WRIV0801, WRIV0845, WRIV0856, WRIV0903, WRIV0924, WRIV0947, WRIV0948

RANK: G5 S5 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: inner North Coast, Central Coast (San Benito County and Los Padres National Forest), Cascade Range foothills, Sierra Nevada Foothills, montane Sierra Nevada, montane Transverse Ranges and Peninsular Ranges (including San Bernardino, San Jacinto, and San Gorgonio Mountains)

Quercus wislizeni-Adenostoma sparsifolium-Cercocarpus betuloides Association: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains and San Jacinto Mountains Subsections), though full distribution is not known

Quercus wislizeni-Cercocarpus betuloides Association: Peninsular Ranges (Western Riverside County: San Gorgonio Mountains, Fontana Plain - Calimesa Terraces, and San Jacinto Mountains Subsections), though full distribution is not known)

REFERENCES

Allen et al. 1991, Borchert 2004, CDFG 1998, CNPS and CDFG 2005a, Gordon and White 1994, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Quercus wislizeni* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	QUWI2-t	*Quercus wislizeni*	26.7	2.7	3	30
	PICO3-t	*Pinus coulteri*	20	1	2	8
	QUCH2-t	*Quercus chrysolepis*	20	0.7	1	6
	PIJE-t	*Pinus jeffreyi*	20	0.4	1	3
Tree Understory	QUWI2-m	*Quercus wislizeni*	100	23.5	2	67
Shrub	CEBE3	*Cercocarpus betuloides*	86.7	9.4	1	40
	LOSU2	*Lonicera subspicata*	60	1.4	0.2	10
	ADSP	*Adenostoma sparsifolium*	46.7	4.5	1	28
	RHIL	*Rhamnus ilicifolia*	26.7	0.7	0.2	7
	ARPU5	*Arctostaphylos pungens*	26.7	0.5	1	3
	CELE2	*Ceanothus leucodermis*	20	1.1	0.2	14
	ARPR	*Arctostaphylos pringlei*	20	1.1	2	10
	ARGL3	*Arctostaphylos glandulosa*	20	0.9	0.2	12
	CEGR	*Ceanothus greggii*	20	0.8	0.2	12
	RHTR	*Rhus trilobata*	20	0.3	0.2	3
	GAFL2	*Garrya flavescens*	20	0.3	0.2	4
	SAME5	*Sambucus mexicana*	20	0.3	0.2	3
Herb	BRTE	*Bromus tectorum*	53.3	6.1	3	17
	BRDI3	*Bromus diandrus*	26.7	1.9	5	10
	CRIN8	*Cryptantha intermedia*	26.7	0.4	0.2	4
	GAAN2	*Galium angustifolium*	26.7	0.3	0.2	2
	CLPA5	*Claytonia parviflora*	20	0.5	1	4
	CRYPT	*Cryptantha*	20	0.4	1	3

***Quercus wislizeni-Ceanothus leucodermis* Alliance (Interior Live Oak – Chaparral Whitethorn)**

ASSOCIATIONS
Quercus wislizeni-Ceanothus leucodermis
Quercus wislizeni-Ceanothus leucodermis/*Pinus coulteri*

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus wislizeni-Ceanothus leucodermis* Shrubland form an open to continuous shrub layer (26-85%, mean 59.6%), where both species usually co-dominate. Shrubs occasionally occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is open to intermittent (0.2-50%, mean 19.4%) at 0-1m tall, and includes mixtures of native and non-native herbs (see species table). Emergent conifers occur occasionally (0.2-10, mean 5.8%) at 5-15m tall. Total vegetation cover is 60-86% (mean 75.4%).

In the ***Quercus wislizeni-Ceanothus leucodermis* Association,** both species create an open to continuous shrub canopy. Other shrubs may occur at low cover, including *Adenostoma fasciculatum* and *Cercocarpus betuloides*. *Pinus coulteri* and *Quercus chrysolepis* may be present in the tree overstory at trace cover.

In the ***Quercus wislizeni-Ceanothus leucodermis*/*Pinus coulteri* Association,** *Pinus coulteri* is consistently present in the tree overstory at low cover. Other common species include shrub *Eriogonum fasciculatum*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4,497-5,658 ft., mean 5,021 ft.
Aspect: SW and SE
Slope: moderate to steep, range 10-29 degrees, mean 19 degrees
Topography: variable, mid to upper slopes
Litter Cover: range 15-85%, mean 62%
Rock Cover: range 0-55%, mean 20.3%
Bare ground: range 1-34%, mean 12.5%
Parent Material: most often Mesozoic granite, less often metavolcanic
Soil Texture: more often medium to very fine sandy loam, less often medium silt loam or moderately coarse sandy loam

The *Quercus wislizeni-Ceanothus leucodermis* Alliance was sampled in the Santa Ana Mountains (M262Bf) and San Jacinto Mountains (M262Bm) Subsections in the middle montane on south-trending, moderate to steep slopes.

Samples used to describe alliance: (n=8) WRIV0331, WRIV0793, WRIV0843, WRIV0859, WRIV0862, WRIV0870, WRIV0893, WRIV0918

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: montane Transverse and Peninsular Ranges (including San Bernardino, San Jacinto, and Santa Ana Mountains)

Quercus wislizeni-Ceanothus leucodermis Association: same distribution as alliance
Quercus wislizeni-Ceanothus leucodermis/*Pinus coulteri* Association: Peninsular Ranges (Western Riverside County: San Jacinto Mountains), though full distribution is not known

REFERENCES
Gordon and White 1994, Sawyer and Keeler-Wolf 1995, White and Sawyer 1995

***Quercus wislizeni-Ceanothus leucodermis* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PICO3-t	*Pinus coulteri*	50	2.9	0.2	10
	QUCH2-t	*Quercus chrysolepis*	25	0.1	0.2	0.2
Tree Understory	QUWI2-m	*Quercus wislizeni*	100	22.3	9	55
	QUCH2-m	*Quercus chrysolepis*	25	0.6	0.2	5
Shrub	CELE2	*Ceanothus leucodermis*	100	28.3	5	60
	ADFA	*Adenostoma fasciculatum*	37.5	1.3	1	8
	ERFA2	*Eriogonum fasciculatum*	37.5	1	0.2	6
	ARPR	*Arctostaphylos pringlei*	25	4	1	31
	RHCA	*Rhamnus californica*	25	2.8	1	21
	CEBE3	*Cercocarpus betuloides*	25	0.5	1	3
Herb	BRTE	*Bromus tectorum*	75	5.4	0.2	15
	CAMIS	*Camissonia*	62.5	1.2	0.2	6
	VUMY	*Vulpia myuros*	37.5	2.9	1	20
	CRIN8	*Cryptantha intermedia*	25	1.6	4	9
	GILIA	*Gilia*	25	0.6	0.2	5
	MAMA8	*Marah macrocarpus*	25	0.6	2	3

***Quercus wislizeni-Quercus berberidifolia* Alliance (Interior Live Oak - Scrub Oak)**

ASSOCIATIONS
Quercus wislizeni-Quercus berberidifolia
Quercus wislizeni-Quercus berberidifolia-Fraxinus dipetala

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus wislizeni-Quercus berberidifolia* Shrubland form an open tree layer (4-32%, mean 16.5% and an open to continuous shrub layer (17-85%, mean 47.9%), where *Quercus wislizeni* may be present as a tree and/or shrub. Both *Quercus wislizeni* and *Quercus berberidifolia* are consistently present in the overstory, where the two species may be co-dominant or one may be sub-dominant to the other. The shrub layer frequently is in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to continuous (7-85%, mean 47.9%) at 0-2m tall. Trees that are infrequently to occasionally present at low cover (4-32%, mean 16.5%) include *Quercus agrifolia*, *Quercus wislizeni, Juglans* spp., *Quercus chrysolepis, Platanus racemosa,* and *Pinus coulteri*. Total vegetation cover is 55-90% (mean 72.6%).

In the ***Quercus wislizeni-Quercus berberidifolia* Association,** *Quercus wislizeni* may occur as a shrub and/or a tree, while *Quercus berberidifolia* is present as a shrub. The most common sub-dominant shrub species include *Lonicera subspicata*, *Rhus trilobata*, *Cercocarpus betuloides*, and *Toxicodendron diversilobum*.

In the ***Quercus wislizeni-Quercus berberidifolia-Fraxinus dipetala* Association,** *Quercus berberidifolia* and *Quercus wislizeni* are consistently present in the shrub overstory, where *Quercus berberidifolia* is generally dominant or co-dominant. Other shrubs include, characteristically present *Fraxinus dipetala* and *Cercocarpus betuloides*, and often present *Adenostoma fasciculatum*, *Eriogonum fasciculatum*, and *Arctostaphylos glauca*.

Mimulus diffusus, a CNPS List 4 species (CNPS 2005), was found in 1 of 14 surveys of the *Quercus wislizeni-Quercus berberidifolia* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 3,065-5,038 ft., mean 4,085 ft.
Aspect: usually NE and NW, rarely SW
Slope: gentle to steep, range 2-40 degrees, mean 19.4 degrees
Topography: variable, but more often undulating, lower to top slopes
Litter Cover: range 7-80%, mean 56.3%
Rock Cover: range 0-44%, mean 12.5%
Bare ground: range 10-80%, mean 26.3%
Parent Material: sedimentary, Mesozoic granite, mixed granitic and metamorphic, mixed igneous and metamorphic, alluvium
Soil Texture: more often medium to very fine sandy loam, but varies from moderately coarse sandy loam to medium silt loam

The *Quercus wislizeni-Quercus berberidifolia* Alliance was sampled in the San Gorgonio Mountains (M262Bg), Fontana Plain - Calimesa Terraces (M262Bj, and San Jacinto Mountains (M262Bm) Subsections.

Samples used to describe alliance: (n=14) WRAA.140, WRIV0705, WRIV0709, WRIV0711, WRIV0712, WRIV0725, WRIV0726, WRIV0728, WRIV0824, WRIV0836, WRIV0944, WRIV0951, WRIV0964, WRIV0968

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: montane Transverse and Peninsular Ranges (including southern San Bernardino Mountains, Fontana Plain, and Santa Ana, San Gorgonio, and San Jacinto Mountains)

Quercus wislizeni-Quercus berberidifolia Association: same distribution as alliance
Quercus wislizeni-Quercus berberidifolia-Fraxinus dipetala Association: Peninsular Ranges (Western Riverside County: San Jacinto and San Gorgonio Mountains), though full distribution is not known

REFERENCES
CNPS 2005, Gordon and White 1994, Minnich 1976, Sawyer and Keeler-Wolf 1995

***Quercus wislizeni-Quercus berberidifolia* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	QUWI2-t	*Quercus wislizeni*	35.7	5.7	4	32
	QUAG-t	*Quercus agrifolia*	28.6	2.7	5	20
Tree Understory	QUWI2-m	*Quercus wislizeni*	85.7	7.6	1	28
Shrub	QUBE5	*Quercus berberidifolia*	100	25.5	2	75
	CEBE3	*Cercocarpus betuloides*	64.3	2.1	0.2	8
	LOSU2	*Lonicera subspicata*	57.1	2	0.2	6
	FRDI2	*Fraxinus dipetala*	50	3.8	0.2	17
	RHTR	*Rhus trilobata*	42.9	1.2	1	5
	ERFA2	*Eriogonum fasciculatum*	42.9	0.6	0.2	3
	RHIL	*Rhamnus ilicifolia*	35.7	0.7	0.2	3
	ADFA	*Adenostoma fasciculatum*	35.7	0.5	0.2	5
	ARGL4	*Arctostaphylos glauca*	35.7	0.3	0.2	2
	ARTR2	*Artemisia tridentata*	21.4	1.2	0.2	11
	QUCO7	*Quercus cornelius-mulleri*	21.4	0.9	2	5
	TODI	*Toxicodendron diversilobum*	21.4	0.4	1	3
	SAAP2	*Salvia apiana*	21.4	0.2	0.2	2
Herb	BRTE	*Bromus tectorum*	71.4	4.8	1	25
	BRDI3	*Bromus diandrus*	64.3	2.7	1	10
	MAMA8	*Marah macrocarpus*	35.7	0.9	1	7
	BRMA3	*Bromus madritensis*	28.6	1.9	3	15
	CRYPT	*Cryptantha*	21.4	1.5	1	15
	PHDI	*Phacelia distans*	21.4	0.3	0.2	2

***Quercus wislizeni-Quercus chrysolepis* Alliance (Interior Live Oak – Canyon Live Oak)**

ASSOCIATIONS
Quercus wislizeni-Quercus chrysolepis
Quercus wislizeni-Quercus chrysolepis/*Pinus coulteri*

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus wislizeni-Quercus chrysolepis* Shrubland and Woodland/Forest form an open to continuous tree layer (4-69%, mean 33.3%) at 5-35m tall and an open to continuous shrub layer (15-90%, mean 47.5%) at 0-5m tall. *Quercus wislizeni* and *Quercus chrysolepis* dominate the tree and/or shrub layers, and either species may be present as a shrub/tree. *Pseudotsuga macrocarpa*, *Pinus jeffreyi*, *Abies concolor*, and *Pinus lambertiana* may be present at trace cover in the conifer overstory. The shrub layer is often in two different strata, with low shrubs at 0-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is open (0.2-30%, mean 6.4%) at 0-1m tall, and includes a variety of native and non-native species (see species table). Total vegetation cover is 56-95% (mean 76.1%).

In the ***Quercus wislizeni-Quercus chrysolepis* Association,** both species typically co-dominate in the same layer or they dominate in shrub and tree layers (*Quercus wislizeni* as a shrub and *Quercus chrysolepis* as a tree). In the shrub layer, *Ceanothus leucodermis*, *Eriogonum fasciculatum*, and *Arctostaphylos glandulosa* are occasionally present at low cover.

In the ***Quercus wislizeni-Quercus chrysolepis*/*Pinus coulteri* Association,** both oak species typically co-dominate in the same layer or they dominate in shrub and tree layers (*Quercus wislizeni* as a shrub and *Quercus chrysolepis* as a tree). *Pinus coulteri* is consistently present at low cover in the overstory. *Arctostaphylos pringlei* and *Ceanothus leucodermis* are occasionally present at low cover. .

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3,199-6,702 ft., mean 5,250 ft.
Aspect: all aspects (except flat)
Slope: moderate to very steep, range 12-49 degrees, mean 29.4 degrees
Topography: more often undulating, less often convex, lower to top slopes
Litter Cover: range 20-90%, mean 65.3%
Rock Cover: range 6-40%, mean 20%
Bare ground: range 2-40%, mean 9.8%
Parent Material: more often Mesozoic granite, less often sedimentary or metavolcanic
Soil Texture: more often medium to very fine sandy loam or moderately coarse sandy loam, less often moderately fine clay loam

The *Quercus wislizeni-Quercus chrysolepis* Alliance was sampled in the Santa Ana Mountains (M262Bf) and San Jacinto Mountains (M262Bm) Subsection.

Samples used to describe alliance: (n=15) WRIV0259, WRIV0288, WRIV0289, WRIV0334, WRIV0339, WRIV0767, WRIV0769, WRIV0786, WRIV0792, WRIV0794, WRIV0861, WRIV0868, WRIV0895, WRIV0900, WRIV0914

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: Central Coast (including San Benito County), montane Transverse Ranges and Peninsular Ranges (including San Bernardino, San Jacinto, and Santa Ana Mountains)

Quercus wislizeni-Quercus chrysolepis Association: same as alliance
Quercus wislizeni-Quercus chrysolepis/*Pinus coulteri* Association: Peninsular Ranges (Western Riverside County: San Jacinto and Santa Ana Mountains), though full distribution is not known

REFERENCES

CNPS and CDFG 2005a, Gordon and White 1994, NatureServe et al. 2003b, Sawyer and Keeler-Wolf 1995

***Quercus wislizeni-Quercus chrysolepis* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	QUCH2-t	*Quercus chrysolepis*	80	24	6	58
	PICO3-t	*Pinus coulteri*	66.7	3.8	0.2	13
	QUWI2-t	*Quercus wislizeni*	33.3	2.6	3	22
	PSMA-t	*Pseudotsuga macrocarpa*	26.7	0.2	0.2	3
Tree Understory	QUWI2-m	*Quercus wislizeni*	100	31.4	4	75
	QUCH2-m	*Quercus chrysolepis*	60	6.6	2	17
Shrub	CELE2	*Ceanothus leucodermis*	46.7	1.2	0.2	9
	ARGL3	*Arctostaphylos glandulosa*	33.3	1.2	0.2	9
	ERFA2	*Eriogonum fasciculatum*	33.3	1	0.2	8
	ARPR	*Arctostaphylos pringlei*	33.3	0.8	0.2	10
	CEBE3	*Cercocarpus betuloides*	20	2.1	1	30
	KECO	*Keckiella cordifolia*	20	0.7	1	5
	ADFA	*Adenostoma fasciculatum*	20	0.3	0.2	3
Herb	BRTE	*Bromus tectorum*	33.3	2.6	2	25
	CRIN8	*Cryptantha intermedia*	20	0.9	1	10

***Rhamnus tomentella* Alliance (Chaparral Coffeeberry)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
One stand of *Rhamnus tomentella* subsp. *tomentella* Shrubland forms an open shrub layer (30%), where *Rhamnus tomentella* dominates. The shrub layer is in two different strata, where low shrubs are 1-2m tall and tall shrubs are 2-5m tall. The herbaceous layer is intermittent (40%) at 0-0.5m tall. Total vegetation cover is 65%.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, 3,227 ft.
Aspect: flat
Slope: flat, 0 degrees, mean 0 degrees
Topography: flat, bottom to lower slope
Litter Cover: no data
Rock Cover: no data
Bare ground: no data
Parent Material: alluvium
Soil Texture: medium to very fine sandy loam

The *Rhamnus tomentella* Alliance was sampled only in the San Jacinto Foothills - Cahuilla Mountains (M262BI) Subsection along a flat expanse.

Samples used to describe alliance: (n=1) WRIV0082

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: North and Central Coast (including Napa to Santa Clara Counties), Sierra Nevada foothills (including Tuolumne County), Peninsular Ranges (including Western Riverside and San Diego Counties), though full distribution is not known

REFERENCES
Evens et al. 2004, Evens and San 2004, Evens and San In publication

***Rhamnus tomentella* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	RHTO6	*Rhamnus tomentella*	100	22	22	22
	SAME5	*Sambucus mexicana*	100	7	7	7
	ERPI7	*Ericameria pinifolia*	100	6	6	6
	OPPA2	*Opuntia parryi*	100	2	2	2
	ARTR2	*Artemisia tridentata*	100	0.2	0.2	0.2
	GAVE2	*Garrya veatchii*	100	0.2	0.2	0.2
	SEFL3	*Senecio flaccidus*	100	0.2	0.2	0.2
Herb	BRTE	*Bromus tectorum*	100	25	25	25
	ARDR4	*Artemisia dracunculus*	100	2	2	2
	CUFO	*Cucurbita foetidissima*	100	1	1	1

***Rhus ovata* Alliance (Sugarbush)**

ASSOCIATIONS
Rhus ovata-Ziziphus parryi

LOCAL VEGETATION DESCRIPTION
Stands of *Rhus ovata* Shrubland form an open to intermittent shrub layer (23-50%, mean 32.3%), where *Rhus ovata* dominates. The shrub layer is frequently in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to continuous (4-75%, mean 25.5%) at 0-1m tall. Total vegetation cover is 12-68% (mean 32.3%).

In the ***Rhus ovata-Ziziphus parryi* Association,** *Rhus ovata* and *Ziziphus parryi* usually co-dominate in the shrub overstory. Sub-dominant shrub species include consistently present *Opuntia parryi* and *Eriogonum fasciculatum*. *Ericameria linearifolia*, *Quercus cornelius-mulleri*, *Echinocereus engelmannii*, *Juniperus californica*, and *Opuntia basilaris* are occasionally present. A variety of native and non-native species occupy the herb understory in this association (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2,316-3,722 ft., mean 3,333 ft.
Aspect: variable
Slope: gentle to steep, range 2-34 degrees, mean 16.1 degrees
Topography: variable, but more often convex, bottom to upper slopes
Litter Cover: range 3-50%, mean 13.8%
Rock Cover: range 3-85%, mean 51.9%
Bare ground: range 5-87%, mean 31%
Parent Material: more often mixed granitic and metamorphic, less often sedimentary
Soil Texture: varies from sand to moderately fine sandy clay loam

The *Rhus ovata* Alliance was sampled only in the San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsection.

Samples used to describe alliance: (n=8) WRIV0574, WRIV0653, WRIV0654, WRIV0657, WRIV0659, WRIV0662, WRIV0669, WRIV0823

RANK: G4 S4 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: Transverse Ranges (Santa Monica Mountains), Peninsular Ranges (Western Riverside County: San Jacinto Foothills), Anza-Borrego Desert

Rhus ovata-Ziziphus parryi Association: Peninsular Ranges (Western Riverside County: Western Riverside County: San Jacinto Foothills – Cahuilla Mountains Subsection, San Diego County: Palomar – Cuyamaca Peak Subsection), Colorado Desert (including Anza-Borrego Desert) though full distribution is not known

REFERENCES
CDFG 1998, CNPS and CDFG 2005b, Evens and San In publication

***Rhus ovata* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	RHOV	*Rhus ovata*	100	11.8	4	30
	ERFA2	*Eriogonum fasciculatum*	75	3	0.2	7
	YUSC2	*Yucca schidigera*	75	1.5	1	3
	ZIPA	*Ziziphus parryi*	62.5	6.9	2	20
	OPPA2	*Opuntia parryi*	62.5	2.1	2	5
	ECEN	*Echinocereus engelmannii*	37.5	0.5	0.2	3
	ADFA	*Adenostoma fasciculatum*	37.5	0.5	1	2
	ERLI6	*Ericameria linearifolia*	25	1	4	4
	PRIL	*Prunus ilicifolia*	25	1	1	7
	ENCA	*Encelia californica*	25	0.8	1	5
	SAAP2	*Salvia apiana*	25	0.6	0.2	5
	KEAN	*Keckiella antirrhinoides*	25	0.4	0.2	3
	QUCO7	*Quercus cornelius-mulleri*	25	0.4	1	2
	YUWH	*Yucca whipplei*	25	0.3	1	1
	HEAR5	*Heteromeles arbutifolia*	25	0.2	0.2	1
	JUCA7	*Juniperus californica*	25	0.2	0.2	1
	OPBA2	*Opuntia basilaris*	25	0.2	0.2	1
Herb	SCBA	*Schismus barbatus*	50	3.9	3	13
	BRMA3	*Bromus madritensis*	50	2.9	0.2	20
	PHMI	*Phacelia minor*	37.5	2.1	5	6
	MIBI8	*Mirabilis bigelovii*	37.5	0.9	1	3
	MAMA8	*Marah macrocarpus*	37.5	0.8	1	3
	PHDI	*Phacelia distans*	25	2.1	7	10
	SACO6	*Salvia columbariae*	25	1.8	2	12
	EMPE	*Emmenanthe penduliflora*	25	1.3	2	8
	LAGL5	*Layia glandulosa*	25	0.8	1	5
	CAMIS	*Camissonia*	25	0.2	0.2	1

***Rhus trilobata* Alliance (Skunkbrush)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
One stand of *Rhus trilobata* Shrubland forms an open shrub layer (30%), where *Rhus trilobata* dominates. The shrub layer is frequently in two strata, with low shrubs at 0.5-1m tall and tall shrubs at 1-2m tall. The herbaceous layer is open (20%) at 0-0.5m tall. Total vegetation cover is 43%.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 2,179 ft.
Aspect: NE
Slope: steep, 37 degrees
Topography: flat, upper slope
Litter Cover: no data
Rock Cover: no data
Bare ground: no data
Parent Material: Mesozoic granite
Soil Texture: medium loam

The *Rhus trilobata* Alliance was sampled only in the Perris Valley and Hills (M262Bk) Subsection on a rocky upper slope at a low elevation.

Samples used to describe alliance: (n=1) WRIV0435

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: South Coast and Peninsular Ranges (including Western Riverside County: Perris Valley and Hills; San Diego County: Palomar - Cuyamaca Peak region), Anza-Borrego Desert, though full distribution is not known, CO, ID, NM, UT

REFERENCES
CDFG 1998, Evens and San In publication

***Rhus trilobata* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	RHTR	*Rhus trilobata*	100	15	15	15
	RHIL	*Rhamnus ilicifolia*	100	10	10	10
	RIMA	*Ribes malvaceum*	100	6	6	6
	ERPI7	*Ericameria pinifolia*	100	0.2	0.2	0.2
	SAME5	*Sambucus mexicana*	100	0.2	0.2	0.2
Herb	BRDI3	*Bromus diandrus*	100	15	15	15
	BOIN3	*Bowlesia incana*	100	2	2	2
	PHDI	*Phacelia distans*	100	2	2	2
	SCCA2	*Scrophularia californica*	100	1	1	1
	AMME	*Amsinckia menziesii*	100	0.2	0.2	0.2
	EUCH	*Eucrypta chrysanthemifolia*	100	0.2	0.2	0.2
	GNBI	*Gnaphalium bicolor*	100	0.2	0.2	0.2

***Ribes quercetorum* Unique Stands (Oak Gooseberry)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
One stand of *Ribes quercetorum* Shrubland forms an intermittent shrub layer (60%), where *Ribes quercetorum* dominates. The shrub layer is frequently in two strata, with low shrubs at 1-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is open (20%) at 0-0.5m tall. Total vegetation cover is 80%.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 2,102 ft.
Aspect: NW
Slope: steep, 36 degrees
Topography: convex, lower slope
Litter Cover: 40%
Rock Cover: 21%
Bare Ground: 38%
Parent Material: Mesozoic granite
Soil Texture: medium to very fine sandy loam

The *Ribes quercetorum* stand was sampled in the Perris Valley and Hills (M262Bk) Subsection on a north-trending slope of low elevation.

Samples used to describe alliance: (n=1) WRIV0646

RANK: G2 S2?

GLOBAL DISTRIBUTION
Alliance: South Coast (including Western Riverside County: Perris Valley and Hills), though full distribution is not known

REFERENCES
No reference citations

***Ribes quercetorum* Unique Stands**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	RIQU	*Ribes quercetorum*	100	50	50	50
	RHIL	*Rhamnus ilicifolia*	100	10	10	10
	ARCA11	*Artemisia californica*	100	5	5	5
	TODI	*Toxicodendron diversilobum*	100	4	4	4
	RHTR	*Rhus trilobata*	100	1	1	1
	ERFA2	*Eriogonum fasciculatum*	100	0.2	0.2	0.2
	ERCO25	*Eriophyllum confertiflorum*	100	0.2	0.2	0.2
	SAME5	*Sambucus mexicana*	100	0.2	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	100	10	10	10
	EUCH	*Eucrypta chrysanthemifolia*	100	4	4	4
	MAMA8	*Marah macrocarpus*	100	3	3	3
	PHDI	*Phacelia distans*	100	3	3	3
	DICA14	*Dichelostemma capitatum*	100	0.2	0.2	0.2

***Salix lasiolepis* Alliance (Arroyo Willow)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Salix lasiolepis* Shrubland form an open to intermittent shrub layer (33-60%, mean 43.3%), where *Salix lasiolepis* dominates as a shrub. The shrub layer is often in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 2-10m tall. The herbaceous layer is open (8-33%, mean 21.7%) at 0-0.5m tall. Emergent trees occur occasionally at sparse cover (0.2-5% cover, mean 1.8%) at 10-15m tall, including *Platanus racemosa* or *Quercus agrifolia*. Total vegetation cover is 50-63% (mean 56.7%).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,786-4,516 ft., mean 3,268 ft.
Aspect: SW and SE
Slope: gentle, range 1-3 degrees, mean 2 degrees
Topography: concave or flat, bottom slopes
Litter Cover: range 14-85%, mean 51.3%
Rock Cover: range 4-61%, mean 24.7%
Bare ground: range 10-30%, mean 20%
Parent Material: alluvium from parent material that is Mesozoic granite or sedimentary
Soil Texture: coarse loamy sand, moderately fine clay loam, moderately fine silty clay loam

The *Salix lasiolepis* Alliance was sampled in intermittently flooded riparian corridors in low to middle elevations in the Santa Ana Mountains (M262Bf) and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections.

Samples used to describe alliance: (n=3) WRIV0359, WRIV0710, WRIV0934

RANK: G2 S2, G3 S2, G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: North and Central Coasts (including Los Padres National Forest and Point Reyes), Central Valley, Klamath foothills, Cascade Range foothills, mountains and foothills of Sierra Nevada, Southern California (including Santa Monica Mountains and Western Riverside County), Anza-Borrego Desert, Great Basin, Baja California

REFERENCES
Borchert 2004, CDFG 1998, CNPS and CDFG 2005b, Evens and San In publication, NatureServe 2003b, Potter 2003, Sawyer and Keeler-Wolf 1995, Smith 1998, Zembal 1989

Salix lasiolepis

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	QUAG-t	*Quercus agrifolia*	33.3	1.7	5	5
	PLRA-t	*Platanus racemosa*	33.3	0.1	0.2	0.2
Shrub	SALA6-m	*Salix lasiolepis*	100	37.3	28	53
	BASA4	*Baccharis salicifolia*	66.7	4	2	10
	ARTR2	*Artemisia tridentata*	66.7	2.1	0.2	6
	SAEX	*Salix exigua*	33.3	0.3	1	1
	LOSU2	*Lonicera subspicata*	33.3	0.1	0.2	0.2
	ROCA2	*Rosa californica*	33.3	0.1	0.2	0.2
	SAAP2	*Salvia apiana*	33.3	0.1	0.2	0.2
Herb	BRTE	*Bromus tectorum*	66.7	6	6	12
	BRDI3	*Bromus diandrus*	66.7	2.3	2	5
	ARDO3	*Artemisia douglasiana*	33.3	4	12	12
	ERCI6	*Erodium cicutarium*	33.3	2	6	6
	AVENA	*Avena*	33.3	1.7	5	5
	BRHO2	*Bromus hordeaceus*	33.3	1.7	5	5
	JUNCU	*Juncus*	33.3	1.3	4	4
	VUMY	*Vulpia myuros*	33.3	1.3	4	4
	CRIN8	*Cryptantha intermedia*	33.3	1	3	3
	EPILO	*Epilobium*	33.3	0.7	2	2
	NAPU4	*Nassella pulchra*	33.3	0.7	2	2
	ARDR4	*Artemisia dracunculus*	33.3	0.3	1	1
	DEPI	*Descurainia pinnata*	33.3	0.3	1	1
	ELGL	*Elymus glaucus*	33.3	0.3	1	1
	JUME4	*Juncus mexicanus*	33.3	0.3	1	1
	MURI2	*Muhlenbergia rigens*	33.3	0.3	1	1
	TYDO	*Typha domingensis*	33.3	0.3	1	1
	AMPS	*Ambrosia psilostachya*	33.3	0.1	0.2	0.2
	CHGL	*Chaenactis glabriuscula*	33.3	0.1	0.2	0.2
	DISP	*Distichlis spicata*	33.3	0.1	0.2	0.2
	HIIN3	*Hirschfeldia incana*	33.3	0.1	0.2	0.2
	LECO12	*Leymus condensatus*	33.3	0.1	0.2	0.2
	LUBI	*Lupinus bicolor*	33.3	0.1	0.2	0.2

***Salvia apiana* Alliance (White Sage)**

ASSOCIATIONS
Salvia apiana-Encelia farinosa

LOCAL VEGETATION DESCRIPTION
Stands of *Salvia apiana* Shrubland form an open shrub layer (10-30%, mean 21%), where *Salvia apiana* usually dominates. Shrubs occasionally occur in two different strata, with low shrubs at 0.5-1m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to continuous (27-85%, mean 50.5%) at 0-0.5m tall. Total vegetation cover is 48-90% (mean 65.8%).

In the ***Salvia apiana-Encelia farinosa* Association** *Salvia apiana* and *Encelia farinosa* are consistently present in the shrub overstory, where *Salvia apiana* is often dominant, but occasionally co-dominates with *Encelia farinosa*. A variety of shrubs (e.g., *Eriogonum fasciculatum*, *Artemisia californica*, *Bebbia juncea*, *Malosma laurina*) intermix in the shrub layer at low cover. *Platanus racemosa* is occasionally present in the tree overstory at trace cover. The most common herbs are native species *Salvia columbariae*, *Mirabilis californica*, *Eschscholzia californica*, and *Phacelia minor* and non-native species *Hirschfeldia incana*, and *Bromus madritensis*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,422-1,924 ft., mean 1,682 ft.
Aspect: SE and SW
Slope: somewhat steep to steep, range 22-55 degrees, mean 33.3 degrees
Topography: more often undulating, less often concave, lower to upper slopes
Litter Cover: range 5-20%, mean 10.5%
Rock Cover: range 40-80%, mean 60.3%
Bare ground: range 10-50%, mean 26.3%
Parent Material: Mesozoic granite, sedimentary, metavolcanic
Soil Texture: moderately coarse sandy loam, moderately fine clay loam

The *Salvia apiana* Alliance was sampled only in the Perris Valley and Hills (M262Bk) Subsection at low elevation hills on south-trending slopes that are usually steep.

Samples used to describe alliance: (n=4) WRIV0545, WRIV0547, WRIV0560, WRIV0561

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: South Coast, montane Transverse Ranges and Peninsular Ranges (including Western Riverside County), Channel Islands, Baja California

Salvia apiana-Encelia farinosa Association: Peninsular Ranges (Western Riverside County: Perris Valley and Hills), though full distribution is not known

REFERENCES
Evens and San In publication, Sawyer and Keeler-Wolf 1995

***Salvia apiana* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PLRA-t	*Platanus racemosa*	25	0.3	1	1
Shrub	SAAP2	*Salvia apiana*	100	11.5	2	20
	ENFA	*Encelia farinosa*	100	3.8	1	8
	ERFA2	*Eriogonum fasciculatum*	75	1.8	1	4
	ARCA11	*Artemisia californica*	75	0.8	0.2	2
	BEJU	*Bebbia juncea*	50	0.8	0.2	3
	MALA6	*Malosma laurina*	25	3.8	15	15
	LOSC2	*Lotus scoparius*	25	0.3	1	1
	SALA6-t	*Salix lasiolepis*	25	0.3	1	1
	SAME3	*Salvia mellifera*	25	0.3	1	1
	BASA4	*Baccharis salicifolia*	25	0.1	0.2	0.2
	KEAN	*Keckiella antirrhinoides*	25	0.1	0.2	0.2
	NIGL	*Nicotiana glauca*	25	0.1	0.2	0.2
Herb	HIIN3	*Hirschfeldia incana*	100	6.5	2	12
	SACO6	*Salvia columbariae*	100	2.3	1	4
	MICA6	*Mirabilis californica*	100	1	0.2	2
	ESCA2	*Eschscholzia californica*	75	11.5	3	40
	PHMI	*Phacelia minor*	75	7.8	2	25
	BRMA3	*Bromus madritensis*	75	2.3	0.2	8
	ERODI	*Erodium*	50	16.3	25	40
	PHACE	*Phacelia*	50	1.5	1	5
	DICA14	*Dichelostemma capitatum*	50	0.6	0.2	2
	CAHE11	*Caulanthus heterophyllus*	50	0.3	0.2	1
	CHAR	*Chaenactis artemisiifolia*	50	0.1	0.2	0.2
	SCBA	*Schismus barbatus*	25	1.5	6	6
	CRIN8	*Cryptantha intermedia*	25	0.8	3	3
	CRYPT	*Cryptantha*	25	0.5	2	2
	ERCI6	*Erodium cicutarium*	25	0.3	1	1
	MAMA8	*Marah macrocarpus*	25	0.3	1	1
	CAMA24	*Calystegia macrostegia*	25	0.1	0.2	0.2
	HELIA3	*Helianthus*	25	0.1	0.2	0.2
	LUPIN	*Lupinus*	25	0.1	0.2	0.2

***Salvia mellifera* Alliance (Black Sage)**

ASSOCIATIONS
Salvia mellifera
Salvia mellifera-Lotus scoparius
Salvia mellifera-Rhus ovata

LOCAL VEGETATION DESCRIPTION
Stands of *Salvia mellifera* Shrubland form an open to intermittent shrub layer (12-58%, mean 33.6%), where *Salvia mellifera* usually dominates. Shrubs occasionally occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to continuous (0.2-72%, mean 18.1%) at 0-1m tall, and includes a variety of native and non-native species (see species table). Total vegetation cover is 13-88% (mean 47.6%).

In the ***Salvia mellifera* Association,** *Salvia mellifera* is usually dominant shrub in the overstory. *Eriogonum fasciculatum* is consistently present, usually as a sub-dominant shrub. A variety of other coastal sage and chaparral species frequently intermix in the shrub layer as sub-dominants. Some of these species include *Artemisia californica*, *Ceanothus crassifolius*, *Adenostoma fasciculatum*, *Keckiella antirrhinoides*, and *Encelia farinosa*.

In the ***Salvia mellifera-Lotus scoparius* Association,** *Lotus scoparius* is consistently present, usually as a sub-dominant. Other species frequently co-occur in the shrub layer, the common species being *Artemisia californica*, *Eriogonum fasciculatum*, *Yucca whipplei*, and *Rhus ovata*.

In the ***Salvia mellifera-Rhus ovata* Association,** *Rhus ovata* is consistently present as a co-dominant or sub-dominant shrub. *Eriogonum fasciculatum*, *Artemisia californica*, *Encelia farinosa*, *Adenostoma fasciculatum* and *Ceanothus crassifolius* are occasionally to often present as sub-dominant shrubs.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,425-3,461 ft., mean 2,103 ft.
Aspect: variable, but more often NE and NW
Slope: moderate to steep, range 12-40 degrees, mean 24.5 degrees
Topography: more often undulating or convex, less often flat, lower to top slopes
Litter Cover: range 0-90%, mean 22.5 %
Rock Cover: range 4-78%, mean 26.5%
Bare ground: range 3-85%, mean 44.9%
Parent Material: sedimentary, Mesozoic granite, gabbro and diorite, metavolcanic, alluvium
Soil Texture: varies from coarse loamy sand to moderately fine clay loam

The *Salvia mellifera* Alliance was sampled in the Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections.

Samples used to describe alliance: (n=19) WRAA.111, WRAA.160, WRIV0007, WRIV0090, WRIV0099, WRIV0117, WRIV0130, WRIV0192, WRIV0360, WRIV0474, WRIV0479, WRIV0510, WRIV0519, WRIV0553, WRIV0568, WRIV0575, WRIV0608, WRIV0998, WRIV1020

RANK: G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Central Coast (including Los Padres National Forest, Mount Diablo, Santa Clara, and San Benito Counties), South Coast (including Orange County), low elevation Transverse Ranges, montane Transverse and Peninsular Ranges (including Western Riverside County), Channel Islands, San Diego County to Alameda County (J. Evens, personal observation).

Salvia mellifera Association: North Central Coast (Santa Clara County), Mount Diablo. South Coast and Transverse and Peninsular Ranges (Santa Monica Mountains, Orange County; Western Riverside County: Santa Ana Mountains, Perris Valley and Hills, San Jacinto Foothills Subsections)
Salvia mellifera-Lotus scoparius Association: Peninsular Ranges: (Western Riverside County: Santa Ana Mountains, Perris Valley and Hills, San Jacinto Foothills Subsections), though full distribution is not known
Salvia mellifera-Rhus ovata Association: Peninsular Ranges (Western Riverside County: Perris Valley and Hills and San Jacinto Foothills Subsections), western Transverse Ranges (Santa Monica Mountains), though full distribution is not known

REFERENCES

Borchert et al. 2004, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Desimone and Burk 1992, Ertter and Bowerman 2002, Evens and San 2004, Evens and San In publication, Holland 1986, Malanson 1984, Sawyer and Keeler-Wolf 1995, White 1994

***Salvia mellifera* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	SAME3	*Salvia mellifera*	100	21.5	4	45
	ERFA2	*Eriogonum fasciculatum*	78.9	4	0.2	19
	ARCA11	*Artemisia californica*	63.2	2.7	0.2	13
	RHOV	*Rhus ovata*	52.6	2.1	0.2	16
	ADFA	*Adenostoma fasciculatum*	36.8	1.1	0.2	5
	LOSC2	*Lotus scoparius*	36.8	1	0.2	10
	ENFA	*Encelia farinosa*	36.8	0.8	0.2	7
	YUSC2	*Yucca schidigera*	31.6	0.2	0.2	1
	CECR	*Ceanothus crassifolius*	26.3	0.8	0.2	13
	RHCR	*Rhamnus crocea*	21.1	0.6	0.2	6
	YUWH	*Yucca whipplei*	21.1	0.1	0.2	1
Herb	BRMA3	*Bromus madritensis*	57.9	3.4	0.2	22
	HIIN3	*Hirschfeldia incana*	57.9	3.2	0.2	25
	SCBA	*Schismus barbatus*	26.3	0.5	0.2	5
	ERCI6	*Erodium cicutarium*	21.1	1.1	0.2	18
	AMME	*Amsinckia menziesii*	15.8	1.1	0.2	20
	HEFA	*Hemizonia fasciculata*	15.8	0.4	2	3
Cryptogam	MOSS	Moss	15.8	0.7	0.2	7

***Simmondsia chinensis* Alliance (Jojoba)**

ASSOCIATIONS
Simmondsia chinensis-Eriogonum fasciculatum-Opuntia parryi

LOCAL VEGETATION DESCRIPTION
Stands of *Simmondsia chinensis* Shrubland form an open to intermittent shrub layer (12-47%, mean 29.8%), where *Simmondsia chinensis* usually dominates. Shrubs consistently occur in two different strata, with low shrubs at 0.5-1m tall and tall shrubs at 1-5m tall. The herbaceous layer is open (0.2-8%, mean 3.4%) at 0-0.5m tall. Total vegetation cover is 16-48% (mean 31.1%).

In the ***Simmondsia chinensis-Eriogonum fasciculatum-Opuntia parryi* Association,** *Simmondsia chinensis* is usually dominant, and *Eriogonum fasciculatum* is sub-dominant in the overstory shrub layer. Occasionally, the two species may be co-dominant. *Opuntia parryi* is characteristically present as a sub-dominant shrub, while *Encelia actoni*, *Rhus ovata*, *Lotus scoparius*, and *Yucca schidigera* are occasionally sub-dominant. The most common species in the herb understory include natives *Amsinckia menziesii* and *Salvia columbariae* and non-native *Bromus madritensis*. In this association, *Eriogonum fasciculatum* is sub-dominant or co-dominant. In contrast, in the *Eriogonum fasciculatum-Simmondsia chinensis-Opuntia parryi* Association, *Eriogonum fasciculatum* is dominant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,771-2,882 ft., mean 2,236 ft.
Aspect: variable
Slope: gentle to very steep, range 4-60 degrees, mean 15.1 degrees
Topography: more often flat and undulating, less often concave, bottom to upper slopes
Litter Cover: 0%, mean 0%
Rock Cover: range 65-93%, mean 74.4%
Bare ground: range 7-30%, mean 19.2%
Parent Material: more often Mesozoic granite, less often alluvium
Soil Texture: coarse loamy sand, medium loam, medium to very fine sandy loam

The *Simmondsia chinensis* Alliance was sampled in the Perris Valley and Hills (M262Bk) and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections on well-drained soils. Sampling sites were located north of Aguanga, near Wilson and Tule Creeks, and surrounding Sage Road.

Samples used to describe alliance: (n=8) WRIV0029, WRIV0038, WRIV0047, WRIV0091, WRIV0098, WRIV0119, WRIV0205, WRIV0206

RANK: G4 S4 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance: South Coast and Peninsular Ranges (including eastern Western Riverside County), Mojave Desert, though full distribution is not known

Simmondsia chinensis-Eriogonum fasciculatum-Opuntia parryi Association: South Coast and Peninsular Ranges (Western Riverside County: Perris Valley and Hills and San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known

REFERENCES
Thomas et al. 2004

***Simmondsia chinensis* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	SICH	*Simmondsia chinensis*	100	15	9	26
	ERFA2	*Eriogonum fasciculatum*	100	5.4	1	10
	OPPA2	*Opuntia parryi*	87.5	3.8	0.2	9
	ENAC	*Encelia actoni*	50	1.9	2	8
	RHOV	*Rhus ovata*	50	0.1	0.2	0.2
	LOSC2	*Lotus scoparius*	37.5	1.4	1	6
	YUSC2	*Yucca schidigera*	37.5	0.2	0.2	1
	ARCA11	*Artemisia californica*	25	1.3	3	7
	ENFA	*Encelia farinosa*	25	1	0.2	8
	GUSA2	*Gutierrezia sarothrae*	25	0.4	0.2	3
	SAME3	*Salvia mellifera*	25	0.3	0.2	2
	ECEN	*Echinocereus engelmannii*	25	0.1	0.2	0.2
	OPBA2	*Opuntia basilaris*	25	0.1	0.2	0.2
Herb	BRMA3	*Bromus madritensis*	62.5	2	1	7
	AMME	*Amsinckia menziesii*	50	0.5	0.2	2
	SACO6	*Salvia columbariae*	25	0.2	0.2	1

***Suaeda moquinii* Alliance (Bush Seepweed)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Suaeda moquinii* Shrubland form an open to continuous shrub layer (6-75%, mean 40.5%) at 0-1m tall, where *Suaeda moquinii* dominates. The herbaceous layer is open to intermittent (6-75%, mean 40.5%) at 0-0.5m tall. Total vegetation cover is 8-75% (mean 41.5%).

Atriplex coronata var. *notatior*, a CNPS List 1B species (CNPS 2005), was found in 1 of 2 surveys of the *Suaeda moquinii* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,412-1,422 ft., mean 1,417 ft.
Aspect: flat
Slope: flat, 0 degrees, mean 0 degrees
Topography: flat, bottom slopes
Litter Cover: 2%, mean 2%
Rock Cover: 0%, mean 0%
Bare Ground: 95%, mean 95%
Parent Material: silty alluvium
Soil Texture: moderately fine silty clay loam, fine silty clay

The *Suaeda moquinii* Alliance was sampled only in the Perris Valley and Hills (M262Bk) Subsection in the San Jacinto Wildlife Area on wetland clay soils of alkali flats/scalds.

Samples used to describe alliance: (n=2) WRIV0970, WRIV0973

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: Central Valley, Southern California (including Western Riverside County: Perris Valley and Hills), Transmontane California (including Anza-Borrego and Mojave Deserts)

REFERENCES
CDFG 1998, CNPS 2005, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004

***Suaeda moquinii* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	SUMO	*Suaeda moquinii*	100	16.5	5	28
Herb	HOMA2	*Hordeum marinum*	100	8.6	0.2	17
	SISYM	*Sisymbrium*	100	5.6	0.2	11
	PHALA2	*Phalaris*	100	0.6	0.2	1
	SASU2	*Salicornia subterminalis*	100	0.2	0.2	0.2
	ANCO2	*Anthemis cotula*	50	5.5	11	11
	AECY	*Aegilops cylindrica*	50	5	10	10
	ATRIP-I	*Atriplex*	50	5	10	10
	SPERG2	*Spergularia*	50	2.5	5	5
	MENO2	*Mesembryanthemum nodiflorum*	50	2	4	4
	LASE	*Lactuca serriola*	50	1.5	3	3
	RUCR	*Rumex crispus*	50	0.5	1	1
	ATCON	*Atriplex coronata* var. *notatior*	50	0.1	0.2	0.2
	POMO5	*Polypogon monspeliensis*	50	0.1	0.2	0.2
	SCBA	*Schismus barbatus*	50	0.1	0.2	0.2

***Tamarix* spp. Alliance (Tamarisk)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Tamarix* spp. Shrubland form an open shrub layer (6-10%, mean 8%) at 0.5-2m tall, where *Tamarix* spp. dominates. The herbaceous layer is open to intermittent (23-32%, mean 27.5%) at 0.5-2m tall. Total vegetation cover is 33-35% (mean 34%).

In this alliance, *Salix gooddingii* may be regenerating in the shrub layer at trace cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,341-1,394 ft., mean 1,368 ft.
Aspect: SE
Slope: gentle, range 1-2 degrees, mean 1.5 degrees
Topography: flat, bottom slopes
Litter Cover: range 5-15%, mean 10%
Rock Cover: range 1-2%, mean 1.5%
Bare ground: range 80-91%, mean 85.5%
Parent Material: alluvium from parent material of Mesozoic granite
Soil Texture: medium to very fine loamy sand, medium silt

The *Tamarix* spp. Alliance was sampled only in the Perris Valley and Hills (M262Bk) Subsection, in regions that have been repeatedly disturbed (e.g., lake margins, aqueducts).

Samples used to describe alliance: (n=2) WRIV0636, WRIV0637

RANK: none, invasive

GLOBAL DISTRIBUTION
Alliance: North Coast, Central Coast (including San Benito County), Central Valley, southern Sierra Nevada foothills, southern montane Sierra Nevada, South Coast, Peninsular Ranges (including Western Riverside County: Perris Valley and Hills), Mojave Desert, Colorado Desert, Anza-Borrego Desert

REFERENCES
CDFG 1998, CNPS and CDFG 2005a, Evens and San In publication, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004

***Tamarix spp*. Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Understory	SAGO-m	*Salix gooddingii*	50	0.5	1	1
Shrub	TAMAR2	*Tamarix*	100	7.5	6	9
	BASA4	*Baccharis salicifolia*	50	0.5	1	1
Herb	XAST	*Xanthium strumarium*	100	13.5	4	23
	ROPA2	*Rorippa palustris*	100	9	2	16
	MEIN2	*Melilotus indicus*	100	1.6	0.2	3
	POLYG4	*Polygonum*	50	6	12	12
	CHGLS2	*Chenopodium glaucum* subsp. *salinum*	50	0.5	1	1
	HIIN3	*Hirschfeldia incana*	50	0.5	1	1
	BRMA3	*Bromus madritensis*	50	0.1	0.2	0.2
	ERODI	*Erodium*	50	0.1	0.2	0.2
	GNAPH	*Gnaphalium*	50	0.1	0.2	0.2
	LASE	*Lactuca serriola*	50	0.1	0.2	0.2
	LACA7	*Lasthenia californica*	50	0.1	0.2	0.2
	SOOL	*Sonchus oleraceus*	50	0.1	0.2	0.2

***Amsinckia menziesii* Alliance (Menzies' Fiddleneck)**

ASSOCIATIONS
Amsinckia menziesii-Erodium spp.

LOCAL VEGETATION DESCRIPTION
Stands of *Amsinckia menziesii* form an intermittent to continuous herbaceous layer (50-95%, mean 74.5%) at 0-1 tall, where *Amsinckia menziesii* is often dominant or co-dominant. The shrub layer is open (0.2-3%, mean 1.6%) at 0.5-5m tall. Total vegetation cover is 50-95% (mean 74.5%).

In the ***Amsinckia menziesii-Erodium* spp. Association,** *Amsinckia menziesii* is consistently present at low to moderate cover with non-native species of *Erodium* (e.g., *Erodium cicutarium*, *Erodium moschatum*, *Erodium botrys*). Other herb species, such as natives *Plagiobothrys collinus* and *Dichelostemma capitatum* and non-natives *Bromus madritensis*, *Bromus diandrus*, *Hordeum murinum* and *Hirschfeldia incana* are occasionally to often present. A variety of overstory coastal sage and chaparral shrubs may be present at trace cover (e.g., *Eriogonum fasciculatum*, *Encelia farinosa*, *Artemisia californica*, *Adenostoma fasciculatum*, *Ericameria palmeri*).

This annual association fluctuates depending primarily on the amount of precipitation from year to year. It is uncertain whether in some years it is masked by other native or non-native species. As with other annual vegetation, phenological variation from year to year may radically shift its appearance and size of stands.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 997-2,961 ft., mean 1,799 ft.
Aspect: variable
Slope: gentle to somewhat steep, range 2-20 degrees, mean 9.33 degrees
Topography: more often undulating, less often flat, bottom to top slopes
Litter Cover: range 4-78%, mean 29.8%
Rock Cover: range 3-50%, mean 17.5%
Bare ground: range 15-85%, mean 49%
Parent Material: Mesozoic granite, sedimentary
Soil Texture: varies from coarse loamy sand to moderately fine sandy clay loam

The *Amsinckia menziesii* Alliance was sampled on gentle to steep, lower hills within the Fontana Plain - Calimesa Terraces (M262Bj, Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections.

Samples used to describe alliance: (n=6) WRIV0439, WRIV0461, WRIV0498, WRIV0511, WRIV0540, WRIV0619

RANK: G5 S5

GLOBAL DISTRIBUTION
Alliance: South Coast and Peninsular Ranges (including Western Riverside County)

Amsinckia menziesii-Erodium spp. Association: South Coast and Peninsular Ranges (Western Riverside County: Fontana Plain - Calimesa Terraces, Perris Valley and Hills, San Jacinto Foothills - Cahuilla Mountains Subsections), though full distribution is not known

REFERENCES

No reference citations

***Amsinckia menziesii* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	SAME5	*Sambucus mexicana*	33.3	0.2	0.2	1
	TECO2	*Tetradymia comosa*	33.3	0.2	0.2	1
Herb	AMME	*Amsinckia menziesii*	100	34.3	6	50
	ERCI6	*Erodium cicutarium*	66.7	7.2	6	15
	BRMA3	*Bromus madritensis*	66.7	3.7	2	10
	ERODI	*Erodium*	50	11.7	20	30
	BRDI3	*Bromus diandrus*	33.3	12.5	35	40
	HOMU	*Hordeum murinum*	33.3	4.8	1	28
	PLCO13	*Plagiobothrys collinus*	33.3	2.5	5	10
	HIIN3	*Hirschfeldia incana*	33.3	0.8	2	3
	DICA14	*Dichelostemma capitatum*	33.3	0.5	0.2	3
	PHRA2	*Phacelia ramosissima*	16.7	2	12	12
	CRIN8	*Cryptantha intermedia*	16.7	1	6	6
	HOMA2	*Hordeum marinum*	16.7	1	6	6
	PHACE	*Phacelia*	16.7	0.8	5	5
	HEFA	*Hemizonia fasciculata*	16.7	0.7	4	4
	PELI	*Pectocarya linearis*	16.7	0.7	4	4
	LACA7	*Lasthenia californica*	16.7	0.2	1	1
	MEIM	*Melica imperfecta*	16.7	0.2	1	1
	SCBA	*Schismus barbatus*	16.7	0.2	1	1
	AVENA	*Avena*	16.7	0	0.2	0.2
	AVBA	*Avena barbata*	16.7	0	0.2	0.2
	CACI2	*Calandrinia ciliata*	16.7	0	0.2	0.2
	CRCA5	*Croton californicus*	16.7	0	0.2	0.2
	GILA2	*Gilia latifolia*	16.7	0	0.2	0.2
	LUBI	*Lupinus bicolor*	16.7	0	0.2	0.2
	MAVU	*Marrubium vulgare*	16.7	0	0.2	0.2
	NEME	*Nemophila menziesii*	16.7	0	0.2	0.2
	PLAGI	*Plagiobothrys*	16.7	0	0.2	0.2
	SISYM	*Sisymbrium*	16.7	0	0.2	0.2
	SOXA	*Solanum xanti*	16.7	0	0.2	0.2
	STEPH	*Stephanomeria*	16.7	0	0.2	0.2

***Anemopsis californica* Alliance (Yerba Mansa)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
In one stand of *Anemopsis californica,* the herbaceous layer is open (30%) at 0.5-1m tall, and *Anemopsis californica* is present at sparse cover. A variety of seasonal species (some wetland and some upland) intermix in the herb layer (e.g., *Holocarpha virgata*). Total vegetation cover is 30%.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 1,900 ft.
Aspect: flat
Slope: flat, 0 degrees
Topography: flat, bottom slope
Litter Cover: 85%
Rock Cover: 0%
Bare Ground: 10%
Parent Material: silty alluvium from sedimentary parent material
Soil Texture: medium silt loam

The *Anemopsis californica* Alliance was sampled in a seep and channel terrace, which was only within the Santa Ana Mountains (M262Bf) Subsection.

Samples used to describe alliance: (n=1) WRIV0992

RANK: G4 S2

GLOBAL DISTRIBUTION
Alliance: Potentially found from the South Coast (including Western Riverside and San Diego Counties), north to Central Coast, and east to the Mojave Desert and beyond California

REFERENCES
Evens and San In publication

***Anemopsis californica* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Herb	HOVI	*Holocarpha virgata*	100	15	15	15
	JURU	*Juncus rugulosus*	100	8	8	8
	ERODI	*Erodium*	100	5	5	5
	ANCA10	*Anemopsis californica*	100	3	3	3
	LOMU	*Lolium multiflorum*	100	2	2	2
	EPILO	*Epilobium*	100	1	1	1
	LASE	*Lactuca serriola*	100	1	1	1
	RUCR	*Rumex crispus*	100	1	1	1
	BRHO2	*Bromus hordeaceus*	100	0.2	0.2	0.2
	CAREX	*Carex*	100	0.2	0.2	0.2
	SIBE	*Sisyrinchium bellum*	100	0.2	0.2	0.2

***Arundo donax* Alliance (Giant Reed)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Arundo donax* form an intermittent to continuous herbaceous layer (52-93, mean 72.5%) at 2-5m tall, where *Arundo donax* dominates. The shrub layer is open (15%, mean 15%) at 1-5m tall. Trees occurred in one sample plot (17% cover, mean 17%) at 5-10m tall, and included *Salix gooddingii* and non-natives *Fraxinus uhdei* and *Phoenix dactylifera*. Total vegetation cover is 80-93% (mean 86.5%).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 638-668 ft., mean 653 ft.
Aspect: flat
Slope: flat, range 0 degrees, mean 0 degrees
Topography: concave or flat, bottom slopes
Litter Cover: 75-88%, mean 81.5%
Rock Cover: 0%, mean 0%
Bare Ground: 8-20%, mean 14%
Parent Material: alluvium
Soil Texture: medium to very fine loamy sand, moderately coarse sandy loam

The *Arundo donax* Alliance was sampled in the Fontana Plain - Calimesa Terraces (M262Bj) Subsection at low elevation riparian sites that may be disturbed by adjacent agriculture.

Samples used to describe alliance: (n=2) WRIV0642, WRIV0737

RANK: none, invasive

GLOBAL DISTRIBUTION
Alliance: outer North Coast, Central Coast, Central Valley (including Solano County), Sierra Nevada foothills, South Coast (including Western Riverside County), montane Transverse Ranges, Mojave Desert, Colorado Desert; native to Europe

REFERENCES
Bossard 2000, CDFG 2000, Evens and San In publication, Sawyer and Keeler-Wolf 1995, Zembal 1989

***Arundo donax* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	FRAXI-t	*Fraxinus*	50	8.5	17	17
	PHDA4	*Phoenix dactylifera*	50	0.1	0.2	0.2
	SAGO-t	*Salix gooddingii*	50	0.1	0.2	0.2
Shrub	RICO3	*Ricinus communis*	50	7.5	15	15
	VIGI2	*Vitis girdiana*	50	1.5	3	3
	BASA4	*Baccharis salicifolia*	50	1	2	2
	SALA6-m	*Salix lasiolepis*	50	0.5	1	1
Herb	ARDO4	*Arundo donax*	100	55	50	60
	LELA2	*Lepidium latifolium*	50	8.5	17	17
	URDI	*Urtica dioica*	50	8	16	16
	HOMA2	*Hordeum marinum*	50	1	2	2
	AMME	*Amsinckia menziesii*	50	0.1	0.2	0.2
	COMA2	*Conium maculatum*	50	0.1	0.2	0.2
	RASA2	*Raphanus sativus*	50	0.1	0.2	0.2

***Bromus tectorum* Alliance (Cheatgrass)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands dominated by *Bromus tectorum* form an open to continuous herbaceous layer (5-85%, mean 49.3%) at 0-1m tall, where *Bromus tectorum* is present at low cover. The shrub layer is open (2-4%, mean 3%) at 0.5-5m tall. Emergent trees occur occasionally at trace cover (1-2%, mean 1.5%) at 5-35m tall, and may include *Pinus jeffreyi*. Total vegetation cover is 70-85% (mean 50%).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1,480-4,977 ft., mean 3,327 ft.
Aspect: flat or mildly SE
Slope: flat to gentle, range 0-3 degrees, mean 1 degree
Topography: flat, bottom or mid slopes
Litter Cover: range 0-45%, mean 28.3%
Rock Cover: range 25-45%, mean 33.3%
Bare ground: range 27-60%, mean 39%
Parent Material: Mesozoic granite, mixed granitic and metamorphic
Soil Texture: medium to very fine sandy loam

The *Bromus tectorum* Alliance was sampled across low to mid elevation flats in the Perris Valley and Hills (M262Bk), San Jacinto Foothills - Cahuilla Mountains (M262Bl), and San Jacinto Mountains (M262Bm) Subsections.

Samples used to describe alliance: (n=3) WRIV0041, WRIV0847, WRIV0955

RANK: none, invasive

GLOBAL DISTRIBUTION
Alliance: Cismontane California (including Western Riverside County, Anza-Borrego Desert), Transmontane California, intermountain West

REFERENCES
Bossard 2000, CDFG 1998, Sawyer and Keeler-Wolf 1995

***Bromus tectorum* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	PIJE-t	*Pinus jeffreyi*	33.3	0.7	2	2
Tree Understory	QUWI2-m	*Quercus wislizeni*	33.3	0.3	1	1
Shrub	ARPU5	*Arctostaphylos pungens*	33.3	1	3	3
	ERPAP	*Ericameria palmeri* var. *pachylepis*	33.3	0.3	1	1
	RHTR	*Rhus trilobata*	33.3	0.3	1	1
	SAME5	*Sambucus mexicana*	33.3	0.3	1	1
	CLEMA	*Clematis*	33.3	0.1	0.2	0.2
	ENAC	*Encelia actoni*	33.3	0.1	0.2	0.2
	ERFA2	*Eriogonum fasciculatum*	33.3	0.1	0.2	0.2
	OPPA2	*Opuntia parryi*	33.3	0.1	0.2	0.2
	YUSC2	*Yucca schidigera*	33.3	0.1	0.2	0.2
Herb	BRTE	*Bromus tectorum*	100	13.4	0.2	30
	HIIN3	*Hirschfeldia incana*	66.7	2.3	3	4
	BRMA3	*Bromus madritensis*	66.7	1.7	0.2	5
	ERSE3	*Eremocarpus setigerus*	33.3	9.3	28	28
	VUMY	*Vulpia myuros*	33.3	5	15	15
	ERCI6	*Erodium cicutarium*	33.3	3.3	10	10
	LUPIN	*Lupinus*	33.3	3.3	10	10
	BRDI3	*Bromus diandrus*	33.3	2.7	8	8
	POPR	*Poa pratensis*	33.3	2.3	7	7
	TRMI4	*Trifolium microcephalum*	33.3	2.3	7	7
	SIMA2	*Sidalcea malviflora*	33.3	1.7	5	5
	BRHO2	*Bromus hordeaceus*	33.3	1.3	4	4
	JUBA	*Juncus balticus*	33.3	1	3	3
	KOMA	*Koeleria macrantha*	33.3	1	3	3
	MIBR4	*Mimulus brevipes*	33.3	1	3	3
	ARLU	*Artemisia ludoviciana*	33.3	0.7	2	2
	CRIN8	*Cryptantha intermedia*	33.3	0.7	2	2
	ACMI2	*Achillea millefolium*	33.3	0.3	1	1
	BRCA5	*Bromus carinatus*	33.3	0.3	1	1
	CAMIS	*Camissonia*	33.3	0.3	1	1
	SISYM	*Sisymbrium*	33.3	0.3	1	1
	ARDR4	*Artemisia dracunculus*	33.3	0.1	0.2	0.2
	CRCA5	*Croton californicus*	33.3	0.1	0.2	0.2
	CUFO	*Cucurbita foetidissima*	33.3	0.1	0.2	0.2
	DICA14	*Dichelostemma capitatum*	33.3	0.1	0.2	0.2

California Annual Grassland Alliance

ASSOCIATIONS
Bromus diandrus-Mixed Herb
Bromus madritensis-Mixed Herb
Hemizonia fasciculata-Annual Herb

LOCAL VEGETATION DESCRIPTION
Stands of California Annual Grassland form an open to continuous herbaceous layer (15-95%, mean 60.3%) at 0-1m tall, where the dominant species may be native or non-native. Emergent shrubs occur infrequently (0.2-26% cover, mean 6.4%) at 0.5-5m tall, and may include a variety of different species (e.g., *Eriogonum fasciculatum, Lessingia filaginifolia, Rhus ovata,* and *Gutierrezia sarothrae*). Total vegetation cover is 18-94% (mean 63.1%).

In one stand of the ***Bromus diandrus*-Mixed Herb Association,** *Bromus diandrus* is the most abundant species and intermixes primarily with other non-native species, including *Hordeum marinum, Salsola tragus, Hirschfeldia incana,* and *Lactuca serriola*. Native forb *Eremocarpus setigerus* is present at low cover.

In one stand of the ***Bromus madritensis*-Mixed Herb Association,** *Bromus madritensis* and *Bromus tectorum* are the most abundant species and intermix primarily with other non-native species (e.g., *Schismus barbatus, Sonchus oleraceus, Hirschfeldia incana, Avena barbata*). Native species may be present (e.g., *Phacelia minor* and *Cryptantha intermedia*).

In the ***Hemizonia fasciculata*-Annual Grass-Herb Association**, *Hemizonia fasciculata* and *Hirschfeldia incana* are characteristically present at low to moderate cover. The most abundant species in four samples of this association include non-native species *Centaurea melitensis, Erodium cicutarium, Centaurea solstitialis,* and *Marrubium vulgare*. Native species such as *Lasthenia californica* and *Amsinckia menziesii* may be present at low cover.

Additional inventory and sampling of annual grassland and forb sites is needed to fully represent the native herbland biodiversity within the California Annual Grassland Alliance. For example, it is likely that alliances of *Bromus diandrus and Bromus madritensis* exist in the region, but were undersampled and placed in a broader category.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,420-2,840 ft., mean 2,142 ft.
Aspect: variable
Slope: flat to steep, range 0-40 degrees, mean 11.1 degrees
Topography: variable, bottom to upper slopes
Litter Cover: range 8-85%, mean 41.6%
Rock Cover: range 0-40%, mean 10.9%
Bare ground: range 5-85%, mean 40.4%
Parent Material: sedimentary, gabbro and diorite, alluvium, volcanic
Soil Texture: varies from medium sandy loam to clay

The California Annual Grassland Alliance was sampled across low to mid-elevations in the Santa Ana Mountains (M262Bf), Perris Valley and Hills (M262Bk), and San Jacinto Foothills - Cahuilla Mountains (M262Bl) Subsections.

Samples used to describe alliance: (n=8) WRIV0302, WRIV0570, WRIV0969, WRIV0977, WRIV0979, WRIV0982, WRIV0985, WRIV0993

RANK: G1 S1, G2 S2, G3 S3, G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: North Coast, Central Coast (including Point Reyes and Santa Clara and San Benito Counties), Central Valley, Low elevations of the Klamath Ranges, Cascade Range foothills, southern and central Sierra Nevada, South Coast (including Western Riverside and San Diego Counties), Transverse and Peninsular Ranges (including Ventura, Los Angeles, Western Riverside and San Diego Counties), Channel Islands, Mojave Desert and Colorado Deserts, Baja California

Bromus diandrus-Mixed Herb Association: South Coast and Peninsular Ranges (including Western Riverside and San Diego Counties), though full distribution is not known
Bromus madritensis-Mixed Herb Association: South Coast and Peninsular Ranges (including Western Riverside and San Diego Counties), though full distribution is not known
Hemizonia fasciculata-Annual Grass-Herb Association: South Coast and Peninsular Ranges (including Western Riverside County), though full distribution is not known

REFERENCES
Boyd et al. 1995, CDFG 2000, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San 2004, Evens and San In publication, Keeler-Wolf 1990, Keeley 1989, NatureServe 2003a, NatureServe 2003b, Potter 2003, Sawyer and Keeler-Wolf 1995, Shuford and Timossi 1989, Vogl 1976

California Annual Grassland Alliance

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ERFA2	*Eriogonum fasciculatum*	37.5	0.3	0.2	1
	RHOV	*Rhus ovata*	25	0.2	0.2	1
	GUSA2	*Gutierrezia sarothrae*	25	0.1	0.2	0.2
Herb	HIIN3	*Hirschfeldia incana*	75	10.1	0.2	65
	HEFA	*Hemizonia fasciculata*	62.5	12.9	1	60
	BRMA3	*Bromus madritensis*	50	2.2	0.2	15
	AVBA	*Avena barbata*	50	1.8	0.2	10
	CEME2	*Centaurea melitensis*	37.5	5.9	0.2	45
	LEFI11	*Lessingia filaginifolia*	37.5	0.2	0.2	1
	ERCI6	*Erodium cicutarium*	25	6.9	5	50
	ERSE3	*Eremocarpus setigerus*	25	1.5	2	10
	LACA7	*Lasthenia californica*	25	0.9	2	5
	SCBA	*Schismus barbatus*	25	0.4	1	2
	LASE	*Lactuca serriola*	25	0.3	0.2	2
	AMME	*Amsinckia menziesii*	25	0.2	0.2	1
	LOMU	*Lolium multiflorum*	25	0.2	0.2	1
	ASTRA	*Astragalus*	25	0.1	0.2	0.2

***Eleocharis macrostachya* Alliance (Pale Spikerush)**

ASSOCIATIONS
Eleocharis macrostachya-Eryngium aristulatum subsp. *parishii*

LOCAL VEGETATION DESCRIPTION
Stands of *Eleocharis macrostachya* form an intermittent to continuous herbaceous layer (45-96%, mean 72%) at 0-1m tall, where *Eleocharis macrostachya* dominates. Total vegetation cover is 45-96% (mean 72%).

In two stands of the ***Eleocharis macrostachya-Eryngium aristulatum* subsp. *parishii* Association**, *Downingia* sp. (e.g., *Downingia bella*) and *Eryngium aristulatum* subsp. *parishii* characteristically occur at low cover while *Eleocharis macrostachya* is dominant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,929-2,069 ft., mean 2,007 ft.
Aspect: flat
Slope: flat, 0 degrees, mean 0 degrees
Topography: flat, bottom to top slopes
Litter Cover: range 5-30%, mean 17.5%
Rock Cover: range 15-20%, mean 17.5%
Bare ground: range 40-75%, mean 57.5%
Parent Material: volcanic, Mesozoic granite, sedimentary
Soil Texture: moderately fine silty clay loam, fine silty clay

The *Eleocharis macrostachya* Alliance was sampled only within the Santa Ana Mountains (M262Bf) Subsection, including the Santa Rosa Plateau, at lower elevations. Stands were in depressions of vernal pools or ponds with standing water.

Samples used to describe alliance: (n=3) WRIV0983, WRIV0989, WRIV0996

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: Central Coast (including San Benito County), foothill to upper montane habitats in central to southern Sierra Nevada (including Tuolumne County), Northeastern California National Forests (including Modoc Plateau), Peninsular Ranges (including Western Riverside County: Santa Ana Mountains)

Eleocharis macrostachya-Eryngium aristulatum subsp. *parishii* Association: Peninsular Ranges (including Western Riverside County: Santa Ana Mountains – specifically the Santa Rosa Plateau)

REFERENCES
CNPS and CDFG 2005a, Evens et al. 2004, Potter 2003, Smith 1998

***Eleocharis macrostachya* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Herb	ELMA5	*Eleocharis macrostachya*	100	60	40	80
	ERARP2	*Eryngium aristulatum* subsp. *parishii*	66.7	2.3	2	5
	ORCUT	*Orcuttia*	33.3	4	12	12
	JUNCU	*Juncus*	33.3	3.3	10	10
	DOWNI	*Downingia*	33.3	1	3	3
	ANCA10	*Anemopsis californica*	33.3	0.7	2	2
	DOBE	*Downingia bella*	33.3	0.7	2	2
	LYHY2	*Lythrum hyssopifolia*	33.3	0.3	1	1
	RUCR	*Rumex crispus*	33.3	0.3	1	1
	CLPUQ	*Clarkia purpurea* subsp. *quadrivulnera*	33.3	0.1	0.2	0.2
	POMO5	*Polypogon monspeliensis*	33.3	0.1	0.2	0.2
	TYPHA	*Typha*	33.3	0.1	0.2	0.2

***Hemizonia pungens* subsp. *laevis* Unique Stands (Smooth Tarplant)**

ASSOCIATIONS
None

LOCAL VEGETATION DESCRIPTION
Stands of *Hemizonia pungens* subsp. *laevis* form an intermittent herbaceous layer (45-48%, mean 46.5%) at 0-0.5m tall, where *Hemizonia pungens* subsp. *laevis* dominates. The shrub layer is open (0.2%, mean 0.2%) at 0-1m tall. Total vegetation cover is 45-48% (mean 46.5%).

Atriplex coronata var. *notatior,* a CNPS List 1B species (CNPS 2005), was found in 1 of 2 surveys of *Hemizonia pungens* subsp. *laevis* Unique Stands. See Appendix 3 for more information on this plant.

Hemizonia pungens subsp. *laevis,* a CNPS List 1B species (CNPS 2005), was found in 2 of 2 surveys of *Hemizonia pungens* subsp. *laevis* Unique Stands. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,402-1,519 ft., mean 1,461 ft.
Aspect: flat and SE
Slope: flat to gentle, range 0-2 degrees, mean 1 degrees
Topography: flat, bottom slopes
Litter Cover: range 0-7%, mean 3.5%
Rock Cover: range 1-20%, mean 10.5%
Bare ground: range 80-90%, mean 85%
Parent Material: sandy or silty alluvium
Soil Texture: medium to very fine sandy loam, moderately fine sandy clay loam

Both *Hemizonia pungens* subsp. *laevis* stands were sampled in the Perris Valley and Hills (M262Bk) Subsection on barely sloping, alkaline flats, in/near the San Jacinto Wildlife Area.

Samples used to describe alliance: (n=2) WRIV0837, WRIV0974

RANK: G2 S2?

GLOBAL DISTRIBUTION
Alliance: South Coast (Western Riverside County: Perris Valley and Hills Subsection), though full distribution is not known

REFERENCES
CNPS 2005

***Hemizonia pungens* subsp. *laevis* Unique Stands**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	SUMO	*Suaeda moquinii*	50	0.5	1	1
Herb	HEPUL	*Hemizonia pungens* subsp. *laevis*	100	19.5	17	22
	ERCI6	*Erodium cicutarium*	100	7	4	10
	HOMU	*Hordeum murinum*	100	6	2	10
	HIIN3	*Hirschfeldia incana*	100	0.6	0.2	1
	LACA7	*Lasthenia californica*	50	8.5	17	17
	BRMA3	*Bromus madritensis*	50	2.5	5	5
	AGROS2	*Agrostis*	50	1.5	3	3
	ERSE3	*Eremocarpus setigerus*	50	1.5	3	3
	CRYPT	*Cryptantha*	50	1	2	2
	SCBA	*Schismus barbatus*	50	1	2	2
	ATCON	*Atriplex coronata* var. *notatior*	50	0.5	1	1
	ATAR2	*Atriplex argentea*	50	0.1	0.2	0.2
	BRHO2	*Bromus hordeaceus*	50	0.1	0.2	0.2
	DISP	*Distichlis spicata*	50	0.1	0.2	0.2
	SATR12	*Salsola tragus*	50	0.1	0.2	0.2
	STEPH	*Stephanomeria*	50	0.1	0.2	0.2

***Hordeum depressum* Alliance (Low Barley)**

ASSOCIATIONS
Hordeum depressum-Hemizonia fasciculata-Atriplex coronata var. *notatior*

LOCAL VEGETATION DESCRIPTION
Stands of *Hordeum depressum* form an open to intermittent herbaceous layer (24-65%, mean 43%) at 0-0.5m tall, where *Hordeum depressum* dominates or co-dominates. The shrub layer is open (6%, mean 6%) at 0-0.5m tall. Total vegetation cover is 28-40% (mean 34%).

In the ***Hordeum depressum-Hemizonia fasciculata- Atriplex coronata* var. *notatior* Association,** all three species are consistently present at low cover. Other species that are often present at sparse cover include natives *Atriplex coronata* var. *notatior* and *Malvella leprosa,* and non-natives *Hordeum murinum*, *Mesembryanthemum nodiflorum*, and *Phalaris paradoxa* (see species table).

Atriplex coronata var. *notatior,* a CNPS List 1B species (CNPS 2005), was found in 2 of 2 surveys of the *Hordeum depressum* Alliance. See Appendix 3 for more information on this plant.

Hordeum intercedens, a CNPS list 3 species (CNPS 2005), may have been identified as *Hordeum depressum* in these two surveys. During the spring of 2005, *Hordeum intercedens* was dominant and more abundant than *Hordeum depressum* in the region surrounding this sampling location (Anderson, Bramlet, and Roberts, personal communications). Further study across multiple years is necessary to fully elucidate this alliance and the differential patterning between the two species. See Appendix 3 for more information on the listing status of *Hordeum intercedens*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,491-1,499 ft., mean 1,495 ft.
Aspect: flat
Slope: flat to gentle, range 0-1 degrees, mean 0.5 degrees
Topography: flat, bottom slopes
Litter Cover: range 7-60%, mean 33.5%
Rock Cover: range 0-0.2%, mean 0.1%
Bare ground: range 35-90%, mean 62.5%
Parent Material: silty alluvium
Soil Texture: fine silty clay

The *Hordeum depressum* Alliance was sampled only in the Perris Valley and Hills (M262Bk) Subsection in seasonally wet, clay-rich vernal pools and vernal alkali plains.

Samples used to describe alliance: (n=2) WRIV0811, WRIV0829

RANK: G2 S2?

GLOBAL DISTRIBUTION
Alliance: South Coast (Western Riverside County: Perris Valley and Hills Subsection in clay rich vernal pools and vernal alkali plains), though full distribution is not known

Hordeum depressum-Hemizonia fasciculata-Atriplex coronata var. *notatior* Association: same as alliance

REFERENCES
Anderson, Bramlet, and Roberts, personal communications, CNPS 2005

***Hordeum depressum* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	SUMO	*Suaeda moquinii*	33.3	2.3	7	7
Herb	HODE2	*Hordeum depressum*	100	18.7	6	30
	HEFA	*Hemizonia fasciculata*	100	12.4	0.2	30
	HOMU	*Hordeum murinum*	100	2	1	4
	ATCON	*Atriplex coronata* var. *notatior*	100	1.1	0.2	3
	MENO2	*Mesembryanthemum nodiflorum*	66.7	3.3	4	6
	PHPA5	*Phalaris paradoxa*	66.7	1.4	0.2	4
	MALE3	*Malvella leprosa*	66.7	0.1	0.2	0.2
	PLLE	*Plagiobothrys leptocladus*	33.3	7	21	21
	PSBR	*Psilocarphus brevissimus* var. *brevissimus*	33.3	6.7	20	20
	NAFO	*Navarretia fossalis*	33.3	2.7	8	8
	ATAR2	*Atriplex argentea*	33.3	1.7	5	5
	BRDI3	*Bromus diandrus*	33.3	0.3	1	1
	BRMA3	*Bromus madritensis*	33.3	0.3	1	1
	HOMA2	*Hordeum marinum*	33.3	0.3	1	1
	CRTR5	*Cressa truxillensis*	33.3	0.1	0.2	0.2
	ERCI6	*Erodium cicutarium*	33.3	0.1	0.2	0.2
	LELA3	*Lepidium latipes*	33.3	0.1	0.2	0.2
	MYMI2	*Myosurus minimus*	33.3	0.1	0.2	0.2

***Kochia scoparia* Alliance (Kochia)**

ASSOCIATIONS
Kochia scoparia-Bassia hyssopifolia

LOCAL VEGETATION DESCRIPTION
Stands of *Kochia scoparia* form an intermittent to consistent herbaceous layer (55-95%, mean 75%) at 0.5-2m tall, where *Kochia scoparia* dominates or co-dominates. The shrub layer is open (0.2-1%, mean 0.6%) at 1-5m tall. Total vegetation cover is 55-96% (mean 75.5%).

In the ***Kochia scoparia-Bassia hyssopifolia* Association,** *Kochia scoparia* and *Bassia hyssopifolia* are characteristically present, and either species may be dominant or co-dominant. *Tamarix* sp., and *Suaeda moquinii* may be present at trace cover in the shrub overstory. A variety of native and non-native species occupy the herb layer (see species table), with *Salsola tragus* and *Lactuca serriola* frequently present.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,451-1,554 ft., mean 1,503 ft.
Aspect: flat
Slope: flat, 0 degrees, mean 0 degrees
Topography: flat, bottom slopes
Litter Cover: range 10-15%, mean 12.5%
Rock Cover: range 0%, mean 0%
Bare ground: range 70-80%, mean 75%
Parent Material: silty alluvium
Soil Texture: moderately fine clay loam, moderately fine silty clay loam

The *Kochia scoparia* Alliance was sampled in the Perris Valley and Hills (M262Bk) Subsection on upland alkaline flats between Perris Reservoir and Gilman Springs Road. The region appears to be historically modified, possibly with previous farming.

Samples used to describe alliance: (n=2) WRIV0971, WRIV0972

RANK: none, invasive

GLOBAL DISTRIBUTION
Alliance: South Coast (Western Riverside County: Perris Valley and Hills Subsection), though full distribution is not known
Kochia scoparia-Bassia hyssopifolia Association: same as alliance

REFERENCES
Bossard 2000

***Kochia scoparia* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	TAMAR2	*Tamarix*	100	0.2	0.2	0.2
	SUMO	*Suaeda moquinii*	50	1	2	2
Herb	KOSC	*Kochia scoparia*	100	31.5	25	38
	BAHY	*Bassia hyssopifolia*	100	21	2	40
	LASE	*Lactuca serriola*	100	0.2	0.2	0.2
	SATR12	*Salsola tragus*	100	0.2	0.2	0.2
	SISYM	*Sisymbrium*	50	4	8	8
	MALE3	*Malvella leprosa*	50	0.5	1	1
	RUCR	*Rumex crispus*	50	0.5	1	1
	BEVU2	*Beta vulgaris*	50	0.1	0.2	0.2
	BRDI3	*Bromus diandrus*	50	0.1	0.2	0.2
	BRMA3	*Bromus madritensis*	50	0.1	0.2	0.2
	HECU3	*Heliotropium curassavicum*	50	0.1	0.2	0.2
	HOMU	*Hordeum murinum*	50	0.1	0.2	0.2
	PHALA2	*Phalaris*	50	0.1	0.2	0.2
	SEVE2	*Sesuvium verrucosum*	50	0.1	0.2	0.2
	SOOL	*Sonchus oleraceus*	50	0.1	0.2	0.2

***Lasthenia californica* Alliance (California Goldfields)**

ASSOCIATIONS
Lasthenia californica-Atriplex coronata var. *notatior*

LOCAL VEGETATION DESCRIPTION
Stands of *Lasthenia californica* form an intermittent herbaceous layer (34-48%, mean 38%) at 0-0.5m tall, where *Lasthenia californica* generally dominates. The shrub layer is open (<2-10%, mean 3.8) at 0-1m tall. Total vegetation cover is 34-48% (mean 40%).

In the ***Lasthenia californica-Atriplex coronata* var. *notatior* Association,** *Suaeda moquinii* and *Frankenia salina* may be present in the shrub layer at sparse cover. In the herb layer, *Lasthenia californica* and *Atriplex coronata* var. *notatior* are characteristically present, and *L. californica* can be seasonally dominant. Other herb species that are frequently present include native *Salicornia subterminalis* and *Bromus madritensis* (see species table).

Atriplex coronata var. *notatior*, a CNPS List 1B species (CNPS 2005), was found in 3 of 4 surveys of the *Lasthenia californica* Alliance. See Appendix 3 for more information on this plant.

Hemizonia pungens subsp. *laevis*, a CNPS List 1B species (CNPS 2005), was found in 1 of 4 surveys of the *Lasthenia californica* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,401-1,472 ft., mean 1,439 ft.
Aspect: flat, NE, and SE
Slope: gentle, range 1-5 degrees, mean 2 degrees
Topography: flat, bottom to lower slopes
Litter Cover: range 20-43%, mean 27.5%
Rock Cover: range 0.2-12%, mean 4.4%
Bare ground: range 25-75%, mean 53.3%
Parent Material: more often silty alluvium, less often gabbro and diorite
Soil Texture: fine silty clay, medium to very fine sandy loam

The *Lasthenia californica* Alliance was sampled in the Perris Valley and Hills (M262Bk) Subsection It commonly occurred on barely sloping, alkaline flats and scalds in the region, near the San Jacinto Wildlife Area.

Samples used to describe alliance: (n=4) WRIV0639, WRIV0838, WRIV0839, WRIV0976

RANK: G2 S2, G4 S4

GLOBAL DISTRIBUTION
Alliance: South Coast (Western Riverside County: Perris Valley and Hills Subsection), though full distribution is not known

Lasthenia californica-Atriplex coronata var. *notatior* Association: same as alliance

REFERENCES
CNPS 2005, Ferren et al. 1995

***Lasthenia californica* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	SUMO	*Suaeda moquinii*	75	1	0.2	3
	FRSA	*Frankenia salina*	75	0.6	0.2	2
	ARCA11	*Artemisia californica*	25	0.1	0.2	0.2
	GUCA	*Gutierrezia californica*	25	0.1	0.2	0.2
Herb	LACA7	*Lasthenia californica*	100	13.8	2	28
	BRMA3	*Bromus madritensis*	100	2.3	1	5
	ATCON	*Atriplex coronata* var. *notatior*	75	1.3	0.2	3
	SASU2	*Salicornia subterminalis*	75	0.6	0.2	2
	HOMU	*Hordeum murinum*	50	6.3	5	20
	HODE2	*Hordeum depressum*	50	5.3	9	12
	ATAR2	*Atriplex argentea*	50	4	8	8
	MENO2	*Mesembryanthemum nodiflorum*	50	0.8	1	2
	AVBA	*Avena barbata*	50	0.3	0.2	1
	ERODI	*Erodium*	25	2.5	10	10
	LELA3	*Lepidium latipes*	25	1.3	5	5
	HEPUL	*Hemizonia pungens* subsp. *laevis*	25	1	4	4
	ERCI6	*Erodium cicutarium*	25	0.8	3	3
	HOMA2	*Hordeum marinum*	25	0.8	3	3
	LENI	*Lepidium nitidum*	25	0.8	3	3
	AMME	*Amsinckia menziesii*	25	0.5	2	2
	COTUL	*Cotula*	25	0.3	1	1
	ESCA2	*Eschscholzia californica*	25	0.3	1	1
	GIAN	*Gilia angelensis*	25	0.3	1	1
	PHALA2	*Phalaris*	25	0.3	1	1
	DICA14	*Dichelostemma capitatum*	25	0.1	0.2	0.2
	LAGL4	*Lasthenia glabrata*	25	0.1	0.2	0.2
	SATR12	*Salsola tragus*	25	0.1	0.2	0.2
	SISYM	*Sisymbrium*	25	0.1	0.2	0.2
	URLI5	*Uropappus lindleyi*	25	0.1	0.2	0.2
Cryptogam	CRYPTO	Cryptogamic crust	25	5	20	20

***Lepidium latifolium* Alliance (Perennial Pepperweed)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
One stand of *Lepidium latifolium* Forbland forms a continuous herbaceous layer (98%) at 0.5-1m tall, where *Lepidium latifolium* dominates. The shrub layer is open (2%) at 1-2m tall, including species such as *Baccharis salicifolia* and *Sambucus mexicana*. Total vegetation cover is 100%.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 569 ft
Aspect: flat
Slope: flat, 0 degrees
Topography: flat, bottom slope
Litter Cover: 89%
Rock Cover: 1%
Bare Ground: 10%
Parent Material: silty alluvium
Soil Texture: moderately fine sandy clay loam

The *Lepidium latifolium* Alliance was sampled in the Fontana Plain - Calimesa Terraces (M262Bj) Subsection particularly within the Santa Ana River corridor.

Samples used to describe alliance: (n=1) WRIV0626

RANK: none, invasive

GLOBAL DISTRIBUTION
Alliance: Central Valley (including Solano County), South Coast (including Western Riverside County: Fontana Plain – Calimesa Terraces Subsection), though full distribution is not known

REFERENCES
Bossard et al. 2000, CDFG 2000

***Lepidium latifolium* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	SAME5	*Sambucus mexicana*	100	2	2	2
	BASA4	*Baccharis salicifolia*	100	1	1	1
Herb	LELA2	*Lepidium latifolium*	100	95	95	95
	COMA2	*Conium maculatum*	100	2	2	2
	ARDO4	*Arundo donax*	100	1	1	1
	AMPS	*Ambrosia psilostachya*	100	0.2	0.2	0.2
	HIIN3	*Hirschfeldia incana*	100	0.2	0.2	0.2
	MAPA5	*Malva parviflora*	100	0.2	0.2	0.2
	SATR12	*Salsola tragus*	100	0.2	0.2	0.2

***Muhlenbergia rigens* Alliance (Deergrass)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Muhlenbergia rigens* form an open to continuous herbaceous layer (23-92%, mean 57.5%) at 0-1m tall, where *Muhlenbergia rigens* dominates or co-dominates. The shrub layer is open (10%, mean 10%) at 0-2m tall. Total vegetation cover is 34-92% (mean 63%).

Stands of this alliance may have *Muhlenbergia rigens* as the dominant grass, or may include other graminoids such as *Elymus glaucus* and *Juncus* spp. An open shrub layer may include *Eriogonum fasciculatum* or *Eriogonum wrightii*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3,861-4,909 ft., mean 4,385 ft.
Aspect: flat or with mild SW exposure
Slope: gentle, range 1-2 degrees, mean 1.5 degrees
Topography: flat, bottom to lower slopes
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: sedimentary, alluvium
Soil Texture: moderately coarse sandy loam, medium loam

The *Muhlenbergia rigens* Alliance was sampled in the eastern portion of the study area in the San Jacinto Foothills - Cahuilla Mountains (M262Bl) and San Jacinto Mountains (M262Bm) Subsections on lower slope terraces.

Samples used to describe alliance: (n=2) WRIV0164, WRIV0715

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: Peninsular Ranges (Western Riverside County: San Jacinto Foothills - Cahuilla Mountains and San Jacinto Mountains Subsections), though full distribution is not known

REFERENCES
No reference citations

***Muhlenbergia rigens* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Understory	QUPA10-m	*Quercus palmeri*	50	1.5	3	3
Shrub	ERWR	*Eriogonum wrightii*	50	3	6	6
	ERFA2	*Eriogonum fasciculatum*	50	0.5	1	1
	ARPU5	*Arctostaphylos pungens*	50	0.1	0.2	0.2
	ARTR2	*Artemisia tridentata*	50	0.1	0.2	0.2
Herb	JUME4	*Juncus mexicanus*	50	20	40	40
	DESO2	*Descurainia sophia*	50	12.5	25	25
	MURI2	*Muhlenbergia rigens*	50	10	20	20
	ELGL	*Elymus glaucus*	50	9	18	18
	MUHLE	*Muhlenbergia*	50	8	16	16
	BRTE	*Bromus tectorum*	50	2.5	5	5
	ELYMU	*Elymus*	50	1	2	2
	LEFI11	*Lessingia filaginifolia*	50	0.5	1	1
	ERIOG	*Eriogonum*	50	0.1	0.2	0.2

***Nassella pulchra* Alliance (Purple Needlegrass)**

ASSOCIATIONS
Nassella pulchra-Erodium spp.-*Avena barbata*

LOCAL VEGETATION DESCRIPTION
Stands of *Nassella pulchra* form an open to continuous herbaceous layer (30-85%, mean 66.6%) at 0-1m tall, where *Nassella pulchra* generally dominates or co-dominates. The shrub layer is open (1-3%, mean 1.5) at 0.5-2m tall. Total vegetation cover is 32-85% (mean 67.4%).

In the ***Nassella pulchra-Erodium* spp.-*Avena barbata* Association**, the native bunchgrass *Nassella pulchra* is characteristically present with non-native species of *Erodium* and *Avena* at low cover. Some other common species that intermix in the herb layer include natives *Holocarpha virgata*, *Eremocarpus setigerus*, and *Viola pedunculata* and non-native *Hirschfeldia incana* (see species table). *Opuntia phaeacantha*, *Eriogonum fasciculatum*, and *Lupinus excubitus* occur occasionally in the shrub layer at trace cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,825-1,998 ft., mean 1,898 ft.
Aspect: more often variable, less often flat
Slope: gentle, range 1-3 degrees, mean 2.4 degrees
Topography: more often undulating, less often flat, bottom to top slopes
Litter Cover: range 10-75%, mean 38%
Rock Cover: range 1-20, 11.8%
Bare ground: range 5-40%, mean 23%
Parent Material: volcanic, sedimentary, Mesozoic granite
Soil Texture: moderately fine sandy clay loam, medium loam, clay

The *Nassella pulchra* Alliance was sampled only in the Santa Ana Mountains (M262Bf) Subsection.

Samples used to describe alliance: (n=5) WRIV0348, WRIV0352, WRIV0356, WRIV0994, WRIV0995

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: North and Central Coast (including Marin and Santa Clara Counties), Sacramento Valley, South Coast (including San Diego County), Sierra Nevada foothills (including Tuolumne County), low-elevation Transverse Ranges (including Santa Monica Mountains), montane Peninsular Ranges (including Western Riverside County), western Mojave Desert, Baja California

Nassella pulchra-Erodium spp.-*Avena barbata* Association: South Coast and Peninsular Ranges (including Western Riverside County: Santa Ana Mountains; San Diego County: coastal terraces and western foothills), though full distribution is not known

REFERENCES
Boyd et al. 1995, CNPS and CDFG 2005b, Evens et al. 2004, Evens and San In publication, Feidler and Leidy 1987, Keeley 1989, NatureServe et al. 2003a, Sawyer and Keeler-Wolf 1995

***Nassella pulchra* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ERFA2	*Eriogonum fasciculatum*	40	0.2	0.2	1
	LUEX	*Lupinus excubitus*	40	0.2	0.2	1
	OPPH	*Opuntia phaeacantha*	40	0.2	0.2	1
	MALA6	*Malosma laurina*	20	0.2	1	1
	QUBE5	*Quercus berberidifolia*	20	0.2	1	1
	ARCA11	*Artemisia californica*	20	0	0.2	0.2
	HASQ2	*Hazardia squarrosa*	20	0	0.2	0.2
	TODI	*Toxicodendron diversilobum*	20	0	0.2	0.2
Herb	NAPU4	*Nassella pulchra*	100	28	5	50
	ERODI	*Erodium*	100	24.2	4	50
	AVBA	*Avena barbata*	80	9.6	8	20
	HIIN3	*Hirschfeldia incana*	60	2.4	1	10
	HOVI	*Holocarpha virgata*	40	0.8	1	3
	ERSE3	*Eremocarpus setigerus*	40	0.6	1	2
	VIPE3	*Viola pedunculata*	40	0.4	1	1
	SIGA	*Silene gallica*	20	1.4	7	7
	HYGL2	*Hypochaeris glabra*	20	1	5	5
	LEFI11	*Lessingia filaginifolia*	20	0.8	4	4
Herb	BRHO2	*Bromus hordeaceus*	20	0.6	3	3
	LOMU	*Lolium multiflorum*	20	0.6	3	3
	FIGA	*Filago gallica*	20	0.4	2	2
	HEFA	*Hemizonia fasciculata*	20	0.4	2	2
	LASE	*Lactuca serriola*	20	0.2	1	1
	ALLIU	*Allium*	20	0	0.2	0.2
	AMPS	*Ambrosia psilostachya*	20	0	0.2	0.2
	CLPUQ	*Clarkia purpurea* subsp. *quadrivulnera*	20	0	0.2	0.2
	DOCL	*Dodecatheon clevelandii*	20	0	0.2	0.2
	ESCA2	*Eschscholzia californica*	20	0	0.2	0.2
	RUCR	*Rumex crispus*	20	0	0.2	0.2

***Plagiobothrys leptocladus* Unique Stands (Alkali Plagiobothrys)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
In one stand of *Plagiobothrys leptocladus,* the herbaceous layer is intermittent (65%) at 0-0.5m tall, and *Plagiobothrys leptocladus* co-dominates with *Psilocarphus brevissimus* var. *brevissimus* in the vernally wet swales and depressions. Total vegetation cover is 65% (mean 65%). Other species such as *Navarretia fossalis, Cressa truxillensis,* and *Lepidium latipes* occur in the vernally wet areas, while *Hemizonia fasciculata, Hordeum depressum, Hordeum murinum,* and *Hordeum marinum* intermix in the adjacent uplands.

Atriplex coronata var. *notatior,* a CNPS List 1B species (CNPS 2005), was found in this survey of the *Plagiobothrys leptocladus* Alliance. See Appendix 3 for more information on this plant.

Navarretia fossalis, a CNPS List 1B species (CNPS 2005), was found in this survey of the *Hordeum depressum* Alliance. See Appendix 3 for more information on this plant.

Hordeum intercedens, a CNPS list 3 species (CNPS 2005), may have been identified as *Hordeum depressum* in these two surveys. During the spring of 2005, *Hordeum intercedens* was dominant and more abundant than *Hordeum depressum* in the region surrounding this sampling location (Anderson, Bramlet, and Roberts, personal communications). Further study across multiple years is necessary to fully elucidate this alliance and the differential patterning between the two species. See Appendix 3 for more information on the listing status of *Hordeum intercedens*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1,497 ft.
Aspect: flat
Slope: gentle, 1 degree
Topography: undulating, bottom slopes
Litter Cover: 80%
Rock Cover: 0.2%
Bare ground: 18%
Parent Material: silty alluvium
Soil Texture: fine silty clay

The *Plagiobothrys leptocladus* stand was sampled only in the Perris Valley and Hills (M262Bk) Subsection in seasonally wet, clay-rich vernal pools and vernal alkali plains.

Samples used to describe alliance: (n=1) WRIV0810

RANK: G1 S1

GLOBAL DISTRIBUTION
Alliance: South Coast (Western Riverside County: Perris Valley and Hills Subsection in clay rich vernal pools and vernal alkali plains), though full distribution is not known

REFERENCES
Anderson, Bramlet, and Roberts, personal communications, CNPS 2005

***Plagiobothrys leptocladus* Unique Stands**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Herb	HEFA	*Hemizonia fasciculata*	100.0	30.0	30	30
	PLLE	*Plagiobothrys leptocladus*	100.0	21.0	21	21
	PSBR	*Psilocarphus brevissimus* var. *brevissimus*	100.0	20.0	20	20
	NAFO	*Navarretia fossalis*	100.0	8.0	8	8
	HODE2	*Hordeum depressum*	100.0	6.0	6	6
	HOMU	*Hordeum murinum*	100.0	4.0	4	4
	PHPA5	*Phalaris paradoxa*	100.0	4.0	4	4
	HOMA2	*Hordeum marinum*	100.0	1.0	1	1
	ATCON	*Atriplex coronata* var. *notatior*	100.0	0.2	0.2	0.2
	CRTR5	*Cressa truxillensis*	100.0	0.2	0.2	0.2
	LELA3	*Lepidium latipes*	100.0	0.2	0.2	0.2

***Salsola tragus* Alliance (Russian Thistle)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
One stand of *Salsola tragus* forms an open herbaceous layer (35%) at 0.5-1m tall, where *Salsola tragus* dominates. The shrub layer is open (0.2%) at 0-1m tall. Total vegetation cover is 35%.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 2,065 ft.
Aspect: flat with mild NE exposure
Slope: gentle, 2 degrees
Topography: flat, bottom to lower slope
Litter Cover: 10%,
Rock Cover: 5%
Bare ground: 75%
Parent Material: sedimentary
Soil Texture: moderately fine sandy clay loam

The *Salsola tragus* Alliance was sampled only in the Fontana Plain - Calimesa Terraces (M262Bj) Subsection on relatively flat, disturbed surface that had evidence of clearing and off-road vehicle use. This is a dangerously invasive, noxious weed that is highly competitive in semi-arid conditions, particularly in areas with disturbance.

Samples used to describe alliance: (n=1) WRIV0012

RANK: none, invasive

GLOBAL DISTRIBUTION
Alliance: Peninsular Ranges (Western Riverside County: Fontana Plain - Calimesa Terraces Subsection), though full distribution is not known

REFERENCES
UCB 2004

***Salsola tragus* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	BASA4	*Baccharis salicifolia*	100	0.2	0.2	0.2
	PRGLT	*Prosopis glandulosa* var. *torreyana*	100	0.2	0.2	0.2
Herb	SATR12	*Salsola tragus*	100	34	34	34
	AVBA	*Avena barbata*	100	2	2	2
	BRDI3	*Bromus diandrus*	100	2	2	2
	CUFO	*Cucurbita foetidissima*	100	1	1	1
	HECU3	*Heliotropium curassavicum*	100	1	1	1
	ATRIP-I	*Atriplex*	100	0.2	0.2	0.2
	CAPUP2	*Calystegia purpurata* subsp. *purpurata*	100	0.2	0.2	0.2
	CHAL11	*Chamaesyce albomarginata*	100	0.2	0.2	0.2
	DAWR2	*Datura wrightii*	100	0.2	0.2	0.2
	HIIN3	*Hirschfeldia incana*	100	0.2	0.2	0.2
	HOMU	*Hordeum murinum*	100	0.2	0.2	0.2
	LASE	*Lactuca serriola*	100	0.2	0.2	0.2
	LOPE	*Lolium perenne*	100	0.2	0.2	0.2
	MAVU	*Marrubium vulgare*	100	0.2	0.2	0.2

***Scirpus spp.* – *Typha spp.* Alliance (Bulrush - Cattail)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Scirpus* spp. – *Typha* spp. form an open to continuous herbaceous layer (24-80%, mean 56%) at 1-5m tall, where *Scirpus* spp. or *Typha* spp. usually co-dominate. The shrub layer is open (1-5%, mean 3) at 2-5m tall. Emergent trees occur occasionally (5% cover, mean 5%). Total vegetation cover is 25-85% (mean 57.5%).

In this alliance, wetland graminoid species such as *Scirpus americanus* or *Scirpus acutus* are usually co-dominant with species such as *Typha domingensis* or *Typha latifolia* ,respectively. *Populus fremontii*, *Salix gooddingii*, and *Salix lucida* may occur in the tree overstory at sparse cover.

One of the four stands sampled (WRAA.007) could be classified in the *Scirpus* (*californicus* and/or *acutus*)-*Typha* Association, which is described in the Suisun Marsh and San Dieguito Watershed in the *Scirpus californicus- Scirpus acutus* Alliance. The stand was placed into the *Scirpus* spp. – *Typha* spp. Alliance because it was the only representative of the *Scirpus* (*californicus* and/or *acutus*)-*Typha* Association.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 650-1,442 ft., mean 1,229 ft.
Aspect: flat or mild NE exposure
Slope: flat to gentle, range 0-1 degrees, mean 0.5 degrees
Topography: more often flat, less often concave, bottom slopes
Litter Cover: range 1-75%, mean 40.3%
Rock Cover: 0%, mean 0%
Bare ground: range 5-80%, mean 25%
Parent Material: sandy, silty, clayey alluvium
Soil Texture: medium silt loam, moderately fine silty clay loam, muck

The *Scirpus* spp.-*Typha* spp. Alliance was sampled in the Fontana Plain - Calimesa Terraces (M262Bj) and Perris Valley and Hills (M262Bk) Subsections.

Samples used to describe alliance: (n=4) WRAA.004, WRAA.007, WRIV0643, WRIV0975

RANK: G1 S1, G2 S2, G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: North Central Coast (including Marin County), Central Valley (including Sacramento Valley and Solano County), South Coast (including Western Riverside County). It is likely that this Alliance is widespread in California

REFERENCES
CDFG 2000, Evens and San In publication, Ferren 1989, NatureServe et al. 2003a

***Scirpus spp.-Typha spp.* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Tree Overstory	SAGO-t	*Salix gooddingii*	25	1.3	5	5
	SALU-t	*Salix lucida*	25	0.5	2	2
	POFR2-t	*Populus fremontii*	25	0.1	0.2	0.2
Shrub	FRSA	*Frankenia salina*	50	1.3	0.2	5
	SALA6-t	*Salix lasiolepis*	25	0.5	2	2
	BASA4	*Baccharis salicifolia*	25	0.3	1	1
	SUMO	*Suaeda moquinii*	25	0.3	1	1
	TAMAR2	*Tamarix*	25	0.1	0.2	0.2
	VIGI2	*Vitis girdiana*	25	0.1	0.2	0.2
Herb	TYLA	*Typha latifolia*	100	10.3	1	30
	RUCR	*Rumex crispus*	75	3.3	0.2	12
	TYDO	*Typha domingensis*	50	23.3	28	65
	SCAM2	*Scirpus americanus*	50	10.3	6	35
	SCRO	*Scirpus robustus*	50	4	1	15
	SCACO4	*Scirpus acutus* var. *occidentalis*	25	2.5	10	10
	DISP	*Distichlis spicata*	25	1.8	7	7
	ARDO4	*Arundo donax*	25	1.3	5	5
	JUTE2	*Juncus textilis*	25	0.8	3	3
	ATRIP-l	*Atriplex*	25	0.3	1	1
	LELA2	*Lepidium latifolium*	25	0.3	1	1
	POMO5	*Polypogon monspeliensis*	25	0.3	1	1
	RASA2	*Raphanus sativus*	25	0.3	1	1
	BAHY	*Bassia hyssopifolia*	25	0.1	0.2	0.2
	SCBA	*Schismus barbatus*	25	0.1	0.2	0.2
	SOOL	*Sonchus oleraceus*	25	0.1	0.2	0.2
	SPERG2	*Spergularia*	25	0.1	0.2	0.2
	URDI	*Urtica dioica*	25	0.1	0.2	0.2

***Sporobolus airoides* Alliance (Alkali Sacaton)**

ASSOCIATIONS

None, alliance only

LOCAL VEGETATION DESCRIPTION
One stand of *Sporobolus airoides* forms an open herbaceous layer (24%) at 0-0.5m tall, and a sparse shrub layer (0.2%) at 0.5-1m tall. Total vegetation cover is 24%.

In the one stand sampled, *Sporobolus airoides* is dominant and *Distichlis spicata* is sub-dominant in the herb layer. It is adjacent to a riparian corridor of *Quercus agrifolia* and *Salix laevigata*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 2,003 ft.
Aspect: slight NW exposure
Slope: gentle, 1 degree
Topography: flat, bottom slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: alluvium from parent material of Mesozoic granite
Soil Texture: medium to very fine sandy loam

The *Sporobolus airoides* Alliance was sampled only in the San Jacinto Foothills - Cahuilla Mountains (M262BI) Subsection on alluvial soil adjacent to a riparian corridor. The sample was located along Colt Road, east of De Portola Road.

Samples used to describe alliance: (n=1) WRIV0202

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: outer Central Coast, Delta, San Joaquin Valley, Southern California (including Western Riverside County: San Jacinto Foothills – Cahuilla Mountains Subsection), Eastside Sierra and valleys, Mojave Desert, Colorado and Mojave Deserts

REFERENCES
Sawyer and Keeler-Wolf 1995, Thomas et al. 2004

***Sporobolus airoides* Alliance**

Stratum	Code	Species Name	Con	Avg	Min	Max
Shrub	ISOCO	*Isocoma*	100	0.2	0.2	0.2
Herb	SPAI	*Sporobolus airoides*	100	20	20	20
	DISP	*Distichlis spicata*	100	10	10	10
	AMPS	*Ambrosia psilostachya*	100	3	3	3
	ANCA10	*Anemopsis californica*	100	0.2	0.2	0.2
	ATRIP-I	*Atriplex*	100	0.2	0.2	0.2
	HECU3	*Heliotropium curassavicum*	100	0.2	0.2	0.2
	SATR12	*Salsola tragus*	100	0.2	0.2	0.2
	URDI	*Urtica dioica*	100	0.2	0.2	0.2

Vernal Alkali Plain, Vernal Alkali Playa, and Vernal Pool Habitats

ASSOCIATIONS
None, habitat only

LOCAL VEGETATION DESCRIPTION
Existing literature describes these habitats as having an open to dense herbaceous layer.

Vernal Alkali Plains could include grassland associations dominated by *Hordeum depressum* or *Hordeum intercedens*. Associated species may include natives *Atriplex argentea* var. *mohavensis, Atriplex coronata* var. *notatior, Cressa truxillensis, Deschampsia danthonioides, Malvella leprosa,* and *Plagiobothrys leptocladus*, and non-natives *Hordeum marinum* subsp. *gussoneanum*, *Hordeum murinum*, *Mesembryanthemum nodiflorum*, *Phalaris lemmonii*, and *Phalaris paradoxa*.

Vernal Alkali Plains could also include forb associations dominated by *Lasthenia californica* or *Lasthenia glabrata* subsp. *coulter*. Associated species may include natives *Castilleja exserta, Deschampsia danthonioides, Distichlis spicata, Frankenia salina, Hordeum depressum, Layia platyglossa, Lepidium dictyotum* var. *acutidens, Lepidium latipes* var. *latipes, Malvella leprosa, Microseris douglasii* subsp. *douglasii, Myosurus minimus* subsp. *apus, Navarretia fossalis, Orcuttia californica*, *Plagiobothrys leptocladus, Psilocarphus brevissimus* var. *brevissimus* and *Salicornia subterminalis, Trifolium depauperatum* var. *amplectens,* and non-natives *Hordeum marinum*.

Vernal Alkali Playa could include forb associations dominated by *Plagiobothrys leptocladus* and *Psilocarphus brevissimus* var. *brevissimus*. Associated species may include natives *Atriplex coronata* var. *notatior, Cressa truxillensis, Hordeum depressum, Lepidium latipes, Myosurus minimus, Navarretia fossalis* and non-natives *Hordeum marinum, Hordeum murinum*, and *Phalaris* spp.

Vernal Pools such as in the Santa Rosa Plateau could include associations dominated by *Downingia bella, Downingia cuspidata, Eleocharis acicularis, Eleocharis macrostachya,* or *Eryngium aristulatum* var. *parishii*. Associated species may include natives *Callitriche heterophylla* var. *bolanderi, Isoetes howellii, Isoetes orcuttii, Juncus bufonius, Lilaea scilloides, Navarretia prostrata, Plagiobothrys bracteatus, Plagiobothrys stipitatus* var. *micranthus, Plagiobothrys undulatus, Ranunculus aquatilis,* and *Scribneria bolanderi*.

Other Vernal Pools found in the county (e.g., southwest of Hemet) could be dominated by *Juncus bufonius, Myosurus minimus, Navarretia fossalis, Orcuttia californica, Plagiobothrys leptocladus* or *Psilocarphus brevissimus* var. *brevissimus*. Associated species may include *Callitriche marginata, Crassula aquatica, Marsilea vestita, Pilularia americana,* and *Veronica peregrina*.

LOCAL ENVIRONMENTAL DESCRIPTION
Depending on yearly precipitation, species composition and abundance vary in these habitats. While these habitats share some qualities (like hydrology in wet years), and could be affected by the same changes in hydrology, the alkali plains appear to dry out faster than the vernal pools. A couple of descriptions in this report (e.g. *Eleocharis macrostachya, Hordeum depressum*, *Lasthenia californica,* and *Plagiobothrys leptocladus* alliances) represent some of these vernal habitats. However, more data need to be collected in higher rainfall years to adequately describe these vegetation types.

The drier Vernal Alkali Plains habitat had soils varying from fine sandy loam to silty clay. They occur in alkaline areas along the San Jacinto River, Salt Creek tributary drainage, Santa Rosa Plateau and probably other areas within the County. The Vernal Alkali Playa habitat is inundated with water for a longer period of time than the Alkali Plains with soils typically characterized as silty clay. They occur in the Salt Creek tributary drainage and playa areas along the San Jacinto River. The Vernal Pools are the wettest habitats, with deeper depressions and soils characterized as silty clay. They occur in the Gavilan Hills, Perris Basin area, and Santa Rosa Plateau.

Samples used to describe alliance: (n=0)

RANK: G2 S2, G3 S3 (depending on type)

GLOBAL DISTRIBUTION
Habitat: inner South Coast and Peninsular Ranges (including Western Riverside County: Santa Ana Mountains and Perris Valley and Hills Subsections)

REFERENCES
Anderson, Bramlet, and Sanders, personal communications, Bramlet 1994a, Bramlet 1994b, Ferren et al. 1995, Roberts et al. 2004,

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APPENDIX 1. Vegetation sampling protocols and field forms.

CALIFORNIA NATIVE PLANT SOCIETY –
VEGETATION RAPID ASSESSMENT PROTOCOL
CNPS VEGETATION COMMITTEE
(November 5, 2001, Revised July 23, 2002)

Introduction

The rapid assessment protocol is a reconnaissance-level method of vegetation and habitat sampling. It may be used to quickly assess and map the extent of all vegetation types in relatively large, ecologically defined regions. The California Native Plant Society (CNPS) has adopted this method to verify locations of known vegetation types, to gain information about new types, and to acquire general information about their composition, habitat, and site quality. Other agencies, such as California State Parks and the U.S. Forest Service, are also adopting this method for documenting vegetation patterns.

By using this method, biologists and resource managers can gain a broad ecological perspective, as the full range in ecological variation across broad landscapes can be reflected in the vegetation assessments. For example, changes in environmental elements (such as geology, aspect, topographic position) or physical processes (fire, flooding, erosion, and other natural or human-made disturbances) can influence the distribution of plants or patterning of vegetation, which are documented in the rapid assessments. In turn, these vegetation patterns can influence the distribution of animals across the landscape.

The quantitative vegetation data recorded in the rapid assessments can be described with standard classification techniques and descriptions, and they can be depicted in maps across any landscape. Additional information recorded in the assessments, such as disturbance history and anthropogenic impacts, can serve to define habitat quality and integrity for plant and animal distributions. Because this method provides an important means for representing the full array of biological diversity as well as habitat integrity in an area, it can also be an effective and efficient tool for conducting natural resource planning.

Purpose

The Vegetation Program has adopted the rapid assessment method to update the location, distribution, species composition, and disturbance information of vegetation types as identified in the first edition of *A Manual of California Vegetation* (MCV), a CNPS publication. The release of the MCV heralded a new statewide perspective on vegetation classification. The premise of the book – all vegetation can be quantified based on cover, constancy, and composition of plant species, yielding uniform defensible definitions of vegetation units – has proven to be very useful throughout California and the rest of the nation. The MCV has become the standard reference on California vegetation and has been adopted by many agencies such as California Department of Fish and Game, the National Park Service, and the U.S. Forest Service as the standard approach to classify vegetation statewide.

One of the most important purposes of rapid assessments is to verify the locations of each vegetation type because much about the geography of vegetation remains uncertain in this state. To obtain a more accurate understanding of the location and distribution of the vegetation types, nothing short of systematic inventory will suffice. Using the rapid assessment method, CNPS Chapters and other organizations can work together in selected ecological regions to gather vegetation data over a short time period in a broad area. This geographic inventory of vegetation types can greatly advance the current distribution understanding of vegetation.

In addition, California is working with a new vegetation classification, and its parameters are largely untested. The rapid assessment method will be used to gather additional information on species composition, distribution, disturbance effects, and environmental influences of vegetation. Thus, this method will provide modifications to the existing vegetation classifications and information on new types.

This protocol can also be used in tandem with other resource assessment protocols such as California Wildlife Habitat Relationships (CWHR) protocols to obtain detailed records on habitat quality and suitability for vertebrate animals in any terrestrial habitat. The CWHR protocols can also help test the relationships between the vegetation type and habitat of various animals and thereby refine the understanding and predictability of the distribution of animals. A portion of the CWHR protocols is incorporated into the rapid assessment method to obtain suitability information for vertebrate species.

While people can quickly obtain information on the variety of vegetation types using this method, some of the vegetation types recorded in the rapid assessment process may be poorly defined in the current classification system. These poorly understood or unknown types will be identified and located and then will be prioritized for more detailed assessment using the CNPS relevé protocol. Thus, the rapid assessment method will be used in conjunction with the relevé method to provide large quantities of valuable data on the distribution and the definition of vegetation. These data will be entered into existing databases for summarizing and archiving, and they will be used to modify and improve statewide vegetation classification and conservation information.

<u>Why do we need to know about the composition and distribution of vegetation?</u>

- to have a more accurate understanding of the commonness and rarity of different forms of vegetation throughout the state
- to link the distribution of various rare and threatened plant species with the vegetation units
- to provide a clearer picture of relationships between vegetation types
- to help prioritize community-based land conservation goals based on the local representation of unique types, high diversity areas, etc.
- to do the same for regional vegetation throughout the state and the nation.
- to broaden the vegetation knowledge base for California
- to motivate people to do more to help identify, protect, and conserve vegetation in their area
- to link vegetation types with habitat for animals

Selecting stands to sample:

To start the rapid assessment method, stands of vegetation needs to be defined.
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 alpine meadow or tundra types, and some may be several square kilometers in size, such as desert or forest types. A stand is defined by two 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, a 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.

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.

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

Depending on the project goals, you may want to select just one or a few representative stands of each homogeneous vegetation type for sampling (*e.g.* for developing a classification for a vegetation mapping project), or you may want to sample all of them (*e.g.* to define a rare vegetation type and/or compare site quality between the few remaining stands).

Definitions of fields in the protocol

LOCATIONAL/ENVIRONMENTAL DESCRIPTION

Polygon/Stand #: Number assigned either in the field or in the office prior to sampling. It is usually denoted with an abbreviation of the sampling location and then a sequential number of that locale (*e.g.* CRRA-001 for Coyote Ridge rapid assessment number 1).

Air photo #: The number given to the aerial photo in a vegetation-mapping project, for which photo interpreters have already done photo interpretation and delineations of polygons. If the sample site has not been photo-interpreted, leave blank.

Date: Date of the sampling.

Name(s) of surveyors: The full names of each person assisting should be provided for the first rapid assessment. In successive assessments, initials of each person assisting can be recorded. Please note: The person recording the data on the form should circle their name/initials.

GPS waypoint #: The waypoint number assigned by a Global Positioning System (GPS) unit when marking and storing a waypoint for the stand location. These waypoints can be downloaded from the GPS into a computer Geographic Information System to depict sample points accurately on a map.

GPS name: The name personally assigned to each GPS unit (especially useful if more than one GPS unit is used to mark waypoints for the project).

GPS datum: (NAD 27) The map datum that is chosen for GPS unit to document location coordinates. The default datum for CNPS projects is NAD 27. However, other agencies and organizations may prefer another datum. Please circle NAD27 or write in the appropriate datum.

Is 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, or circle "No" to denoted the waypoint was taken at a distance from the stand (such as with a binocular view of the stand).

If No cite distance (note ft/m), bearing and view from point to stand: An estimate of the number of feet or meters (please circle appropriate), the compass bearing from the waypoint of GPS to the stand, and the method of view used to verify the plot (*e.g*. binoculars, aerial photo).

Error: ± The accuracy of the GPS location, when taking the UTM field reading. Please denote feet (ft) or meters (m). It is typical for all commercial GPS units to be accurate to within 5 m (or 16 ft.) of the actual location, because the military's intentional imprecision (known as "selective availability") has been "turned off" as of July 2000. Please become familiar with your GPS unit's method of determining error. Some of the lower cost models do not have this ability. If using one of those, insert N/A in this field.

UTM field reading: Easting (UTME) and northing (UTMN) location coordinates using the Universal Transverse Mercator (UTM) grid. Record using a GPS unit or USGS topographic map.

UTM zone: Universal Transverse Mercator zone. Zone 10S for California west of the 120th longitude; zone 11S for California east of 120th longitude.

Elevation: Recorded from the GPS unit or USGS topographic map. Please denote feet (ft) or meters (m), and note if reading is from GPS unit or map. (Please note: Readings taken from a GPS unit can be hundreds of feet off.)

Photograph #'s: Note the roll number, frame number, direction, and the name of the person whose camera is being used. Take at least two photographs from different directions, and describe the location and view direction from compass bearings for each frame. Additional photographs of the stand may also be helpful. (Also, if using a digital camera or scanning the image into a computer, positions relative to the polygon/stand number can be recorded digitally.)

Topography: Check two of the provided features, characterizing both the local relief and the broad topographic position of the area. First assess the minor topographic features or the lay of the area (*e.g*. surface is flat, concave, etc.). Then assess the broad topographic feature or general position of the area (*e.g*. stand is at the bottom, lower (1/3 of slope), middle (1/3 of slope), upper (1/3 of slope), or top).

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

Soil: Record soil texture or series that is characteristic of the site (*e.g*. sand, silt, clay, coarse loamy sand, sandy clay loam, saline, et.). *See soil texture key and code list for types*.

% Large Rock (optional): Estimate the percent surface cover of large rocks (e.g. stones, boulders, bedrock) that are beyond 25 cm in size.

% Small Rock (optional): Estimate the percent surface cover of small rocks (e.g. gravel, cobbles) that are greater than 2 mm and less than 25 cm in size.

% Bare/Fines (optional): Estimate the percent surface cover of bare ground and fine sediment (e.g. dirt) that is 2 mm or less in size.

General slope exposure (circle one and enter actual º): Read degree aspect from a compass or clinometer (or estimate). Make sure to average the reading across entire stand. "Variable" may be selected if the same, homogenous stand of vegetation occurs across a varied range of slope exposures.

General slope steepness (circle one and enter actual º): Read degree slope from compass (or estimate), using degrees from true north (adjusting for declination). Average the reading over entire stand.

Upland or Wetland (circle one) Indicate if the stand is in an upland or a wetland; note that a site need not be officially delineated as a wetland to qualify as such in this context (*e.g*. seasonally wet meadow).

Site history, stand age, and comments: Briefly describe the stand age/seral stage, disturbance history, nature and extent of land use, and other site environmental and vegetation factors. 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.

Type / level of disturbance (use codes): List codes for potential or existing impacts on the stability of the plant community. Characterize each impact each as L (=Light), M (=Moderate), or H (=Heavy). *See code list for impacts*.

VEGETATION DESCRIPTION

Basic alliance and stand description

Field-assessed vegetation alliance name: Name of alliance (series) or habitat following the CNPS classification system (Sawyer and Keeler-Wolf 1995). Please use binomial nomenclature, *e.g. Quercus agrifolia* forest. An alliance is based on the dominant (or diagnostic) species of the stand, and is usually of the uppermost and/or dominant height stratum. A dominant species covers the greatest area (and a diagnostic is consistently found in some vegetation types but not others).

Please note: The field-assessed alliance name may not exist in present classification, in which you can provide a new alliance name in this field. If this is the case, also make sure to denote and explain this in the "Cannot identify alliance based on MCV classification" of the "**Problems with Interpretation**" section below.

Field-assessed association name (optional): Name of the species in the alliance and additional dominant/diagnostic species from any strata, as according to CNPS classification. 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 agrifolia*/*Toxicodendron diversilobum*). Species in the same stratum are separated with a dash (*e.g. Quercus agrifolia-Quercus kelloggii*).

Please note: The field-assessed association name may not exist in present classification, in which you can provide a new association name in this field.

Size of stand: Estimate the size of the entire stand in which the rapid assessment is taken. As a measure, one acre is about 0.4 hectares or about 4000 square meters.

Number of encounters of this alliance (tally/circle once): This estimate can be done for a landscape-level project of a general area, ecological subsection, watershed, etc., though it is not required. Make an estimate of the total number of times that this alliance was seen in the project survey and recorded on field forms.

Please note: This estimation should only be done once, at the end of a project survey, for every alliance identified in the field. Please provide the tally once for each alliance, and provide the estimate on the first rapid assessment field form that was filled out for each alliance.

Habitat classification per California Wildlife-Habitat Relationships (CWHR)
For CWHR, identify the size/height class of the stand using the following tree, shrub, and/or herbaceous categories. These categories are based on functional life forms.

Tree: Circle one of the tree size classes provided when the tree canopy closure exceeds 10 percent of the total cover (except in desert types), or if young tree density indicates imminent tree dominance. Size class is based on the average dbh (diameter of trunk at breast height). In choosing a size class, make sure to estimate the mean diameter of all trees over the entire stand.

Circle the size class 6 multi-layered tree if there is a size class 5 of trees over a distinct layer of size class either 3 or 4 (*i.e.* distinct height class separation between different tree species) and the total tree canopy exceeds 60%.

If tree, list 1-3 dominant overstory species: If tree canopy cover exceeds 10 percent (except in desert types), please list the dominant species that occur in the overstory canopy.

Shrub: Circle one of the shrub size classes provided when shrub canopy closure exceeds 10 percent (except in desert types). Size 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 provided when herbaceous cover exceeds 2 percent. This height class is based on the average plant height at maturity.

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.

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

Overall cover of vegetation
Provide an ocular estimate of cover for the following categories (based on functional life forms). Record a specific number for the total aerial cover or "bird's-eye view" looking from above for each category, estimating cover for the living plants only. Litter/duff should not be included in these estimates.

To come up with a specific number estimate for percent cover, first use to the following CWHR cover intervals as a reference aid to get a generalized cover estimate: <2%, 2-9%, 10-24%, 25-39%, 40-59%, 60-100%. While keeping these intervals in mind, you can then refine your estimate to a specific percentage for each category below.

%Overstory Conifer/Hardwood Tree cover: The total aerial cover (canopy closure) of all live tree species that are specifically in the overstory or are emerging, disregarding overlap of individual trees. Estimate conifer and hardwood covers separately. Please note: These cover values should not include the coverage of suppressed understory trees.

Shrub cover: The total aerial cover (canopy closure) of all live shrub species, disregarding overlap of individual shrubs.

Ground cover: The total aerial cover (canopy closure) of all herbaceous species, disregarding overlap of individual herbs.

Total Veg cover: The total aerial cover of all vegetation. This is an estimate of the absolute vegetation cover, disregarding overlap of the various tree, shrub, and/or herbaceous layers.

Modal height for conifer/hardwood tree, shrub, and herbaceous categories (*optional*)
If height values are important in your vegetation survey project, provide an ocular estimate of height for each category listed. Record an average height value, estimating the modal height for each group. Use the following height intervals and record a height class: 01=<1/2m, 02=1/2-1m, 03=1-2m, 04=2-5m, 05=5-10m, 06=10-15m, 07=15-20m, 08=20-35m, 09=35-50m, 10=>50m.

SPECIES LIST AND COVERAGE

Species (List up to 12 major species), Stratum, and Approximate % cover: (Jepson Manual nomenclature please)

List the species that are dominant or that are characteristically consistent throughout the stand.

When different layers of vegetation occur in the stand, 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. Provide a stratum code for each species listed, based on height, where T (=Tall) is >5 m in height, M (=Medium) is between 0.5 and 5 m in height, and L (=Low) is <0.5 m in height.

Also, provide a numerical ocular estimate of aerial coverage for each species. When estimating, it is often helpful to think of coverage in terms of the cover intervals from the CNPS relevé form at first (*e.g*. <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%). Keeping these classes in mind, then refine your estimate to a specific percentage (e.g., the cover of species "x" is somewhere between 25 and 50 percent, but I think it is actually around 30%). Please note: All estimates are to be reported as absolute cover (not relative cover), and all the species percent covers may total over 100% when added up because of overlap.

Major non-native species in stand (with % cover): All exotic species occurring in the stand should be listed in this space provided (or they can be recorded in the above Species list). Make sure to give each exotic species an absolute coverage estimate.

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

PROBLEMS WITH INTERPRETATION

Confidence in 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. 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.

Cannot identify alliance based on MCV classification? (Check if appropriate) and Explain: If the field-assessed alliance name is not defined by CNPS's present Manual of California Vegetation (MCV) classification, note this in the space and describe why. In some instances for specific projects, there may be the benefit of more detailed classifications than what

is presented in the first edition of the MCV. If this is the case, be sure to substitute the most appropriate and detailed classification.

Other identification problems (describe): Discuss any further problems with the identification of the assessment (*e.g.* stand is observed with an oblique view using binoculars, so the species list may be incomplete, or the cover percentages may be imperfect).

Polygon is more than one type (Yes, No) (Note: type with greatest coverage in polygon should be entered in above section). This is relevant to areas that have been delineated as polygons on aerial photographs for a vegetation-mapping project. In most cases the polygon delineated is intended to represent a single stand, however mapping conventions and the constraints and interpretability of remote images will alter the ability to map actual stands on the ground. "Yes" is noted when the polygon delineated contains the field-assessed alliance and other vegetation type(s), as based on species composition and structure. "No" is noted when the polygon is primarily representative of the field-assessed alliance.

Other types: If "Yes" above, then list the other subordinate vegetation alliances that are included within the polygon. List them in order of their amount of the polygon covered.

Has the vegetation changed since air photo taken? (Yes, No) If an aerial photograph is being used for reference, evaluate if the stand of the field-assessed alliance has changed as a result of disturbance or other historic change since the photograph was taken.

If Yes, how? What has changed (write N/A if so)**?** If the photographic signature of the vegetation has changed (*e.g.* in structure, density, or extent), please detail here.

Simplified Key to Soil Texture (Brewer and McCann, 1982)

Place about three teaspoons of soil in the palm of your hand. Take out any particles >2mm in size, and use the following key to figure out the soil texture (e.g. loamy sand). Then figure out the texture subclass by using the Code List attached (e.g. coarse loamy sand).

A1 Soil does not remain in a ball when squeezed.....sand

A2 Soil remains in a ball when squeezed..... B

B1 Add a small amount of water. Squeeze the ball between your thumb and forefinger, attempting to make a ribbon that you push up over your finger. Soil makes no ribbon.....loamy sand

B2 Soil makes a ribbon; may be very short.....C

C1 Ribbon extends less than 1 inch before breaking.....D

C2 Ribbon extends 1 inch or more before breaking.....E

D1 Add excess water to small amount of soil; soil feels very gritty or at least slightly gritty .....loam or sandy loam

D2 Soil feels smooth.....silt loam

E1 Soil makes a ribbon that breaks when 1–2 inches long; cracks if bent into a ring.....F

E2 Soil makes a ribbon 2+ inches long; does not crack when bent into a ring.....G

F1 Add excess water to small amount of soil; soil feels very gritty or at least slightly gritty.....sandy clay loam or clay loam

F2 Soil feels smooth.....silty clay loam or silt

G1 Add excess water to a small amount of soil; soil feels gritty or at least slightly gritty.....sandy clay or clay

G2 Soil feels smooth.....silty clay

CALIFORNIA NATIVE PLANT SOCIETY RELEVÉ FIELD FORM CODE LIST

(revised 7/8/02)

MACRO TOPOGRAPHY

00 Bench
01 Ridge top (interfluve)
02 Upper 1/3 of slope
03 Middle 1/3 of slope
04 Lower 1/3 of slope (lowslope)
05 Toeslope (alluvial fan/bajada)
06 Bottom/plain
07 Basin/wetland
08 Draw
09 Other
10 Terrace (former shoreline or floodplain)
11 Entire slope
12 Wash (channel bed)
13 Badland (complex of draws & interfluves)
14 Mesa/plateau
15 Dune/sandfield
16 Pediment
17 Backslope (cliff)

MICRO TOPOGRAPHY

01 Convex or rounded
02 Linear or even
03 Concave or depression
04 Undulating pattern
05 Hummock or Swale pattern
06 Mounded
07 Other

IMPACTS

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

PARENT MATERIAL

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

SOIL TEXTURE

COSA	Coarse sand
MESN	Medium sand
FISN	Fine sand
COLS	Coarse, loamy sand
MELS	Medium to very fine, loamy sand
MCSL	Moderately coarse, sandy loam
MESAL	Medium to very fine, sandy loam
MELO	Medium loam
MESIL	Medium silt loam
MESI	Medium silt
MFCL	Moderately fine clay loam
MFSA	Moderately fine sandy clay loam
MFSL	Moderately fine silty clay loam
FISA	Fine sandy clay
FISC	Fine silty clay
FICL	Fine clay
SAND	Sand (class unknown)
LOAM	Loam (class unknown)
CLAY	Clay (class unknown)
UNKN	Unknown

DOMINANT VEGETATION GROUP

Trees:

TBSE	Temperate broad-leaved seasonal evergreen forest
TNLE	Temperate or subpolar needle-leafed evergreen forest
CDF	Cold-deciduous forest
MNDF	Mixed needle-leafed evergreen-cold deciduous. forest
TBEW	Temperate broad-leaved evergreen woodland
TNEW	Temperate or subpolar needle-leaved evergreen woodland
EXEW	Extremely xeromorphic evergreen woodland
CDW	Cold-deciduous woodland
EXDW	Extremely xeromorphic deciduous woodland
MBED	Mixed broad-leaved evergreen-cold deciduous woodland
MNDW	Mixed needle-leafed evergreen-cold deciduous woodland

Shrubs:

TBES	Temperate broad-leaved evergreen shrubland
NLES	Needle-leafed evergreen shrubland
MIES	Microphyllus evergreen shrubland
EXDS	Extremely xeromorphic deciduous shrubland
CDS	Cold-deciduous shrubland
MEDS	Mixed evergreen-deciduous shrubland
XMED	Extremely xeromorphic mixed evergreen-deciduous shrubland

Dwarf Shrubland:

NMED	Needle-leafed or microphyllous evergreen dwarf shrubland
XEDS	Extremely xeromorphic evergreen dwarf shrubland
DDDS	Drought-deciduous dwarf shrubland
MEDD	Mixed evergreen cold-deciduous dwarf shrubland

Herbaceous:

TSPG	Temperate or subpolar grassland
TGST	Temperate or subpolar grassland with sparse tree
TGSS	Temperate or subpolar grassland with sparse shrub layer
TGSD	Temperate or subpolar grassland with sparse dwarf shrub layer
TFV	Temperate or subpolar forb vegetation
THRV	Temperate or subpolar hydromorphic rooted vegetation
TAGF	Temperate or subpolar annual grassland or forb vegetation

***Sparse Vegetation*:**

SVSD	Sparsely vegetated sand dunes
SVCS	Sparsely vegetated consolidated substrates

CALIFORNIA NATIVE PLANT SOCIETY - Vegetation Rapid Assessment Field Form

(Revised July 23, 2002)

For Office Use:	Final database #:	Final vegetation type name:	Alliance_____ Association_____

LOCATIONAL/ENVIRONMENTAL DESCRIPTION

Polygon/Stand #:	Air photo #:	Date:	Name(s) of surveyors:
_____	_____	_____	_____

GPS waypoint #: _____ GPS name: _____ GPS datum: (NAD 27) _____ Is GPS within stand? Yes / No

If No cite distance (note ft/m), bearing and view from point to stand center: _____ Error: ±_____ ft/m

UTM field reading: UTME ___ ___ ___ ___ ___ ___ UTMN ___ ___ ___ ___ ___ ___ ___ UTM zone: _____

Elevation: _____ ft/m Photograph #'s: _____

Topography: flat____ concave____ convex____ undulating____ | bottom____ lower____ mid____ upper____ top____

Geology: _____ Soil Texture: _____ % Large Rock_____ % Small Rock_____ % Bare/Fines_____

Slope exposure (circle one and/or enter actual º)**: NE_____ SE_____ SW_____ NW_____ Flat__ Variable__**

Slope steepness (circle one and enter actual º)**: 0º__ 1-5º _____ 5-25º_____ > 25º_____ Upland or Wetland** (circle one)

Site history, stand age, and comments: _____

_____

_____

Type / level of disturbance (use codes)**: _____**

VEGETATION DESCRIPTION

Field-assessed vegetation alliance name: _____

Field-assessed association name (optional)**: _____**

Size of stand: <1 acre___ 1-5 acres___ >5 acres___ Number of encounters of this alliance: 1-5, 5-25, 25-50, >50 (tally/circle once)

Tree: 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)

If Tree, list 1-3 dominant overstory spp.: _____

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

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

% Overstory Conifer/Hardwood Tree cover: _____/_____ Shrub cover: _____ Herbaceous cover: _____ Total Veg cover:_____

Modal Conifer/Hardwood height: _____/_____ Tall Shrub/Low Shrub height: _____/_____ Herbaceous height: _____

Species (List up to 12 major species), Stratum, and Approximate % cover: (Jepson Manual nomenclature please)

Strata categories: T=tall, M=medium, L=low; **% cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, >75%**

Strata	Species	% cover		Strata	Species	% cover

Major non-native species (with % cover): _____

Unusual species: _____

PROBLEMS WITH INTERPRETATION

Confidence in identification: (L, M, H) _____ Cannot identify alliance based on MCV classification? _____ (Check if appropriate) and Explain _____

Other identification problems (describe): _____

Polygon is more than one type: (Yes, No) _____ (Note: type with greatest coverage in polygon should be entered in above section)

Other types: _____ _____ _____

Has the vegetation changed since air photo taken? (Yes, No) _____ If Yes, how? What has changed (write N/A if so)? _____

_____

APPENDIX 2. List of scientific and common names for species occurring in vegetation surveys. Codes and common names follow the Plants Database (USDA 2003).

Code	Scientific Name	Common Name	Family	Native
ABCO	*Abies concolor*	white fir	Pinaceae	Yes
ABRON	*Abronia*	sand verbena	Nyctaginaceae	Yes
ABVIA	*Abronia villosa* var. *aurita*	chaparral sand-verbena	Nyctaginaceae	Yes
ACMA3	*Acer macrophyllum*	bigleaf maple	Aceraceae	Yes
ACNEC2	*Acer negundo* var. *californicum*	box elder	Aceraceae	Yes
ACMI2	*Achillea millefolium*	common yarrow	Asteraceae	Yes
ACCO21	*Achnatherum coronatum*	giant ricegrass	Poaceae	Yes
ACSP12	*Achnatherum speciosum*	desert needlegrass	Poaceae	Yes
ACMI3	*Acourtia microcephala*	sacapellote	Asteraceae	Yes
ADFA	*Adenostoma fasciculatum*	chamise	Rosaceae	Yes
ADSP	*Adenostoma sparsifolium*	red shank	Rosaceae	Yes
AECY	*Aegilops cylindrica*	jointed goatgrass	Poaceae	No
AETR	*Aegilops triuncialis*	barbed goatgrass	Poaceae	No
AGDE	*Agave deserti*	desert agave	Agavaceae	Yes
AGROS2	*Agrostis*	bentgrass	Poaceae	Unknown
AIAL	*Ailanthus altissima*	ailanthus	Simaroubaceae	No
ALLIU	*Allium*	wild onion	Liliaceae	Unknown
ALCA2	*Allium campanulatum*	dusky onion	Liliaceae	Yes
ALPE	*Allium peninsulare*	Mexicali onion	Liliaceae	Yes
ALGI	*Allophyllum gilioides*	dense false gilyflower	Polemoniaceae	Yes
ALRH2	*Alnus rhombifolia*	white alder	Betulaceae	Yes
AMBRO	*Ambrosia*	ragweed	Asteraceae	Yes
AMPS	*Ambrosia psilostachya*	western ragweed	Asteraceae	Yes
AMUT	*Amelanchier utahensis*	western serviceberry	Rosaceae	Yes
AMCA5	*Amorpha californica*	mock locust	Fabaceae	Yes
AMFR	*Amorpha fruticosa*	desert indigobush	Fabaceae	Yes
AMME	*Amsinckia menziesii*	Menzies' fiddleneck	Boraginaceae	Yes
ANCA10	*Anemopsis californica*	yerba mansa	Saururaceae	Yes
ANTO	*Angelica tomentosa*	woolly angelica	Apiaceae	Yes
ANAC	*Anisocoma acaulis*	scalebud	Asteraceae	Yes
ANCO2	*Anthemis cotula*	stinking chamomile	Asteraceae	No
ANCO4	*Antirrhinum coulterianum*	Coulter's snapdragon	Scrophulariaceae	Yes
ANKE2	*Antirrhinum kelloggii*	Kellog snapdragon	Scrophulariaceae	Yes
ANNU3	*Antirrhinum nuttallianum*	violet snapdragon	Scrophulariaceae	Yes
APAN	*Apiastrum angustifolium*	wild parsley	Apiaceae	Yes
AQFO	*Aquilegia formosa*	Sitka columbine	Ranunculaceae	Yes
ARABI2	*Arabis*	rockcress	Brassicaceae	Yes
ARCTO3	*Arctostaphylos*	manzanita	Ericaceae	Yes
ARPR	*Arctostaphylos* (*pringlei*)	Pringle manzanita	Ericaceae	Yes
ARGL3	*Arctostaphylos glandulosa*	Eastwood's manzanita	Ericaceae	Yes

Code	Scientific Name	Common Name	Family	Native
ARGL4	*Arctostaphylos glauca*	bigberry manzanita	Ericaceae	Yes
ARPA6	*Arctostaphylos patula*	greenleaf manzanita	Ericaceae	Yes
ARPU5	*Arctostaphylos pungens*	pointleaf manzanita	Ericaceae	Yes
ARRA7	*Arctostaphylos rainbowensis*	Rainbow manzanita	Ericaceae	Yes
ARIST	*Aristida*	three-awn	Poaceae	Yes
ARNIC	*Arnica*	arnica	Asteraceae	Yes
ARCA11	*Artemisia californica*	California sagebrush	Asteraceae	Yes
ARDO3	*Artemisia douglasiana*	Douglas' sagewort	Asteraceae	Yes
ARDR4	*Artemisia dracunculus*	herbaceous sagewort	Asteraceae	Yes
ARLU	*Artemisia ludoviciana*	mugwort	Asteraceae	Yes
ARTR2	*Artemisia tridentata*	big sagebrush	Asteraceae	Yes
ARDO4	*Arundo donax*	giant reed	Poaceae	No
ASCA3	*Asclepias californica*	California milkweed	Asclepiadaceae	Yes
ASTRA	*Astragalus*	locoweed	Fabaceae	Yes
ASDO	*Astragalus douglasii*	Jacumba milkvetch	Fabaceae	Yes
ASPO2	*Astragalus pomonensis*	Pomona milkvetch	Fabaceae	Yes
ATFI	*Athyrium filix-femina*	common ladyfern	Dryopteridaceae	Yes
ATRIP	*Atriplex*	saltbush	Chenopodiaceae	Unknown
ATAR2	*Atriplex argentea*	silver saltweed	Chenopodiaceae	Yes
ATCA2	*Atriplex canescens*	fourwing saltbush	Chenopodiaceae	Yes
ATCON	*Atriplex coronata* var. *notatior*	San Jacinto Valley crownscale	Chenopodiaceae	Yes
ATPO	*Atriplex polycarpa*	allscale saltbush	Chenopodiaceae	Yes
AVENA	*Avena*	oats	Poaceae	No
AVBA	*Avena barbata*	slender oat	Poaceae	No
AVFA	*Avena fatua*	wild oat	Poaceae	No
BACCH	*Baccharis*	baccharis	Asteraceae	Yes
BAEM	*Baccharis emoryi*	Emory's baccharis	Asteraceae	Yes
BAPI	*Baccharis pilularis*	dwarf chaparral broom	Asteraceae	Yes
BASA4	*Baccharis salicifolia*	mule's fat	Asteraceae	Yes
BASA2	*Baccharis sarothroides*	desertbroom baccharis	Asteraceae	Yes
BASE	*Baccharis sergiloides*	squaw waterweed baccharis	Asteraceae	Yes
BAHY	*Bassia hyssopifolia*	fivehook bassia	Chenopodiaceae	No
BEJU	*Bebbia juncea*	sweetbush	Asteraceae	Yes
BEAQ	*Berberis aquifolium*	hollyleaved barberry	Berberidaceae	Yes
BEVU2	*Beta vulgaris*	common beet	Chenopodiaceae	No
BLCR	*Bloomeria crocea*	common goldenstar	Liliaceae	Yes
BOBA3	*Bothriochloa barbinodis*	cane bluestem	Poaceae	Yes
BOIN3	*Bowlesia incana*	hoary bowlesia	Apiaceae	Yes
BRNI	*Brassica nigra*	black mustard	Brassicaceae	No
BRTO	*Brassica tournefortii*	Asian mustard	Brassicaceae	Yes
BRCA3	*Brickellia californica*	California brickellbush	Asteraceae	Yes
BRDE3	*Brickellia desertorum*	desert brickellbush	Asteraceae	Yes
BROMU	*Bromus*	brome	Poaceae	Unknown

Code	Scientific Name	Common Name	Family	Native
BRCA5	*Bromus carinatus*	California brome	Poaceae	Yes
BRDI3	*Bromus diandrus*	ripgut grass	Poaceae	No
BRHO2	*Bromus hordeaceus*	soft brome	Poaceae	No
BRMA3	*Bromus madritensis*	foxtail chess	Poaceae	No
BROR2	*Bromus orcuttianus*	Orcutt's brome	Poaceae	Yes
BRTE	*Bromus tectorum*	cheatgrass	Poaceae	No
CACI2	*Calandrinia ciliata*	red maids	Portulacaceae	Yes
CADE27	*Calocedrus decurrens*	incense cedar	Cupressaceae	Yes
CALOC	*Calochortus*	mariposa lily	Liliaceae	Yes
CAPA3	*Calochortus palmeri*	Palmer's mariposa lily	Liliaceae	Yes
CAPL2	*Calochortus plummerae*	Plummer's mariposa lily	Liliaceae	Yes
CAMO5	*Calyptridium monandrum*	common pussypaws	Portulacaceae	Yes
CALYS	*Calystegia*	morning-glory	Convolvulaceae	Yes
CAMA24	*Calystegia macrostegia*	island false bindweed	Convolvulaceae	Yes
CAPUP2	*Calystegia purpurata* subsp. *purpurata*	Pacific false bindweed	Convolvulaceae	Yes
CAMIS	*Camissonia*	suncup	Onagraceae	Yes
CAREX	*Carex*	carex	Cyperaceae	Unknown
CABA4	*Carex barbarae*	Santa Barbara sedge	Cyperaceae	Yes
CANE2	*Carex nebrascensis*	Nebraska sedge	Cyperaceae	Yes
CARO5	*Carex rossii*	Ross' sedge	Cyperaceae	Yes
CASP6	*Carex spissa*	San Diego sedge	Cyperaceae	Yes
CASTI2	*Castilleja*	Indian paintbrush	Scrophulariaceae	Yes
CAAND	*Castilleja angustifolia* var. *dubia*	wavyleaf Indian paintbrush	Scrophulariaceae	Yes
CAAP4	*Castilleja applegatei*	pine Indian paintbrush	Scrophulariaceae	Yes
CAEX14	*Castilleja exserta*	purple owl's-clover	Scrophulariaceae	Yes
CAFO2	*Castilleja foliolosa*	woolly Indian paintbrush	Scrophulariaceae	Yes
CAHE11	*Caulanthus heterophyllus*	San Diego wild cabbage	Brassicaceae	Yes
CASI5	*Caulanthus simulans*	Payson's jewel-flower	Brassicaceae	Yes
CEANO	*Ceanothus*	ceanothus	Rhamnaceae	Yes
CECO	*Ceanothus cordulatus*	whitethorn ceanothus	Rhamnaceae	Yes
CECR	*Ceanothus crassifolius*	hoaryleaf ceanothus	Rhamnaceae	Yes
CECU	*Ceanothus cuneatus*	buckbrush	Rhamnaceae	Yes
CEGR	*Ceanothus greggii*	desert ceanothus	Rhamnaceae	Yes
CEIN3	*Ceanothus integerrimus*	deerbrush	Rhamnaceae	Yes
CELE2	*Ceanothus leucodermis*	chaparral whitethorn	Rhamnaceae	Yes
CEOL	*Ceanothus oliganthus*	hairy ceanothus	Rhamnaceae	Yes
CETO	*Ceanothus tomentosus*	woolyleaf ceanothus	Rhamnaceae	Yes
CEME2	*Centaurea melitensis*	Maltese star-thistle	Asteraceae	No
CESO3	*Centaurea solstitialis*	yellow star-thistle	Asteraceae	No
CEBE3	*Cercocarpus betuloides*	birchleaf mountain-mahogany	Rosaceae	Yes
CHAEN	*Chaenactis*	pincushion	Asteraceae	Yes
CHAR	*Chaenactis artemisiifolia*	white pincushion	Asteraceae	Yes
CHGL	*Chaenactis glabriuscula*	yellow pincushion	Asteraceae	Yes

Code	Scientific Name	Common Name	Family	Native
CHAMA15	*Chamaesyce*	sandmat	Euphorbiaceae	Unknown
CHAL11	*Chamaesyce albomarginata*	whitemargin sandmat	Euphorbiaceae	Yes
CHMI7	*Chamaesyce micromera*	Sonoran sandmat	Euphorbiaceae	Yes
CHEIL	*Cheilanthes*	lipfern	Pteridaceae	Yes
CHNE2	*Cheilanthes newberryi*	Newberry's lipfern	Pteridaceae	Yes
CHENO	*Chenopodium*	goosefoot	Chenopodiaceae	Unknown
CHGLS2	*Chenopodium glaucum* subsp. *salinum*	Rocky Mountain goosefoot	Chenopodiaceae	No
CHLOR3	*Chlorogalum*	soapplant	Liliaceae	Yes
CHPO3	*Chlorogalum pomeridianum*	wavyleaf soap plant	Liliaceae	Yes
CHORI2	*Chorizanthe*	spineflower	Polygonaceae	Yes
CHFI2	*Chorizanthe fimbriata*	fringed spineflower	Polygonaceae	Yes
CHSE11	*Chrysolepis sempervirens*	bush chinquapin	Fagaceae	Yes
CIOC	*Cirsium occidentale*	cobwebby thistle	Asteraceae	Yes
CLARK	*Clarkia*	clarkia	Onagraceae	Yes
CLDU	*Clarkia dudleyana*	Dudley's clarkia	Onagraceae	Yes
CLPUQ	*Clarkia purpurea* subsp. *quadrivulnera*	winecup clarkia	Onagraceae	Yes
CLRH	*Clarkia rhomboidea*	diamond clarkia	Onagraceae	Yes
CLAYT	*Claytonia*	springbeauty	Portulacaceae	Yes
CLPA5	*Claytonia parviflora*	streambank springbeauty	Portulacaceae	Yes
CLPE	*Claytonia perfoliata*	miner's lettuce	Portulacaceae	Yes
CLEMA	*Clematis*	leather flower	Ranunculaceae	Yes
CLLA3	*Clematis* (*lasiantha*)	pipestem clematis	Ranunculaceae	Yes
CLLI2	*Clematis ligusticifolia*	western white clematis	Ranunculaceae	Yes
COLLI	*Collinsia*	blue eyed Mary	Scrophulariaceae	Yes
COCO	*Collinsia concolor*	Chinese houses	Scrophulariaceae	Yes
COHE	*Collinsia heterophylla*	purple Chinese houses	Scrophulariaceae	Yes
COMA2	*Conium maculatum*	poison hemlock	Apiaceae	No
CORDY	*Cordylanthus*	bird's-beak	Scrophulariaceae	Yes
COFI	*Cordylanthus filifolius*	stiffbranch bird's beak	Scrophulariaceae	Yes
COTUL	*Cotula*	waterbuttons	Asteraceae	No
CRCO34	*Crassula connata*	sand pygmyweed	Crassulaceae	Yes
CRTR5	*Cressa truxillensis*	spreading alkaliweed	Convolvulaceae	Yes
CRCA5	*Croton californicus*	California croton	Euphorbiaceae	Yes
CRYPT	*Cryptantha*	cryptantha	Boraginaceae	Yes
CRIN8	*Cryptantha intermedia*	Clearwater cryptantha	Boraginaceae	Yes
CRMI	*Cryptantha micrantha*	redroot cryptantha	Boraginaceae	Yes
CRMI3	*Cryptantha microstachys*	Tejon cryptantha	Boraginaceae	Yes
CRMU2	*Cryptantha muricata*	pointed cryptantha	Boraginaceae	Yes
CRYPTO	Cryptogamic crust	cryptogamic crust	Unknown	Yes
CUFO	*Cucurbita foetidissima*	Missouri gourd	Cucurbitaceae	Yes
CUPA	*Cucurbita palmata*	coyote gourd	Cucurbitaceae	Yes
CUFO2	*Cupressus forbesii*	tecate cypress	Cupressaceae	Yes

Code	Scientific Name	Common Name	Family	Native
CUSCU	*Cuscuta*	dodder	Cuscutaceae	Yes
CYDA	*Cynodon dactylon*	Bermudagrass	Poaceae	No
CYPER	*Cyperus*	nutsedge	Cyperaceae	Unknown
DAGL2	*Datisca glomerata*	Durango root	Datiscaceae	Yes
DATUR	*Datura*	jimsonweed	Solanaceae	Unknown
DAME2	*Datura meteloides*	sacred thorn-apple	Solanaceae	Yes
DAWR2	*Datura wrightii*	sacred thorn-apple	Solanaceae	Yes
DAPU3	*Daucus pusillus*	American wild carrot	Apiaceae	Yes
DELPH	*Delphinium*	larkspur	Ranunculaceae	Yes
DEPA2	*Delphinium parryi*	San Bernardino larkspur	Ranunculaceae	Yes
DERI	*Dendromecon rigida*	tree poppy	Papaveraceae	Yes
DESCU	*Descurainia*	tansymustard	Brassicaceae	Unknown
DEPI	*Descurainia pinnata*	western tansymustard	Brassicaceae	Yes
DESO2	*Descurainia sophia*	herb sophia	Brassicaceae	No
DICH	*Dicentra chrysantha*	golden eardrops	Fumariaceae	Yes
DICHE2	*Dichelostemma*	snakelily	Liliaceae	Yes
DICA14	*Dichelostemma capitatum*	bluedicks	Liliaceae	Yes
DISP	*Distichlis spicata*	saltgrass	Poaceae	Yes
DOCL	*Dodecatheon clevelandii*	padre's shootingstar	Primulaceae	Yes
DOWNI	*Downingia*	calicoflower	Campanulaceae	Yes
DOBE	*Downingia bella*	Hoover's calicoflower	Campanulaceae	Yes
DRAR3	*Dryopteris arguta*	coastal woodfern	Dryopteridaceae	Yes
DUDLE	*Dudleya*	dudleya	Crassulaceae	Yes
DUED	*Dudleya edulis*	fingertips	Crassulaceae	Yes
DULA	*Dudleya lanceolata*	lanceleaf liveforever	Crassulaceae	Yes
DUPU	*Dudleya pulverulenta*	chalk dudleya	Crassulaceae	Yes
DUSA	*Dudleya saxosa*	Panamint liveforever	Crassulaceae	Yes
ECEN	*Echinocereus engelmannii*	Engelmann's hedgehog cactus	Cactaceae	Yes
ECCR	*Echinochloa crus-galli*	barnyardgrass	Poaceae	No
ELMA5	*Eleocharis macrostachya*	pale spikerush	Cyperaceae	Yes
ELYMU	*Elymus*	wildrye	Poaceae	Unknown
ELEL5	*Elymus elymoides*	squirreltail	Poaceae	Yes
ELGL	*Elymus glaucus*	blue wildrye	Poaceae	Yes
ELMU3	*Elymus multisetus*	big squirreltail	Poaceae	Yes
EMPE	*Emmenanthe penduliflora*	whisperingbells	Hydrophyllaceae	Yes
ENAC	*Encelia actoni*	Acton's brittlebush	Asteraceae	Yes
ENCA	*Encelia californica*	California brittlebush	Asteraceae	Yes
ENFA	*Encelia farinosa*	goldenhills	Asteraceae	Yes
EPNE	*Ephedra nevadensis*	Nevada jointfir	Ephedraceae	Yes
EPILO	*Epilobium*	willowherb	Onagraceae	Yes
EPGI	*Epipactis gigantea*	stream orchid	Orchidaceae	Yes
EQUIS	*Equisetum*	horsetail	Equisetaceae	Yes
EQAR	*Equisetum arvense*	field horsetail	Equisetaceae	Yes
EQLA	*Equisetum laevigatum*	smooth horsetail	Equisetaceae	Yes
ERMU5	*Eragrostis multicaulis*	Indian lovegrass	Poaceae	Yes

Code	Scientific Name	Common Name	Family	Native
ERSE3	*Eremocarpus setigerus*	dove weed	Euphorbiaceae	Yes
ERIAS	*Eriastrum*	woollystar	Polemoniaceae	Yes
ERSA	*Eriastrum sapphirinum*	sapphire woollystar	Polemoniaceae	Yes
ERICA2	*Ericameria*	goldenbush	Asteraceae	Yes
ERBR13	*Ericameria brachylepis*	chaparral goldenbush	Asteraceae	Yes
ERCU7	*Ericameria cuneata*	cliff goldenbush	Asteraceae	Yes
ERER11	*Ericameria ericoides*	California goldenbush	Asteraceae	Yes
ERLI6	*Ericameria linearifolia*	narrowleaf goldenbush	Asteraceae	Yes
ERPA15	*Ericameria palmeri*	Palmer's goldenbush	Asteraceae	Yes
ERPAP	*Ericameria palmeri* var. *pachylepis*	Palmer's rabbitbrush	Asteraceae	Yes
ERPA24	*Ericameria parishii*	Parish's rabbitbrush	Asteraceae	Yes
ERPI7	*Ericameria pinifolia*	pinebush	Asteraceae	Yes
ERIGE2	*Erigeron*	fleabane	Asteraceae	Yes
ERFO2	*Erigeron foliosus*	leafy fleabane	Asteraceae	Yes
ERCR2	*Eriodictyon crassifolium*	yerba santa	Hydrophyllaceae	Yes
ERTRT4	*Eriodictyon trichocalyx* var. *trichocalyx*	hairy yerba santa	Hydrophyllaceae	Yes
ERIOG	*Eriogonum*	buckwheat	Polygonaceae	Yes
ERDA4	*Eriogonum davidsonii*	Davidson's buckwheat	Polygonaceae	Yes
EREL6	*Eriogonum elongatum*	longstem buckwheat	Polygonaceae	Yes
ERFA2	*Eriogonum fasciculatum*	Eastern Mojave buckwheat	Polygonaceae	Yes
ERGR5	*Eriogonum gracile*	slender woolly buckwheat	Polygonaceae	Yes
ERNU3	*Eriogonum nudum*	naked buckwheat	Polygonaceae	Yes
ERWR	*Eriogonum wrightii*	bastardsage	Polygonaceae	Yes
ERIOP2	*Eriophyllum*	woolly sunflower	Asteraceae	Yes
ERCO25	*Eriophyllum confertiflorum*	golden-yarrow	Asteraceae	Yes
ERWA7	*Eriophyllum wallacei*	woolly easterbonnets	Asteraceae	Yes
ERODI	*Erodium*	stork's bill	Geraniaceae	No
ERCI6	*Erodium cicutarium*	redstem stork's bill	Geraniaceae	No
ERARP2	*Eryngium aristulatum* subsp. *parishii*	Parish's eryngo	Apiaceae	Yes
ESCA2	*Eschscholzia californica*	California poppy	Papaveraceae	Yes
EUCAL	*Eucalyptus*	eucalyptus	Myrtaceae	No
EUCH	*Eucrypta chrysanthemifolia*	spotted hideseed	Hydrophyllaceae	Yes
EUOC8	*Euonymus occidentalis*	western burning bush	Celastraceae	Yes
FEAC	*Ferocactus acanthodes*	California barrel cactus	Cactaceae	Yes
FECY	*Ferocactus cylindraceus*	California barrel cactus	Cactaceae	Yes
FILAG	*Filago*	cottonrose	Asteraceae	Unknown
FICA2	*Filago californica*	California cottonrose	Asteraceae	Yes
FIGA	*Filago gallica*	narrowleaf cottonrose	Asteraceae	No
FOVU	*Foeniculum vulgare*	sweet fennel	Apiaceae	No
FOPU2	*Forestiera pubescens*	stretchberry	Oleaceae	Yes
FRVE	*Fragaria vesca*	woodland strawberry	Rosaceae	Yes
FRSA	*Frankenia salina*	alkali heath	Frankeniaceae	Yes

Code	Scientific Name	Common Name	Family	Native
FRAXI	*Fraxinus* (*uhdei*)	ash	Oleaceae	Unknown
FRDI2	*Fraxinus dipetala*	California ash	Oleaceae	Yes
FRVE2	*Fraxinus velutina*	velvet ash	Oleaceae	Yes
GALIU	*Galium*	bedstraw	Rubiaceae	Unknown
GAAN	*Galium andrewsii*	phloxleaf bedstraw	Rubiaceae	Yes
GAAN2	*Galium angustifolium*	narrowleaf bedstraw	Rubiaceae	Yes
GAAP2	*Galium aparine*	stickywilly	Rubiaceae	No
GARRY	*Garrya*	silktassel	Garryaceae	Yes
GAFL2	*Garrya flavescens*	ashy silktassel	Garryaceae	Yes
GAVE2	*Garrya veatchii*	canyon silktassel	Garryaceae	Yes
GAVE3	*Gastridium ventricosum*	nit grass	Poaceae	No
GADIP	*Gayophytum diffusum* subsp. *parviflorum*	spreading groundsmoke	Onagraceae	Yes
GILIA	*Gilia*	gilia	Polemoniaceae	Yes
GIAN	*Gilia angelensis*	chaparral gilia	Polemoniaceae	Yes
GICA5	*Gilia capitata*	bluehead gilia	Polemoniaceae	Yes
GILA2	*Gilia latifolia*	broadleaf gilia	Polemoniaceae	Yes
GIOC	*Gilia ochroleuca*	volcanic gilia	Polemoniaceae	Yes
GISP2	*Gilia splendens*	grand gilia	Polemoniaceae	Yes
GNAPH	*Gnaphalium*	cudweed	Asteraceae	Unknown
GNBI	*Gnaphalium bicolor*	twocolor cudweed	Asteraceae	Yes
GNCA	*Gnaphalium californicum*	ladies' tobacco	Asteraceae	Yes
GNCA2	*Gnaphalium canescens*	Wright's cudweed	Asteraceae	Yes
GNLU	*Gnaphalium luteoalbum*	Jersey cudweed	Asteraceae	No
GUCA	*Gutierrezia californica*	San Joaquin snakeweed	Asteraceae	Yes
GUSA2	*Gutierrezia sarothrae*	broom snakeweed	Asteraceae	Yes
HASQ2	*Hazardia squarrosa*	sawtooth goldenbush	Asteraceae	Yes
HECA	*Helianthella californica*	California helianthella	Asteraceae	Yes
HESC2	*Helianthemum scoparium*	Bisbee Peak rushrose	Cistaceae	Yes
HELIA3	*Helianthus*	sunflower	Asteraceae	Yes
HECU3	*Heliotropium curassavicum*	salt heliotrope	Boraginaceae	Yes
HEMIZ	*Hemizonia*	tarweed	Asteraceae	Yes
HEFA	*Hemizonia fasciculata*	clustered tarweed	Asteraceae	Yes
HEPUL	*Hemizonia pungens* subsp. *laevis*	smooth tarplant	Asteraceae	Yes
HEAR5	*Heteromeles arbutifolia*	toyon	Rosaceae	Yes
HEGR7	*Heterotheca grandiflora*	telegraphweed	Asteraceae	Yes
HIIN3	*Hirschfeldia incana*	shortpod mustard	Brassicaceae	No
HOVI	*Holocarpha virgata*	yellowflower tarweed	Asteraceae	Yes
HODI	*Holodiscus discolor*	oceanspray	Rosaceae	Yes
HODE2	*Hordeum depressum*	dwarf barley	Poaceae	Yes
HOMA2	*Hordeum marinum*	seaside barley	Poaceae	Yes
HOMU	*Hordeum murinum*	mouse barley	Poaceae	No
HUHE	*Hulsea heterochroma*	redray alpinegold	Asteraceae	Yes
HUVE	*Hulsea vestita*	pumice alpinegold	Asteraceae	Yes

HYGL2	*Hypochaeris glabra*	smooth catsear	Asteraceae	No
ISOCO	*Isocoma*	goldenbush	Asteraceae	Yes
ISME5	*Isocoma menziesii*	coast goldenbush	Asteraceae	Yes
ISAR	*Isomeris arborea*	bladderpod spiderflower	Capparaceae	Yes
JEPA	*Jepsonia parryi*	Parry's jepsonia	Saxifragaceae	Yes
JUGLA	*Juglans*	walnut	Juglandaceae	Unknown
JUNCU	*Juncus*	rush	Juncaceae	Yes
JUBA	*Juncus balticus*	Baltic rush	Juncaceae	Yes
JUEF	*Juncus effusus*	common rush	Juncaceae	Yes
JULO	*Juncus longistylis*	longstyle rush	Juncaceae	Yes
JUME4	*Juncus mexicanus*	Mexican rush	Juncaceae	Yes
JURU	*Juncus rugulosus*	wrinkled rush	Juncaceae	Yes
JUTE2	*Juncus textilis*	basket rush	Juncaceae	Yes
JUCA7	*Juniperus californica*	California juniper	Cupressaceae	Yes
KECKI	*Keckiella*	keckiella	Scrophulariaceae	Yes
KEAN	*Keckiella antirrhinoides*	snapdragon penstemon	Scrophulariaceae	Yes
KECO	*Keckiella cordifolia*	heartleaf keckiella	Scrophulariaceae	Yes
KETE	*Keckiella ternata*	scarlet keckiella	Scrophulariaceae	Yes
KOSC	*Kochia scoparia*	Mexican-fireweed	Chenopodiaceae	No
KOMA	*Koeleria macrantha*	junegrass	Poaceae	Yes
LASE	*Lactuca serriola*	prickly lettuce	Asteraceae	No
LAAU	*Lamarckia aurea*	goldentop grass	Poaceae	No
LASTH	*Lasthenia*	goldfields	Asteraceae	Yes
LACA7	*Lasthenia californica*	California goldfields	Asteraceae	Yes
LACO7	*Lasthenia coronaria*	royal goldfields	Asteraceae	Yes
LAGL4	*Lasthenia glabrata*	yellowray goldfields	Asteraceae	Yes
LAVE2	*Lathyrus vestitus*	Pacific pea	Fabaceae	Yes
LAYIA	*Layia*	tidytips	Asteraceae	Yes
LAGL5	*Layia glandulosa*	whitedaisy tidytips	Asteraceae	Yes
LAPL	*Layia platyglossa*	coastal tidytips	Asteraceae	Yes
LEMNA	*Lemna*	duckweed	Lemnaceae	Yes
LEPID	*Lepidium*	pepperweed	Brassicaceae	Unknown
LELA	*Lepidium lasiocarpum*	shaggyfruit pepperweed	Brassicaceae	Yes
LELA2	*Lepidium latifolium*	broadleaved pepperweed	Brassicaceae	No
LELA3	*Lepidium latipes*	San Diego pepperweed	Brassicaceae	Yes
LENI	*Lepidium nitidum*	shining pepperweed	Brassicaceae	Yes
LESQ	*Lepidospartum squamatum*	California broomsage	Asteraceae	Yes
LEFI11	*Lessingia filaginifolia*	common sandaster	Asteraceae	Yes
LEGL18	*Lessingia glandulifera*	valley lessingia	Asteraceae	Yes
LECO12	*Leymus condensatus*	giant wildrye	Poaceae	Yes
ELTR3	*Leymus triticoides*	creeping ryegrass	Poaceae	Yes
LICHEN	Lichen	lichen	Unknown	Unknown
LIAN	*Linanthus androsaceus*	false babystars	Polemoniaceae	Yes
LICI	*Linanthus ciliatus*	whiskerbrush	Polemoniaceae	Yes
LILE	*Linanthus lemmonii*	Lemmon's linanthus	Polemoniaceae	Yes
LITHO2	*Lithophragma*	woodland-star	Saxifragaceae	Yes

LIAF	*Lithophragma affine*	San Francisco woodland-star	Saxifragaceae	Yes
LIPA5	*Lithophragma parviflorum*	smallflower woodland-star	Saxifragaceae	Yes
LIVER	Liverwort	liverwort	Unknown	Yes
LOMU	*Lolium multiflorum*	Italian ryegrass	Poaceae	No
LOPE	*Lolium perenne*	perennial ryegrass	Poaceae	No
LOLU	*Lomatium lucidum*	shiny biscuitroot	Apiaceae	Yes
LONIC	*Lonicera*	honeysuckle	Caprifoliaceae	Yes
LOHI2	*Lonicera hispidula*	pink honeysuckle	Caprifoliaceae	Yes
LOSU2	*Lonicera subspicata*	southern honeysuckle	Caprifoliaceae	Yes
LOTUS	*Lotus*	trefoil	Fabaceae	Unknown
LOCO6	*Lotus corniculatus*	birdfoot deervetch	Fabaceae	No
LOGR3	*Lotus grandiflorus*	chaparral bird's-foot trefoil	Fabaceae	Yes
LOPU3	*Lotus purshianus*	American bird's-foot trefoil	Fabaceae	Yes
LOSC2	*Lotus scoparius*	common deerweed	Fabaceae	Yes
LOST4	*Lotus strigosus*	strigose bird's-foot trefoil	Fabaceae	Yes
LUPIN	*Lupinus*	lupine	Fabaceae	Yes
LUAL4	*Lupinus albifrons*	silver lupine	Fabaceae	Yes
LUBI	*Lupinus bicolor*	miniature lupine	Fabaceae	Yes
LUCO	*Lupinus concinnus*	scarlet lupine	Fabaceae	Yes
LUEX	*Lupinus excubitus*	grape soda lupine	Fabaceae	Yes
LUFO2	*Lupinus formosus*	summer lupine	Fabaceae	Yes
LUHI3	*Lupinus hirsutissimus*	stinging annual lupine	Fabaceae	Yes
LULA4	*Lupinus latifolius*	broadleaf lupine	Fabaceae	Yes
LUSP2	*Lupinus sparsiflorus*	Mojave lupine	Fabaceae	Yes
LUTR2	*Lupinus truncatus*	collared annual lupine	Fabaceae	Yes
LYAN	*Lycium andersonii*	water jacket	Solanaceae	Yes
LYHY2	*Lythrum hyssopifolia*	hyssop loosestrife	Lythraceae	No
MALAC2	*Malacothamnus*	bushmallow	Malvaceae	Yes
MADE	*Malacothamnus densiflorus*	yellowstem bushmallow	Malvaceae	Yes
MAFA	*Malacothamnus fasciculatus*	Mendocino bushmallow	Malvaceae	Yes
MALAC3	*Malacothrix*	desertdandelion	Asteraceae	Yes
MALA6	*Malosma laurina*	laurel sumac	Anacardiaceae	Yes
MAPA5	*Malva parviflora*	cheeseweed mallow	Malvaceae	No
MALE3	*Malvella leprosa*	alkali mallow	Malvaceae	Yes
MAMA8	*Marah macrocarpus*	Cucamonga manroot	Cucurbitaceae	Yes
MAVU	*Marrubium vulgare*	horehound	Lamiaceae	No
MEPO3	*Medicago polymorpha*	burclover	Fabaceae	No
MEIM	*Melica imperfecta*	small-flowered melic grass	Poaceae	Yes
MEAL2	*Melilotus albus*	yellow sweetclover	Fabaceae	No
MEIN2	*Melilotus indicus*	sourclover	Fabaceae	No
MEOF	*Melilotus officinalis*	yellow sweetclover	Fabaceae	No
MENTZ	*Mentzelia*	blazingstar	Loasaceae	Yes
MENO2	*Mesembryanthemum nodiflorum*	slenderleaf iceplant	Aizoaceae	No
MICA	*Micropus californicus*	slender cottonweed	Asteraceae	Yes

MICRO6	*Microseris*	silverpuffs	Asteraceae	Yes
MILI5	*Microseris lindleyi*	Lindley's silverpuffs	Asteraceae	Yes
MIMUL	*Mimulus*	monkeyflower	Scrophulariaceae	Yes
MIAU	*Mimulus aurantiacus*	yellow bush monkeyflower	Scrophulariaceae	Yes
MIBR4	*Mimulus brevipes*	widethroat yellow monkeyflower	Scrophulariaceae	Yes
MIDI	*Mimulus diffusus*	Palomar monkeyflower	Scrophulariaceae	Yes
MIFR2	*Mimulus fremontii*	Fremont's monkeyflower	Scrophulariaceae	Yes
MIGU	*Mimulus guttatus*	seep monkeyflower	Scrophulariaceae	Yes
MIBI8	*Mirabilis bigelovii*	wishbone-bush	Nyctaginaceae	Yes
MICA6	*Mirabilis californica*	California four o'clock	Nyctaginaceae	Yes
MONAR2	*Monardella*	monardella	Lamiaceae	Yes
MOAL	*Morus alba*	white mulberry	Moraceae	No
MOSS	Moss	moss	Unknown	Unknown
MUHLE	*Muhlenbergia*	muhly	Poaceae	Yes
MUAS	*Muhlenbergia asperifolia*	scratchgrass	Poaceae	Yes
MURI2	*Muhlenbergia rigens*	deergrass	Poaceae	Yes
MYMI2	*Myosurus minimus*	tiny mousetail	Ranunculaceae	Yes
NADE	*Nama demissum*	purplemat	Hydrophyllaceae	Yes
NACE	*Nassella cernua*	nodding needlegrass	Poaceae	Yes
NAPU4	*Nassella pulchra*	purple tussockgrass	Poaceae	Yes
NAVAR	*Navarretia*	pincushionplant	Polemoniaceae	Yes
NAFO	*Navarretia fossalis*	spreading navarretia	Polemoniaceae	Yes
NEME	*Nemophila menziesii*	baby blue eyes	Hydrophyllaceae	Yes
NIGL	*Nicotiana glauca*	tree tobacco	Solanaceae	No
NOLIN	*Nolina*	beargrass	Liliaceae	Yes
OECA8	*Oenothera californica*	California suncup	Onagraceae	Yes
OLEU	*Olea europaea*	olive	Oleaceae	No
OPUNT	*Opuntia*	pricklypear	Cactaceae	Unknown
OPUNT	*Opuntia* (*littoralis x phaeacantha*)	prickly-pear	Cactaceae	Yes
OPBA2	*Opuntia basilaris*	beavertail pricklypear	Cactaceae	Yes
OPER	*Opuntia erinacea*	grizzlybear pricklypear	Cactaceae	Yes
OPLI3	*Opuntia littoralis*	coastal pricklypear	Cactaceae	Yes
OPPA2	*Opuntia parryi*	brownspined pricklypear	Cactaceae	Yes
OPPH	*Opuntia phaeacantha*	tulip pricklypear	Cactaceae	Yes
OPRA	*Opuntia ramosissima*	branched pencil cholla	Cactaceae	Yes
OPVA	*Opuntia vaseyi*	Vasey's coastal pricklypear	Cactaceae	Yes
ORCUT	*Orcuttia*	Orcutt grass	Poaceae	Yes
OSBR	*Osmorhiza brachypoda*	California sweetcicely	Apiaceae	Yes
PACA2	*Paeonia californica*	California peony	Paeoniaceae	Yes
PAHE5	*Parietaria hespera*	rillita pellitory	Urticaceae	Yes
PAMI5	*Parkinsonia microphylla*	yellow paloverde	Fabaceae	No
PECTO	*Pectocarya*	combseed	Boraginaceae	Yes
PELI	*Pectocarya linearis*	sagebrush combseed	Boraginaceae	Yes
PESE2	*Pedicularis semibarbata*	pinewoods lousewort	Scrophulariaceae	Yes

Code	Scientific Name	Common Name	Family	Native
PAMI5	*Parkinsonia microphylla*	yellow paloverde	Fabaceae	No
PECTO	*Pectocarya*	combseed	Boraginaceae	Yes
PELI	*Pectocarya linearis*	sagebrush combseed	Boraginaceae	Yes
PESE2	*Pedicularis semibarbata*	pinewoods lousewort	Scrophulariaceae	Yes
PELLA	*Pellaea*	cliffbrake	Pteridaceae	Yes
PEAN2	*Pellaea andromedifolia*	coffee cliffbrake	Pteridaceae	Yes
PEMU	*Pellaea mucronata*	birdfoot cliffbrake	Pteridaceae	Yes
PESE3	*Pennisetum setaceum*	crimson fountaingrass	Poaceae	No
PENST	*Penstemon*	beardtongue	Scrophulariaceae	Yes
PECE2	*Penstemon centranthifolius*	scarlet bugler	Scrophulariaceae	Yes
PESP3	*Penstemon spectabilis*	showy penstemon	Scrophulariaceae	Yes
PETR7	*Pentagramma triangularis*	goldback fern	Pteridaceae	Yes
PHACE	*Phacelia*	phacelia	Hydrophyllaceae	Yes
PHBR	*Phacelia brachyloba*	shortlobe phacelia	Hydrophyllaceae	Yes
PHCI	*Phacelia cicutaria*	caterpillar phacelia	Hydrophyllaceae	Yes
PHDI	*Phacelia distans*	distant phacelia	Hydrophyllaceae	Yes
PHMI	*Phacelia minor*	wild canterbury bells	Hydrophyllaceae	Yes
PHPA3	*Phacelia parryi*	Parry's phacelia	Hydrophyllaceae	Yes
PHRA2	*Phacelia ramosissima*	branching phacelia	Hydrophyllaceae	Yes
PHALA2	*Phalaris*	canary grass	Poaceae	Unknown
PHPA5	*Phalaris paradoxa*	hood canarygrass	Poaceae	No
PHGR16	*Phlox gracilis*	slender phlox	Polemoniaceae	Yes
PHDA4	*Phoenix dactylifera*	date palm	Arecaceae	No
PHORA	*Phoradendron*	mistletoe	Viscaceae	Yes
PHVI9	*Phoradendron villosum*	Pacific mistletoe	Viscaceae	Yes
PIAT	*Pinus attenuata*	knobcone pine	Pinaceae	Yes
PICOM	*Pinus contorta* var. *murrayana*	Murray lodgepole pine	Pinaceae	Yes
PICO3	*Pinus coulteri*	Coulter pine	Pinaceae	Yes
PIFL2	*Pinus flexilis*	limber pine	Pinaceae	Yes
PIJE	*Pinus jeffreyi*	Jeffrey pine	Pinaceae	Yes
PILA	*Pinus lambertiana*	sugar pine	Pinaceae	Yes
PIPO	*Pinus ponderosa*	ponderosa pine	Pinaceae	Yes
PIQU	*Pinus quadrifolia*	Parry pinyon	Pinaceae	Yes
PLAGI	*Plagiobothrys*	popcornflower	Boraginaceae	Yes
PLCO13	*Plagiobothrys collinus*	Cooper's popcornflower	Boraginaceae	Yes
PLLE	*Plagiobothrys leptocladus*	alkali plagiobothrys	Boraginaceae	Yes
PLANT	*Plantago*	plantain	Plantaginaceae	Unknown
PLER3	*Plantago erecta*	dotseed plantain	Plantaginaceae	Yes
PLLA	*Plantago lanceolata*	narrowleaf plantain	Plantaginaceae	No
PLRA	*Platanus racemosa*	California sycamore	Platanaceae	Yes
PLCA5	*Platystemon californicus*	creamcups	Papaveraceae	Yes
PLSE	*Pluchea sericea*	arrow weed	Asteraceae	Yes
POPR	*Poa pratensis*	Kentucky bluegrass	Poaceae	No
POSE	*Poa secunda*	perennial bluegrass	Poaceae	Yes

Code	Scientific Name	Common Name	Family	Native
POLEM	*Polemonium*	Jacob's-ladder	Polemoniaceae	Yes
POLYG4	*Polygonum*	knotweed	Polygonaceae	Unknown
POHY2	*Polygonum hydropiperoides*	swamp smartweed	Polygonaceae	Yes
POLYP2	*Polypogon*	rabbitsfoot grass	Poaceae	Unknown
POMO5	*Polypogon monspeliensis*	annual beard grass	Poaceae	No
POLYS	*Polystichum*	hollyfern	Dryopteridaceae	Yes
POBA2	*Populus balsamifera*	balsam poplar	Salicaceae	Yes
POFR2	*Populus fremontii*	Fremont cottonwood	Salicaceae	Yes
POGR5	*Porophyllum gracile*	slender poreleaf	Asteraceae	Yes
POGL9	*Potentilla glandulosa*	sticky cinquefoil	Rosaceae	Yes
PRGLT	*Prosopis glandulosa* var. *torreyana*	western honey mesquite	Fabaceae	Yes
PRIL	*Prunus ilicifolia*	hollyleaf cherry	Rosaceae	Yes
PSMA	*Pseudotsuga macrocarpa*	bigcone Douglas-fir	Pinaceae	Yes
PSMA	*Pseudotsuga macrocarpa*	bigcone Douglas-fir	Pinaceae	Yes
PSILO	*Psilocarphus*	woollyheads	Asteraceae	Yes
PSBR	*Psilocarphus brevissimus* var. *brevissimus*	woolly marbles	Asteraceae	Yes
PSTE	*Psilocarphus tenellus*	slender woollyheads	Asteraceae	Yes
PTAQP2	*Pteridium aquilinum* var. *pubescens*	hairy brackenfern	Dennstaedtiaceae	Yes
PTDR	*Pterostegia drymarioides*	woodland pterostegia	Polygonaceae	Yes
QUERC	*Quercus*	oak	Fagaceae	Unknown
QUGR4	*Quercus*	oak hybrid	Fagaceae	Yes
QUAG	*Quercus agrifolia*	California live oak	Fagaceae	Yes
QUBE5	*Quercus berberidifolia*	scrub oak	Fagaceae	Yes
QUCH	*Quercus chrysolepis*	canyon live oak	Fagaceae	Yes
QUCO7	*Quercus cornelius-mulleri*	Muller oak	Fagaceae	Yes
QUEN	*Quercus engelmannii*	Engelmann oak	Fagaceae	Yes
QUKE	*Quercus kelloggii*	California black oak	Fagaceae	Yes
QUPA10	*Quercus palmeri*	Palmer’s oak	Fagaceae	Yes
QUWI2	*Quercus wislizeni*	interior live oak	Fagaceae	Yes
RACA	*Rafinesquia californica*	California plumseed	Asteraceae	Yes
RASA2	*Raphanus sativus*	cultivated radish	Brassicaceae	No
RHAMN	*Rhamnus*	buckthorn	Rhamnaceae	Yes
RHCA	*Rhamnus californica*	California buckthorn	Rhamnaceae	Yes
RHCR	*Rhamnus crocea*	redberry buckthorn	Rhamnaceae	Yes
RHIL	*Rhamnus ilicifolia*	hollyleaf redberry	Rhamnaceae	Yes
RHTO6	*Rhamnus tomentella*	chaparral coffeeberry	Rhamnaceae	Yes
RHOC	*Rhododendron occidentale*	western azalea	Ericaceae	Yes
RHOV	*Rhus ovata*	sugar sumac	Anacardiaceae	Yes
RHTR	*Rhus trilobata*	skunkbush sumac	Anacardiaceae	Yes
RIBES	*Ribes*	currant	Grossulariaceae	Yes
RIAM	*Ribes amarum*	bitter gooseberry	Grossulariaceae	Yes
RIIN	*Ribes indecorum*	whiteflower currant	Grossulariaceae	Yes

Code	Scientific Name	Common Name	Family	Native
RIMA	*Ribes malvaceum*	chaparral currant	Grossulariaceae	Yes
RINE	*Ribes nevadense*	Sierra currant	Grossulariaceae	Yes
RIQU	*Ribes quercetorum*	rock gooseberry	Grossulariaceae	Yes
RIROR	*Ribes roezlii* var. *roezlii*	Sierra gooseberry	Grossulariaceae	Yes
RISP	*Ribes speciosum*	fuchsiaflower gooseberry	Grossulariaceae	Yes
RICO3	*Ricinus communis*	castorbean	Euphorbiaceae	No
ROBIN	*Robinia*	locust	Fabaceae	No
ROCO	*Romneya coulteri*	Coulter's Matilija poppy	Papaveraceae	No
RONA2	*Rorippa nasturtium-aquaticum*	watercress	Brassicaceae	No
ROPA2	*Rorippa palustris*	bog yellowcress	Brassicaceae	Yes
ROCA2	*Rosa californica*	California wildrose	Rosaceae	Yes
RUBUS	*Rubus*	blackberry	Rosaceae	Unknown
RUUR	*Rubus ursinus*	California blackberry	Rosaceae	Yes
RUMEX	*Rumex*	dock	Polygonaceae	No
RUCR	*Rumex crispus*	curly dock	Polygonaceae	No
SASU2	*Salicornia subterminalis*	Parish's glasswort	Chenopodiaceae	Yes
SALIX	*Salix*	willow	Salicaceae	Yes
SAEX	*Salix exigua*	narrowleaf willow	Salicaceae	Yes
SAGO	*Salix gooddingii*	Goodding's willow	Salicaceae	Yes
SALA3	*Salix laevigata*	red willow	Salicaceae	Yes
SALA6	*Salix lasiolepis*	arroyo willow	Salicaceae	Yes
SALU	*Salix lucida*	shining willow	Salicaceae	Yes
SASC	*Salix scouleriana*	Scouler's willow	Salicaceae	Yes
SATR12	*Salsola tragus*	prickly Russian thistle	Chenopodiaceae	No
SALVI	*Salvia*	sage	Lamiaceae	Unknown
SAAP2	*Salvia apiana*	white sage	Lamiaceae	Yes
SACA8	*Salvia carduacea*	thistle sage	Lamiaceae	Yes
SACL	*Salvia clevelandii*	fragrant sage	Lamiaceae	Yes
SACO6	*Salvia columbariae*	chia	Lamiaceae	Yes
SAME3	*Salvia mellifera*	black sage	Lamiaceae	Yes
SAME5	*Sambucus mexicana*	Mexican elderberry	Caprifoliaceae	Yes
SANIC	*Sanicula*	sanicle	Apiaceae	Yes
SACYH	*Sarcostemma cynanchoides* var. *hartwegii*	Hartweg's twinevine	Asclepiadaceae	Yes
SAHI2	*Sarcostemma hirtellum*	hairy milkweed	Asclepiadaceae	Yes
SCMO	*Schinus molle*	Peruvian pepper tree	Anacardiaceae	No
SCBA	*Schismus barbatus*	common Mediterranean grass	Poaceae	No
SCIRP	*Scirpus*	bulrush	Cyperaceae	Yes
SCACO4	*Scirpus acutus* var. *occidentalis*	hardstem bulrush	Cyperaceae	Yes
SCAM2	*Scirpus americanus*	chairmaker's bulrush	Cyperaceae	Yes
SCCA	*Scirpus californicus*	California bulrush	Cyperaceae	Yes
SCMI2	*Scirpus microcarpus*	panicled bulrush	Cyperaceae	Yes
SCRO	*Scirpus robustus*	sturdy bulrush	Cyperaceae	Yes
SCTA80	*Scirpus tabernaemontani*	softstem bulrush	Cyperaceae	Yes

Code	Scientific Name	Common Name	Family	Native
SCCA2	*Scrophularia californica*	California figwort	Scrophulariaceae	Yes
SELAG	*Selaginella*	spikemoss	Selaginellaceae	Yes
SEBI	*Selaginella bigelovii*	bushy spikemoss	Selaginellaceae	Yes
SENEC	*Senecio*	ragwort	Asteraceae	Unknown
SEFL3	*Senecio flaccidus*	threadleaf ragwort	Asteraceae	Yes
SETR	*Senecio triangularis*	arrowleaf ragwort	Asteraceae	Yes
SEVU	*Senecio vulgaris*	old-man-in-the-Spring	Asteraceae	No
SEVE2	*Sesuvium verrucosum*	verrucose seapurslane	Aizoaceae	Yes
SIMA2	*Sidalcea malviflora*	dwarf checkerbloom	Malvaceae	Yes
SIGA	*Silene gallica*	common catchfly	Caryophyllaceae	No
SIMA3	*Silybum marianum*	blessed milkthistle	Asteraceae	No
SICH	*Simmondsia chinensis*	jojoba	Simmondsiaceae	Yes
SISYM	*Sisymbrium*	hedgemustard	Brassicaceae	No
SIBE	*Sisyrinchium bellum*	western blue-eyed grass	Iridaceae	Yes
SOXA	*Solanum xanti*	chaparral nightshade	Solanaceae	Yes
SOCA5	*Solidago californica*	California goldenrod	Asteraceae	Yes
SONCH	*Sonchus*	sowthistle	Asteraceae	No
SOOL	*Sonchus oleraceus*	common sowthistle	Asteraceae	No
SPERG	*Spergula*	spurry	Caryophyllaceae	No
SPERG2	*Spergularia*	sandspurry	Caryophyllaceae	Unknown
SPHAE	*Sphaeralcea*	globemallow	Malvaceae	Yes
SPAM2	*Sphaeralcea ambigua*	desert globemallow	Malvaceae	Yes
SPAI	*Sporobolus airoides*	alkali sacaton	Poaceae	Yes
STAJR	*Stachys ajugoides* var. *rigida*	rough hedgenettle	Lamiaceae	Yes
STAL	*Stachys albens*	whitestem hedgenettle	Lamiaceae	Yes
SNAG	*Standing snag*	standing snag	Unknown	Unknown
STEPH	*Stephanomeria*	wirelettuce	Asteraceae	Yes
STLI3	*Stillingia linearifolia*	queen's-root	Euphorbiaceae	Yes
STGN	*Stylocline gnaphaloides*	mountain neststraw	Asteraceae	Yes
STHE3	*Stylomecon heterophylla*	windpoppy	Papaveraceae	Yes
SUMO	*Suaeda moquinii*	Mojave seablite	Chenopodiaceae	Yes
SYMO	*Symphoricarpos mollis*	creeping snowberry	Caprifoliaceae	Yes
TAMAR2	*Tamarix*	tamarisk	Tamaricaceae	No
TEDI	*Tetracoccus dioicus*	red shrubby-spurge	Euphorbiaceae	Yes
TECO2	*Tetradymia comosa*	hairy horsebrush	Asteraceae	Yes
THALI2	*Thalictrum*	meadow-rue	Ranunculaceae	Yes
THFE	*Thalictrum fendleri*	Fendler's meadow-rue	Ranunculaceae	Yes
THMO	*Thamnosma montana*	turpentinebroom	Rutaceae	Yes
THYSA	*Thysanocarpus*	fringepod	Brassicaceae	Yes
THCU	*Thysanocarpus curvipes*	sand fringepod	Brassicaceae	Yes
THLA3	*Thysanocarpus laciniatus*	mountain fringepod	Brassicaceae	Yes
TONO	*Torilis nodosa*	knotted hedgeparsley	Apiaceae	No
TODI	*Toxicodendron diversilobum*	Poison oak	Anacardiaceae	Yes
TRICH9	*Trichostema*	bluecurls	Lamiaceae	Yes
TRPA3	*Trichostema parishii*	Parish's bluecurls	Lamiaceae	Yes

Code	Scientific Name	Common Name	Family	Native
TRIFO	*Trifolium*	clover	Fabaceae	Unknown
TRMI4	*Trifolium microcephalum*	smallhead clover	Fabaceae	Yes
TROB2	*Trifolium obtusiflorum*	clammy clover	Fabaceae	Yes
TRGR5	*Tropidocarpum gracile*	dobie pod	Brassicaceae	Yes
TYPHA	*Typha*	cattail	Typhaceae	Yes
TYDO	*Typha domingensis*	southern cattail	Typhaceae	Yes
TYLA	*Typha latifolia*	broad-leaved cattail	Typhaceae	Yes
UMCA	*Umbellularia californica*	California laurel	Lauraceae	Yes
URLI5	*Uropappus lindleyi*	Lindley's silverpuffs	Asteraceae	Yes
URTIC	*Urtica*	nettle	Urticaceae	Unknown
URDI	*Urtica dioica*	stinging nettle	Urticaceae	Yes
URUR	*Urtica urens*	dwarf nettle	Urticaceae	No
VECA2	*Veratrum californicum*	California false hellebore	Liliaceae	Yes
VICIA	*Vicia*	vetch	Fabaceae	Unknown
VIMA	*Vinca major*	bigleaf periwinkle	Apocynaceae	No
VIOLA	*Viola*	violet	Violaceae	Unknown
VIPE3	*Viola pedunculata*	Johnny-jump-up	Violaceae	Yes
VIPU4	*Viola purpurea*	goosefoot violet	Violaceae	Yes
VIGI2	*Vitis girdiana*	desert wild grape	Vitaceae	Yes
VULPI	*Vulpia*	fescue	Poaceae	Unknown
VUBR	*Vulpia bromoides*	brome fescue	Poaceae	No
VUMI	*Vulpia microstachys*	small fescue	Poaceae	Yes
VUMY	*Vulpia myuros*	rat-tail fescue	Poaceae	No
WASHI	*Washingtonia*	fan palm	Arecaceae	Unknown
XAST	*Xanthium strumarium*	rough cockleburr	Asteraceae	Yes
XYBI	*Xylococcus bicolor*	mission manzanita	Ericaceae	Yes
YUSC2	*Yucca schidigera*	Mojave yucca	Agavaceae	Yes
YUWH	*Yucca whipplei*	chaparral yucca	Agavaceae	Yes
ZIPA	*Ziziphus parryi*	Parry's jujube	Rhamnaceae	Yes

APPENDIX 3. Noteworthy plant species and their state and federal rarity status.

***Abronia villosa* var. *aurita* (chaparral sand-verbena)**
CNPS List 1B
CNPS R-E-D Code is 2-3-2
Global rank is G5T2T3, and state rank is S2.1
Federal status is None, and state status is None

This species is found in chaparral, coastal scrub, and desert dunes (sandy soil) from 80-1600 meters elevation. It is threatened by flood control activities, vehicles, and development. It is known from Orange, Riverside, San Bernardino, and San Diego Counties in California. It also occurs in Baja, California and Arizona (CNPS 2005).

***Arctostaphylos rainbowensis* (rainbow manzanita)**
CNPS List 1B
CNPS R-E-D Code is 3-3-3
Global rank is G2, and state rank is S2.1
Federal status is FE, and state status is None

This species is found in chaparral from 225-640 meters elevation. It is threatened by agricultural conversion. It is only known from Riverside and San Diego Counties in California (CNPS 2005).

***Atriplex coronata* var. *notatior* (San Jacinto Valley crownscale)**
CNPS List 1B
CNPS R-E-D Code is 3-3-3
Global rank is G4T1, and state rank is S1.1
Federal status is FE, and state status is None

This species is found in playas, valley and foothill grassland, vernal pools (alkaline soil) from 380-500 meters elevation. It is threatened by flood control, agriculture, urbanization, vehicles, and pipeline construction. It is only known from Riverside County in California (CNPS 2005).

***Calochortus plummerae* (Plummer's mariposa lily)**
CNPS List 1B
CNPS R-E-D Code is 2-2-3
Global rank is G3, and state rank is S3.2
Federal status is None, and state status is None

This species is found in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grassland (granitic soil) from 100-1700 meters elevation. The species is significantly reduced by development, and continues to decline. It is found in Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties in California (CNPS 2005).

***Caulanthus simulans* (Payson's jewel-flower)**
CNPS List 4
CNPS R-E-D Code is 1-2-3
Global rank is G3, and state rank is S3.2
Federal status is None, and state status is None

This species is found in chaparral and coastal scrub (sandy granitic soil) from 90-2200 meters elevation. Some populations of this species are threatened by proposed reservoir construction, but many populations occur on public lands. The species is also threatened by urbanization, grazing, and road construction. It is only known from Riverside and San Diego Counties in California (CNPS 2005).

***Hemizonia pungens* subsp. *laevis* (smooth tarplant)**
CNPS List 1B
CNPS R-E-D Code is 2-3-3
Global rank is G3G4T2 and state rank is S2.1
Federal status is None, and state status is None

This species is found in chenopod scrub, meadows and seeps, playas, riparian woodland, and valley and foothill grassland (alkaline soil) from 0-480 meters elevation. It is threatened by agriculture, urbanization, and flood control projects. The species is known from Orange, Riverside, San Bernardino, and San Diego Counties in California (CNPS 2005).

***Mimulus diffusus* (Palomar monkeyflower)**
CNPS List 4
CNPS R-E-D Code is 1-1-1
Global rank is G4Q, and state rank is S3.3
Federal status is None, and state status is None

This species is found in chaparral and lower montane coniferous forest (sandy or gravelly soil) from 1220-1830 meters elevation. It is known from Orange, Riverside, and San Diego Counties in California, and south to Baja California (CNPS 2005).

***Navarretia fossalis* (spreading navarretia)**

CNPS List 1B
CNPS R-E-D Code is 2-3-2
Global rank is G2, and state rank is S2.1
Federal status is FT, and state status is None

This species is found in chenopod scrub, marshes and swamps (assorted shallow freshwater), playas, and vernal pools from 30-1350 meters elevation. It is known to be threatened by urbanization, agriculture, road construction, grazing, flood control, and vehicles. The species is found in Los Angeles, Riverside, San Diego, and San Luis Obispo Counties in California, and south to Baja California (CNPS 2005).

***Quercus engelmannii* (Engelmann oak)**
CNPS List 4
CNPS R-E-D Code is 1-2-2
Global rank is G3, and state rank is S3.2
Federal status is None, and state status is None

This species is found within chaparral, cismontane woodland, riparian woodland, and valley and foothill grassland habitats from 120-1300 meters elevation, including stands that are mainly Engelmann oak woodland. It is threatened by development and grazing, but its habitat is partly protected at the Santa Rosa Plateau Preserve in Western Riverside County. It is found in Los Angeles, Orange, Riverside, and San Diego Counties in California and south to Baja California. It also occurs on Santa Catalina Island, California, though only one tree remains on the island (CNPS 2005).

***Romneya coulteri* (Coulter's matilija poppy)**
CNPS List 4
CNPS R-E-D Code is 1-2-3
Global rank is G3, and state rank is S3.2
Federal status is None, and state status is None

This species is found in chaparral and coastal scrub (often in burns) from 20-1200 meters elevation. It is threatened by urbanization, flood control, and road widening and maintenance. It is found in Los Angeles, Orange, Riverside, and San Diego Counties in California (CNPS 2005)

***Tetracoccus dioicus* (Parry's tetracoccus)**
CNPS List 1B
CNPS R-E-D Code is 3-3-2
Global rank is G3, and state rank is S2.2
Federal status is None, and state status is None

This species is found in chaparral and coastal scrub from 165-1000 meters elevation. It is threatened by agriculture and development. The species is found in Orange, Riverside, and San Diego Counties in California, and south to Baja California (CNPS 2005).

APPENDIX 4. Crosswalk of vegetation classification systems from Alliances and Associations in the Floristic National Vegetation Classification System (NVCS) per NatureServe (2005) to potential Holland (1986), WHR (Mayer and Laudenslayer 1988), and collapsed MSHCP (2001) types.

Alliance	Association	Code	Holland	Code	CWHR	MSHCP
Tree-Overstory Vegetation						
Abies concolor-Calocedrus decurrens	*Abies concolor-Calocedrus decurrens-Pinus jeffreyi*	85320, 84230	Southern California White Fir Forest, Sierran Mixed Conifer Forest	WFR, SMC	White Fir, Sierran Mixed Conifer	Montane Coniferous Forest
Abies concolor-Pinus lambertiana	*Abies concolor-Pinus lambertiana-Calocedrus decurrens-Quercus chrysolepis*	85320, 84230	Southern California White Fir Forest, Sierran Mixed Conifer Forest	WFR, SMC	White Fir, Sierran Mixed Conifer	Montane Coniferous Forest
Abies concolor-Pinus lambertiana	*Abies concolor-Pinus lambertiana-Pinus jeffreyi*	85320, 84230	Southern California White Fir Forest, Sierran Mixed Conifer Forest	WFR, SMC	White Fir, Sierran Mixed Conifer	Montane Coniferous Forest
Alnus rhombifolia	*Alnus rhombifolia*	61510	White Alder Riparian Forest	MRI	Montane Riparian	Riparian Scrub, Woodland, Forest
Alnus rhombifolia	*Alnus rhombifolia-Platanus racemosa*	62400	Southern Sycamore-Alder Riparian Woodland	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Eucalyptus spp.	Alliance only	62000	Riparian Woodland	EUC	Eucalyptus	Riparian Scrub, Woodland, Forest
Calocedrus decurrens	*Calocedrus decurrens-Quercus chrysolepis-Quercus kelloggii*	84230	Sierran Mixed Conifer Forest	SMC, MHC	Sierran Mixed Conifer, Montane Hardwood - Conifer	Montane Coniferous Forest
Pinus attenuata	*Pinus attenuata/Arctostaphylos glandulosa*	83210	Knobcone Pine Forest	CPC	Closed-cone Pine - Cypress	Montane Coniferous Forest
Pinus contorta	Alliance only	86100	Lodgepole Pine Forest	LPN	Lodgepole Pine	Montane Coniferous Forest
Pinus coulteri	*Pinus coulteri/Arctostaphylos glandulosa-Quercus wislizeni*	84140	Coulter Pine Forest	MHC	Montane Hardwood - Conifer	Montane Coniferous Forest
Pinus coulteri	*Pinus coulteri/Quercus wislizeni*	84140	Coulter Pine Forest	MHC	Montane Hardwood - Conifer	Montane Coniferous Forest
Pinus coulteri-Quercus chrysolepis	*Pinus coulteri-Quercus chrysolepis/Arctostaphylos pringlei*	84140	Coulter Pine Forest	MHC	Montane Hardwood - Conifer	Montane Coniferous Forest
Pinus flexilis	*Pinus flexilis-Pinus contorta/Chrysolepis sempervirens*	86500	Southern California Subalpine Forest	SCN	Subalpine Conifer	Montane Coniferous Forest

Alliance	Association	Code	Holland	Code	CWHR	MSHCP
Pinus jeffreyi	*Pinus jeffreyi*/*Artemisia tridentata*/*Penstemon centranthifolius*	85100	Jeffrey Pine Forest	JPN	Jeffrey Pine	Montane Coniferous Forest
Pinus jeffreyi	*Pinus jeffreyi*/*Quercus palmeri*	85100	Jeffrey Pine Forest	JPN	Jeffrey Pine	Montane Coniferous Forest
Pinus jeffreyi	*Pinus jeffreyi*/*Quercus wislizeni*	85100	Jeffrey Pine Forest	JPN	Jeffrey Pine	Montane Coniferous Forest
Pinus jeffreyi	*Pinus jeffreyi-Abies concolor*/*Chrysolepis sempervirens*	85210	Jeffrey Pine-Fir Forest	SMC	Sierran Mixed Conifer	Montane Coniferous Forest
Pinus jeffreyi	*Pinus jeffreyi-Quercus kelloggii*	85100	Jeffrey Pine Forest	JPN	Jeffrey Pine	Montane Coniferous Forest
Pinus quadrifolia	*Pinus quadrifolia*/*Quercus cornelius-mulleri*	72310	Peninsular Pinyon Woodland	PJN	Pinyon - Juniper	Woodland and Forests
Platanus racemosa	*Platanus racemosa*/Annual Grass-Herb	62400	Southern Sycamore-Alder Riparian Woodland	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Platanus racemosa	*Platanus racemosa-Salix laevigata*/*Salix lasiolepis-Baccharis salicifolia*	62400	Southern Sycamore-Alder Riparian Woodland	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Platanus racemosa-Populus fremontii	*Platanus racemosa-Populus fremontii*/*Salix lasiolepis*	61330	Southern Cottonwood-Willow Riparian Forest	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Platanus racemosa-Populus fremontii	*Platanus racemosa-Populus fremontii*/*Salix lasiolepis-Salix exigua*/*Scirpus americanus*	61330	Southern Cottonwood-Willow Riparian Forest	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Populus fremontii	*Populus fremontii*/*Baccharis salicifolia*	61330	Southern Cottonwood-Willow Riparian Forest	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Populus fremontii	*Populus fremontii-Salix gooddingii*/*Baccharis salicifolia*	61330	Southern Cottonwood-Willow Riparian Forest	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Populus fremontii	*Populus fremontii-Salix laevigata*	61330	Southern Cottonwood-Willow Riparian Forest	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Populus fremontii	*Populus fremontii-Salix laevigata*/*Salix lasiolepis*/*Vitis girdiana*	61330	Southern Cottonwood-Willow Riparian Forest	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Populus fremontii	*Populus fremontii-Salix laevigata*/*Salix lasiolepis-Baccharis salicifolia*	61330	Southern Cottonwood-Willow Riparian Forest	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Pseudotsuga macrocarpa	*Pseudotsuga macrocarpa-Quercus chrysolepis*	84150	Bigcone Spruce-Canyon Oak Forest	MHC	Montane Hardwood - Conifer	Montane Coniferous Forest
Quercus agrifolia	*Quercus agrifolia*/Annual Grass-Herb	71160, 81310	Coast Live Oak Woodland, Coast Live Oak Forest	COW	Coastal Oak Woodland	Woodland and Forests

Alliance	Association	Code	Holland	Code	CWHR	MSHCP
Quercus agrifolia	*Quercus agrifolia*/Chaparral	71160, 81310	Coast Live Oak Woodland, Coast Live Oak Forest	COW	Coastal Oak Woodland	Woodland and Forests
Quercus agrifolia	*Quercus agrifolia*/*Toxicodendron diversilobum* Riparian	61310	Southern Coast Live Oak Riparian Forest	COW	Coastal Oak Woodland	Woodland and Forests
Quercus agrifolia	*Quercus agrifolia*/*Toxicodendron diversilobum*/Grass	71160, 81310	Coast Live Oak Woodland, Coast Live Oak Forest	COW	Coastal Oak Woodland	Woodland and Forests
Quercus agrifolia	*Quercus agrifolia-Platanus racemosa*/*Toxicodendron diversilobum*	61310	Southern Coast Live Oak Riparian Forest	COW	Coastal Oak Woodland	Woodland and Forests
Quercus agrifolia	*Quercus agrifolia-Platanus racemosa-Salix laevigata*	61310	Southern Coast Live Oak Riparian Forest	COW	Coastal Oak Woodland	Woodland and Forests
Quercus chrysolepis	*Quercus chrysolepis*	81320	Canyon Live Oak Forest	MHW	Montane Hardwood	Woodland and Forests
Quercus chrysolepis	*Quercus chrysolepis-Pinus jeffreyi*	81320	Canyon Live Oak Forest	MHC	Montane Hardwood - Conifer	Woodland and Forests
Quercus chrysolepis	*Quercus chrysolepis-Pseudotsuga macrocarpa*	84150	Bigcone Spruce-Canyon Oak Forest	MHC	Montane Hardwood - Conifer	Woodland and Forests
Quercus engelmannii	*Quercus engelmannii*/*Quercus berberidifolia*	71181	Open Engelmann Oak Woodland	COW	Coastal Oak Woodland	Woodland and Forests
Quercus engelmannii	*Quercus engelmannii*/*Toxicodendron diversilobum*/Grass	71181	Open Engelmann Oak Woodland	COW	Coastal Oak Woodland	Woodland and Forests
Quercus engelmannii	*Quercus engelmannii-Quercus agrifolia*/*Artemisia californica*	71182	Dense Engelmann Oak Woodland	COW	Coastal Oak Woodland	Woodland and Forests
Quercus engelmannii	*Quercus engelmannii-Quercus agrifolia*/*Toxicodendron diversilobum*/Annual Grass-Herb	71182	Dense Engelmann Oak Woodland	COW	Coastal Oak Woodland	Woodland and Forests
Quercus kelloggii	*Quercus kelloggii-Pinus coulteri*/*Arctostaphylos glandulosa*	84140	Coulter Pine Forest	MHW, MHC	Montane Hardwood, Montane Hardwood - Conifer	Montane Coniferous Forest
Quercus kelloggii	*Quercus kelloggii-Pinus coulteri*/*Arctostaphylos pringlei*	84140	Coulter Pine Forest	MHW, MHC	Montane Hardwood, Montane Hardwood - Conifer	Montane Coniferous Forest
Salix gooddingii	*Salix gooddingii*	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Salix gooddingii	*Salix gooddingii*/*Baccharis salicifolia*	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest

Alliance	Association	Code	Holland	Code	CWHR	MSHCP
Salix gooddingii	*Salix gooddingii/Lepidium latifolium*	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Salix gooddingii	*Salix gooddingii-Salix lucida-Populus fremontii*	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Salix laevigata	*Salix laevigata/Salix lasiolepis/Artemisia douglasiana*	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Shrub-Overstory Vegetation						
Adenostoma fasciculatum	*Adenostoma fasciculatum* Disturbance	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum	*Adenostoma fasciculatum* Pure	37200	Chamise Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum	*Adenostoma fasciculatum-Arctostaphylos pringlei*	37110	Northern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum	*Adenostoma fasciculatum-Eriogonum fasciculatum*	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum	*Adenostoma fasciculatum-Eriogonum fasciculatum-Salvia apiana*	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum	*Adenostoma fasciculatum-Malosma laurina*	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Arctostaphylos glandulosa	*Adenostoma fasciculatum-Arctostaphylos glandulosa*	37110	Northern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Arctostaphylos glandulosa	*Adenostoma fasciculatum-Arctostaphylos glandulosa-Ceanothus crassifolius*	37110	Northern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Arctostaphylos glandulosa	*Adenostoma fasciculatum-Arctostaphylos glandulosa-Ceanothus leucodermis*	37110	Northern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Arctostaphylos glauca	*Adenostoma fasciculatum-Arctostaphylos glauca*	37110	Northern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Arctostaphylos glauca	*Adenostoma fasciculatum-Arctostaphylos glauca-Rhus ovata*	37110	Northern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Ceanothus crassifolius	*Adenostoma fasciculatum-Ceanothus crassifolius-Rhus ovata*	37830	Ceanothus crassifolius Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Ceanothus crassifolius	*Adenostoma fasciculatum-Ceanothus crassifolius-Salvia mellifera*	37830	Ceanothus crassifolius Chaparral	MCH	Mixed Chaparral	Chaparral

Alliance	Association	Code	Holland	Code	CWHR	MSHCP
Adenostoma fasciculatum-Ceanothus cuneatus	Alliance only	37110	Northern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Ceanothus greggii	*Adenostoma fasciculatum-Ceanothus greggii*	37400	Semi-Desert Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Salvia apiana	*Adenostoma fasciculatum-Salvia apiana-Artemisia californica*	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Salvia mellifera	*Adenostoma fasciculatum-Salvia mellifera*	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Salvia mellifera	*Adenostoma fasciculatum-Salvia mellifera-Artemisia californica*	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Salvia mellifera	*Adenostoma fasciculatum-Salvia mellifera-Ceanothus crassifolius*	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Xylococcus bicolor	*Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus crassifolius*	37120	Southern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Xylococcus bicolor	*Adenostoma fasciculatum-Xylococcus bicolor-Quercus berberidifolia*	37120	Southern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma fasciculatum-Xylococcus bicolor	*Adenostoma fasciculatum-Xylococcus bicolor-Salvia mellifera-Malosma laurina*	37C30	Southern Maritime Chaparral	MCH	Mixed Chaparral	Chaparral
Adenostoma sparsifolium	*Adenostoma sparsifolium-Artemisia tridentata*	37300	Redshank Chaparral	CRC	Chamise-Red Shank Chaparral	Chaparral
Adenostoma sparsifolium	*Adenostoma sparsifolium-Ceanothus crassifolius*	37300	Redshank Chaparral	CRC	Chamise-Red Shank Chaparral	Chaparral
Adenostoma sparsifolium	*Adenostoma sparsifolium-Ceanothus cuneatus*	37300	Redshank Chaparral	CRC	Chamise-Red Shank Chaparral	Chaparral
Adenostoma sparsifolium	*Adenostoma sparsifolium-Ericameria linearifolia-Eriogonum fasciculatum-Opuntia basilaris*	37300	Redshank Chaparral	CRC	Chamise-Red Shank Chaparral	Chaparral
Adenostoma sparsifolium	*Adenostoma sparsifolium-Eriogonum fasciculatum-Lotus scoparius*	37300	Redshank Chaparral	CRC	Chamise-Red Shank Chaparral	Chaparral
Adenostoma sparsifolium-Adenostoma fasciculatum	*Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos glauca*	37300	Redshank Chaparral	CRC	Chamise-Red Shank Chaparral	Chaparral
Adenostoma sparsifolium-Adenostoma fasciculatum	*Adenostoma sparsifolium-Adenostoma fasciculatum-Arctostaphylos pungens*	37300	Redshank Chaparral	CRC	Chamise-Red Shank Chaparral	Chaparral

Alliance	Association	Code	Holland	Code	CWHR	MSHCP
Adenostoma sparsifolium-Adenostoma fasciculatum	*Adenostoma sparsifolium-Adenostoma fasciculatum-Ceanothus greggii*	37300	Redshank Chaparral	CRC	Chamise-Red Shank Chaparral	Chaparral
Adenostoma sparsifolium-Adenostoma fasciculatum	*Adenostoma sparsifolium-Adenostoma fasciculatum-Opuntia parryi*	37300	Redshank Chaparral	CRC	Chamise-Red Shank Chaparral	Chaparral
Adenostoma sparsifolium-Cercocarpus betuloides	*Adenostoma sparsifolium-Cercocarpus betuloides-Adenostoma fasciculatum*	37300	Redshank Chaparral	CRC	Chamise-Red Shank Chaparral	Chaparral
Arctostaphylos glandulosa	*Arctostaphylos glandulosa*	37520	Montane Manzanita Chaparral	MCH	Mixed Chaparral	Chaparral
Arctostaphylos glandulosa	*Arctostaphylos glandulosa-Arctostaphylos pringlei*	37520	Montane Manzanita Chaparral	MCH	Mixed Chaparral	Chaparral
Artemisia californica	*Artemisia californica/Amsinckia menziesii*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Artemisia californica	*Artemisia californica-Malosma laurina*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Artemisia californica-Eriogonum fasciculatum	*Artemisia californica-Eriogonum fasciculatum*	32500, 32700	Diegan Coastal Sage Scrub, Riversidian Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Artemisia californica-Eriogonum fasciculatum	*Artemisia californica-Eriogonum fasciculatum-Malosma laurina*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Artemisia californica-Eriogonum fasciculatum	*Artemisia californica-Eriogonum fasciculatum-Salvia apiana*	32520	Inland Diegan Coastal Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Artemisia californica-Salvia apiana	*Artemisia californica-Salvia apiana*	32520	Inland Diegan Coastal Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Artemisia californica-Salvia mellifera	*Artemisia californica-Salvia mellifera*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Artemisia tridentata	*Artemisia tridentata*	35210	Big Sagebrush Scrub	SGB	Sagebrush	Desert Scrub
Artemisia tridentata	*Artemisia tridentata-Eriogonum fasciculatum*	35210	Big Sagebrush Scrub	SGB	Sagebrush	Desert Scrub
Artemisia tridentata	*Artemisia tridentata-Eriogonum wrightii*	35210	Big Sagebrush Scrub	SGB	Sagebrush	Desert Scrub
Baccharis salicifolia	*Baccharis salicifolia-Sambucus mexicana*	63310	Mulefat Scrub	FEW	Freshwater Emergent Wetland	Riparian Scrub, Woodland, Forest
Ceanothus crassifolius	*Ceanothus crassifolius-Adenostoma fasciculatum-Xylococcus bicolor*	37830	Ceanothus crassifolius Chaparral	MCH	Mixed Chaparral	Chaparral
Ceanothus crassifolius	*Ceanothus crassifolius-Cercocarpus betuloides*	37830	Ceanothus crassifolius Chaparral	MCH	Mixed Chaparral	Chaparral

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Ceanothus crassifolius	*Ceanothus crassifolius-Malosma laurina*	37830	Ceanothus crassifolius Chaparral	MCH	Mixed Chaparral	Chaparral
Ceanothus cuneatus	Alliance only	37810	Buckbrush Chaparral	MCH	Mixed Chaparral	Chaparral
Ceanothus integerrimus	Alliance only	37531	Deer Brush Chaparral	MCH	Mixed Chaparral	Chaparral
Ceanothus leucodermis	*Ceanothus leucodermis*	37532	Whitethorn Chaparral	MCH	Mixed Chaparral	Chaparral
Ceanothus oliganthus	*Ceanothus oliganthus-Adenostoma fasciculatum*	37120	Southern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Ceanothus oliganthus	*Ceanothus oliganthus-Arctostaphylos glandulosa*	37120	Southern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Ceanothus oliganthus	*Ceanothus oliganthus-Eriodictyon crassifolium*	37120	Southern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Cercocarpus betuloides	*Cercocarpus betuloides*	37E00	Mesic North Slope Chaparral	MCH	Mixed Chaparral	Chaparral
Cercocarpus betuloides	*Cercocarpus betuloides-Prunus ilicifolia-Adenostoma sparsifolium*	37E00	Semi-Desert Chaparral	MCH	Mixed Chaparral	Chaparral
Cercocarpus betuloides-Eriogonum fasciculatum	*Cercocarpus betuloides-Eriogonum fasciculatum*	37400	Semi-Desert Chaparral	MCH	Mixed Chaparral	Chaparral
Cercocarpus betuloides-Eriogonum fasciculatum	*Cercocarpus betuloides-Eriogonum fasciculatum-Eriogonum wrightii*	37400	Semi-Desert Chaparral	MCH	Mixed Chaparral	Chaparral
Encelia californica	*Encelia californica-Artemisia californica*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Encelia farinosa	*Encelia farinosa*	32710	Riversidian Upland Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Encelia farinosa	*Encelia farinosa-Artemisia californica*	32710	Riversidian Upland Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Ericameria palmeri	Alliance only	32700	Riversidian Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Eriodictyon crassifolium	Alliance only	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Coastal Sage Scrub
Eriogonum fasciculatum	*Eriogonum fasciculatum*	32500, 32700, 37K00	Diegan Coastal Sage Scrub, Riversidian Sage Scrub, Flat-topped Buckwheat	CSC	Coastal Scrub	Coastal Sage Scrub
Eriogonum fasciculatum	*Eriogonum fasciculatum-Bebbia juncea*	32700	Riversidian Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Eriogonum fasciculatum	*Eriogonum fasciculatum-Gutierrezia sarothrae*	39000	Upper Sonoran Subshrub Scrub	CSC	Coastal Scrub	Coastal Sage Scrub

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Eriogonum fasciculatum	*Eriogonum fasciculatum-Opuntia parryi*	32730	Riversidian Desert Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Eriogonum fasciculatum	*Eriogonum fasciculatum-Rhus ovata*	37400	Semi-Desert Chaparral	CSC	Coastal Scrub	Coastal Sage Scrub
Eriogonum fasciculatum	*Eriogonum fasciculatum-Simmondsia chinensis-Opuntia parryi*	32730	Riversidian Desert Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Eriogonum fasciculatum-Encelia farinosa	*Eriogonum fasciculatum-Encelia farinosa*	32710	Riversidian Upland Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Eriogonum fasciculatum-Salvia apiana	*Eriogonum fasciculatum-Salvia apiana*	32710	Riversidian Upland Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Eriogonum wrightii	Alliance only	39000	Upper Sonoran Subshrub Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Forestiera pubescens	*Forestiera pubescens-Salix spp*.	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Heteromeles arbutifolia	*Heteromeles arbutifolia-Artemisia californica*	37E00	Mesic North Slope Chaparral	MCH	Mixed Chaparral	Chaparral
Heteromeles arbutifolia	*Heteromeles arbutifolia-Quercus berberidifolia-Cercocarpus betuloides-Fraxinus dipetala*	37E00	Mesic North Slope Chaparral	MCH	Mixed Chaparral	Chaparral
Juniperus californica	*Juniperus californica*/Annual Grass-Herb	72320	Peninsular Juniper Woodland and Scrub	JUN	Juniper	Woodland and Forests
Juniperus californica	*Juniperus californica-Adenostoma fasciculatum-Eriogonum fasciculatum*	72320	Peninsular Juniper Woodland and Scrub	JUN	Juniper	Woodland and Forests
Juniperus californica	*Juniperus californica-Eriogonum fasciculatum-Artemisia californica*	72320	Peninsular Juniper Woodland and Scrub	JUN	Juniper	Woodland and Forests
Keckiella antirrhinoides	*Keckiella antirrhinoides*	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Coastal Sage Scrub
Keckiella antirrhinoides	*Keckiella antirrhinoides-Artemisia californica*	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Coastal Sage Scrub
Keckiella antirrhinoides	*Keckiella antirrhinoides-Eriogonum fasciculatum*	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Coastal Sage Scrub
Keckiella antirrhinoides	*Keckiella antirrhinoides*-Mixed Chaparral	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral	Coastal Sage Scrub
Lepidospartum squamatum	*Lepidospartum squamatum*/*Amsinckia menziesii*	32720	Riversidian Alluvial Fan Scrub	CSC	Coastal Scrub	Riversidean Alluvial Fan Sage Scrub

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Lepidospartum squamatum	*Lepidospartum squamatum-Atriplex canescens*	32720	Riversidian Alluvial Fan Scrub	CSC	Coastal Scrub	Riversidean Alluvial Fan Sage Scrub
Lepidospartum squamatum	*Lepidospartum squamatum-Baccharis salicifolia*	32720	Riversidian Alluvial Fan Scrub	CSC	Coastal Scrub	Riversidean Alluvial Fan Sage Scrub
Lepidospartum squamatum	*Lepidospartum squamatum-Eriogonum fasciculatum*	32720	Riversidian Alluvial Fan Scrub	CSC	Coastal Scrub	Riversidean Alluvial Fan Sage Scrub
Lotus scoparius	Alliance only	37G00	Coastal Sage - Chaparral Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Lycium andersonii	Alliance only	32730	Riversidian Desert Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Malacothamnus fasciculatus	Alliance only	37G00	Coastal Sage - Chaparral Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Malosma laurina	*Malosma laurina-Eriogonum fasciculatum*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Malosma laurina	*Malosma laurina-Eriogonum fasciculatum-Salvia apiana*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Malosma laurina	*Malosma laurina-Eriogonum fasciculatum-Salvia mellifera*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Malosma laurina	*Malosma laurina-Tetracoccus dioicus*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Opuntia littoralis	Alliance only	32400	Maritime Succulent Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Prosopis glandulosa	*Prosopis glandulosa-Sambucus mexicana*	61820	Mesquite Bosque	DRI, DSW	Desert Riparian, Desert Wash	Riparian Scrub, Woodland, Forest
Prunus ilicifolia	*Prunus ilicifolia-Heteromeles arbutifolia*	37E00	Mesic North Slope Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus berberidifolia	*Quercus berberidifolia*	37900	Scrub Oak Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus berberidifolia	*Quercus berberidifolia-Fraxinus dipetala-Heteromeles arbutifolia*	37110	Northern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus berberidifolia	*Quercus berberidifolia*-Southern Mixed Chaparral	37110	Northern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus berberidifolia-Adenostoma fasciculatum	*Quercus berberidifolia-Adenostoma fasciculatum*	37110	Northern Mixed Chaparral	MCH, CRC	Mixed Chaparral, Chamise-Red Shank Chaparral	Chaparral
Quercus berberidifolia-Adenostoma fasciculatum	*Quercus berberidifolia-Adenostoma fasciculatum-Ceanothus crassifolius*	37110	Northern Mixed Chaparral	MCH, CRC	Mixed Chaparral, Chamise-Red Shank Chaparral	Chaparral

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Quercus berberidifolia-Cercocarpus betuloides	*Quercus berberidifolia-Cercocarpus betuloides*	37900	Scrub Oak Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus berberidifolia-Cercocarpus betuloides	*Quercus berberidifolia-Cercocarpus betuloides-Arctostaphylos glauca*	37900	Scrub Oak Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus berberidifolia-Cercocarpus betuloides	*Quercus berberidifolia-Cercocarpus betuloides-Ceanothus crassifolius*	37900	Scrub Oak Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus cornelius-mulleri	*Quercus cornelius-mulleri-Adenostoma sparsifolium-Ceanothus greggii*	37540	Semi-Desert Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus cornelius-mulleri	*Quercus cornelius-mulleri-Adenostoma sparsifolium-Cercocarpus betuloides*	37540	Semi-Desert Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus cornelius-mulleri	*Quercus cornelius-mulleri-Cercocarpus betuloides*	37400	Semi-Desert Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus palmeri	*Quercus palmeri-Eriogonum fasciculatum*	37400	Semi-Desert Chaparral	MCH	Mixed Chaparral	Woodland and Forests
Quercus palmeri	*Quercus palmeri-Eriogonum wrightii*	37400	Semi-Desert Chaparral	MCH	Mixed Chaparral	Woodland and Forests
Quercus wislizeni	*Quercus wislizeni-Adenostoma sparsifolium-Cercocarpus betuloides*	37A00	Interior Live Oak Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus wislizeni	*Quercus wislizeni-Cercocarpus betuloides*	37A00	Interior Live Oak Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus wislizeni-Ceanothus leucodermis	*Quercus wislizeni-Ceanothus leucodermis*	37A00	Interior Live Oak Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus wislizeni-Ceanothus leucodermis	*Quercus wislizeni-Ceanothus leucodermis/Pinus coulteri*	37A00	Interior Live Oak Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus wislizeni-Quercus berberidifolia	*Quercus wislizeni-Quercus berberidifolia*	37A00	Interior Live Oak Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus wislizeni-Quercus berberidifolia	*Quercus wislizeni-Quercus berberidifolia-Fraxinus dipetala*	37A00	Interior Live Oak Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus wislizeni-Quercus chrysolepis	*Quercus wislizeni-Quercus chrysolepis*	37A00	Interior Live Oak Chaparral	MCH	Mixed Chaparral	Chaparral
Quercus wislizeni-Quercus chrysolepis	*Quercus wislizeni-Quercus chrysolepis/Pinus coulteri*	37A00	Interior Live Oak Chaparral	MCH	Mixed Chaparral	Chaparral
Rhamnus tomentella	Alliance only	37110	Northern Mixed Chaparral	MCH	Mixed Chaparral	Chaparral
Rhus ovata	*Rhus ovata-Ziziphus parryi*	37400	Semi-Desert Chaparral	MCH	Mixed Chaparral	Chaparral

Alliance	Association	Code	Holland	Code	CWHR	MSHCP
Rhus trilobata	Alliance only	37500	Montane Chaparral	MCH	Mixed Chaparral	Chaparral
Ribes quercetorum Unique Stands	n/a	37500	Montane Chaparral	MCH	Mixed Chaparral	Coastal Sage Scrub
Salix lasiolepis	Alliance only	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Salvia apiana	*Salvia apiana-Encelia farinosa*	32710	Riversidian Upland Sage Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Salvia mellifera	*Salvia mellifera*	32000	Coastal Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Salvia mellifera	*Salvia mellifera-Lotus scoparius*	32000	Coastal Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Salvia mellifera	*Salvia mellifera-Rhus ovata*	37G00	Coastal Sage - Chaparral Scrub	CSC	Coastal Scrub	Coastal Sage Scrub
Simmondsia chinensis	*Simmondsia chinensis-Eriogonum fasciculatum-Opuntia parryi*	32730	Riversidian Desert Scrub	CSC	Coastal Scrub	Desert Scrub
Suaeda moquinii	Alliance only	45310	Alkali Meadow	ASC	Alkali Desert Scrub	Playas and Vernal Pools
Tamarix spp.	Alliance only	63810	Tamarisk Scrub	VRI	Valley Foothill Riparian	Riparian Scrub, Woodland, Forest
Herbaceous Vegetation						
Amsinckia menziesii	*Amsinckia menziesii-Erodium* spp.	42300	Wildflower Field	AGS	Annual Grassland	Grassland
Anemopsis californica	Alliance only	45400	Freshwater Seep	WTM	Wet Meadow	Meadows and Marshes
Arundo donax	Alliance only	52410	Coastal and Valley Freshwater Marsh	FEW	Freshwater Emergent Wetland	Riparian Scrub, Woodland, Forest
Bromus tectorum	Alliance only	42200, 42300	Non-native grassland, Wildflower Field	AGS	Annual Grassland	Grassland
California Annual Grassland	*Bromus diandrus*-Mixed Herb	42200, 42300	Non-native grassland, Wildflower Field	AGS	Annual Grassland	Grassland
California Annual Grassland	*Bromus madritensis*-Mixed Herb	42200, 42300	Non-native grassland, Wildflower Field	AGS	Annual Grassland	Grassland
California Annual Grassland	*Hemizonia fasciculata*-Annual Grass-Herb	42200, 42300	Non-native grassland, Wildflower Field	AGS	Annual Grassland	Grassland
Eleocharis macrostachya	*Eleocharis macrostachya-Eryngium aristulatum* subsp. *parishii*	52410	Coastal and Valley Freshwater Marsh	FEW	Fresh Emergent Wetland	Meadows and Marshes, Playas and Vernal Pools

Alliance	Association	Code	Holland	Code	CWHR	MSHCP
Hemizonia pungens subsp. *laevis* Unique Stands	n/a	45310	Alkali Meadow	WTM	Wet Meadow	Playas and Vernal Pools
Hordeum depressum	*Hordeum depressum-Hemizonia fasciculata-Atriplex coronata* var. *notatior*	45310	Alkali Meadow	WTM	Wet Meadow	Playas and Vernal Pools
Kochia scoparia	*Kochia scoparia-Bassia hyssopifolia*	45310	Alkali Meadow	ASC	Alkali Desert Scrub	Developed/Disturbed Land
Lasthenia californica	*Lasthenia californica-Atriplex coronata* var. *notatior*	45310	Alkali Meadow	WTM	Wet Meadow	Playas and Vernal Pools
Lepidium latifolium	Alliance only	52410	Coastal and Valley Freshwater Marsh	FEW	Freshwater Emergent Wetland	Developed/Disturbed Land
Muhlenbergia rigens	Alliance only	42100	Native Grassland	PGS	Perennial Grassland	Grassland
Nassella pulchra	*Nassella pulchra-Erodium spp.-Avena barbata*	42110	Valley Needlegrass Grassland	PGS	Perennial Grassland	Grassland
Plagiobothrys leptocladus Unique Stands	n/a	44310	Southern Interior Basalt Flow Vernal Pool	WTM	Wet Meadow	Playas and Vernal Pools
Salsola tragus	Alliance only	45310	Alkali Meadow	ASC	Alkali Desert Scrub	Developed/Disturbed Land
Scirpus spp.-Typha spp.	Alliance only	52410	Coastal and Valley Freshwater Marsh	FEW	Fresh Emergent Wetland	Meadows and Marshes
Sporobolus airoides	Alliance only	45310	Alkali Meadow	WTM	Wet Meadow	Grassland
Vernal Alkali Plain, Vernal Pool, and Vernal Playa Habitats	n/a	45310, 44310	Alkali Meadow, Southern Interior Basalt Flow Vernal Pool	WTM	Wet Meadow	Playas and Vernal Pools