Vegetation alliances of the San Dieguito River Park region, San Diego County, California

By

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INTRODUCTION

The Vegetation Program of the California Native Plant Society (CNPS) has worked collaboratively with local and regional agencies, including the California Department of Fish and Game (CDFG), in producing a vegetation classification and map of the San Dieguito River Park. The San Dieguito River Park occurs in San Diego County, California, and extends 55 miles from San Dieguito Lagoon at Del Mar to its headwaters in the Peninsular Range at Volcan Mountain. At least 86 different plant communities, described floristically at the alliance level of the National Vegetation Classification (Grossman et al. 1998), are discussed in this report.

Two main project goals are 1) to provide detailed, floristic classification of the vegetation and a report defining the different vegetation types, 2) to provide a detailed vegetation map of the region. Field data are being collected using standard CNPS and CDFG protocols (e.g., vegetation rapid assessment protocol), and these data and color imagery are being analyzed to create the classification and maps.

The field-based classification depicts vegetation types that were sampled and identified in 579 vegetation rapid assessments. The classification follows the National Vegetation Classification System's hierarchy of alliances and associations. These are floristically and environmentally defined plant communities, such as those described in the CNPS publication of *A Manual of California Vegetation* (Sawyer and Keeler Wolf 1995). In this project, the vegetation types are depicted in standard descriptions and a field key to concisely differentiate 86 alliances, 2 unique stands, and 103 associations.

In a parallel effort, the alliance and association-level classification is being used to create a vegetation map at a fine-scale resolution (minimum mapping unit of 1/2-1 acre). The map is being created by interpreting detailed, digital color aerial photography and delineating boundaries around the individual stands of vegetation in the study area. This detailed map is being produced in a Geographic Information System (GIS) digital format, through a "head's-up" digitizing process. With the field data collected and classified, the mapping is guided by the 579 rapid assessments and 595 reconnaissance points. The final map will include digitization of polygons and attribution of the vegetation type, tree cover, shrub cover, herb cover, tree size, site quality and impacts.

Over the past 15 years, there has been a proliferation of Habitat Conservation Plans (HCP) and Natural Communities Conservation Planning programs in southern California; however, these projects suffer from a lack of sufficient field vegetation information. Presently, only coarse-scale vegetation maps exist from the San Diego County Multiple Species Conservation Planning area, in which the vegetation is not precisely defined or mapped. Thus, collection of detailed field data for floristic vegetation classification and mapping will assist in more appropriate conservation and management decisions to sustain California's natural and unique resources. The San Dieguito vegetation descriptions and map will be shared with local and regional organizations and agencies for land management and conservation purposes.

This is the first time a collaborative vegetation project has provided detailed vegetation and site quality information over the range of biodiversity in this portion of California, from the interior mountain drainage to the coastal lagoon of the San Dieguito. With a fine-scale vegetation classification and map, we can be more certain that the full range of ecological variability is captured in the San Dieguito River Park. As each vegetation type is mapped, it has reference ground data so that the vegetation types can be compared quantitatively. In the maps, baseline floristic, structural, and site impact information is captured in a defensible manner. Once we have a map of scientifically and quantitatively based units, we can determine location, acreage, numbers and quality of vegetation types. Ensuring representation of each vegetation type will assist in ecological sustenance of the region. In the future, agencies can compare areas based on vegetation diversity and habitat quality to identify conservation values for such things as land acquisition, proper placement of trail systems, restoration, and other management in the River Park.

CNPS is currently collaborating with a variety of local and state agencies in this project, many of whom own/manage land in the River Park. The CDFG-Wildlife and Data Habitat Analysis Branch and the San Diego Chapter of CNPS have been instrumental in providing work

time in the project. Additionally, private donations and encouragement from San Diego Chapter members assisted in moving this project forward. Further, a local joint powers agency, the San Dieguito River Valley Regional Open Space Park Joint Powers Authority, is responsible for creating a greenway and natural open space park in the San Dieguito River Valley. Other agencies have provided land access or information, including the San Dieguito River Valley Land Conservancy, CDFG Region 5-Lands Program, County of San Diego Parks and Recreation, San Diego Association of Governments, San Diego City Parks, and The Nature Conservancy.

METHODS

Study area

The study area, San Dieguito River Park, extends 55 miles (and approximately 80,000 acres) from the San Dieguito Lagoon at Del Mar in the west to its headwaters in the Peninsular Ranges at Volcan Mountain and the Colorado Desert in the east. See figure 1 for a study area map, which depicts the ecological subsections included in the area. In this broad region, many of San Diego County's sensitive habitats and plant assemblages occur, including coastal sage scrub, coastal salt marsh and herbaceous wetlands, native grasslands, riparian and oak woodlands, conifer forests, and desert scrub. Elevation ranges from sea level to over 5,500 feet.

After the study area was established, an involved process of developing a standardized, quantitative classification of the habitats/vegetation was performed. In brief, the phases can be summarized as follows, and these steps also will be discussed in detail below:

1. Accumulate existing literature and combine into preliminary classification of vegetation types
2. Target the various vegetation types using current field sampling to survey and capture all bio-environments in the study area and fill in the gaps in the existing classification
3. Analyze new samples to develop quantitative classification rules
4. Bring the classification into accordance with the standardized National Vegetation Classification System, and develop a key differentiating the vegetation alliances and associations
5. Develop descriptions to all the alliances of the study area

Existing Literature Review

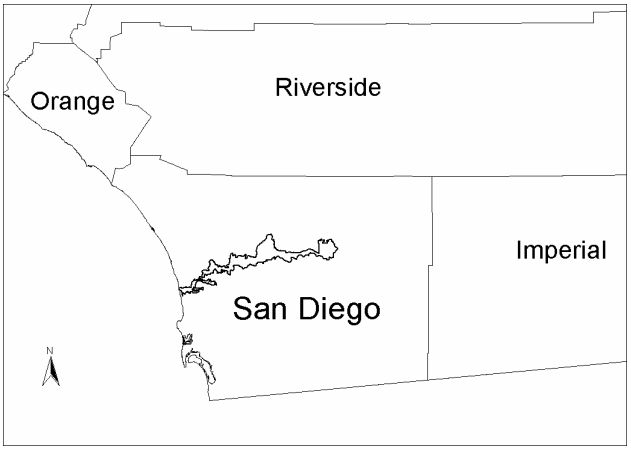
Beginning in early June 2001, information from Sawyer and Keeler-Wolf (1995) and other local reports on vegetation were compiled to obtain the most current view of vegetation types with respect to the U.S. National Vegetation Classification (NVC). This information was developed into a preliminary, floristic classification of vegetation at the alliance and association level. The initial inventory suggested that about 100 associations existed in the mapping area. With this preliminary classification, sampling was initiated to capture representative samples of the different vegetation associations.

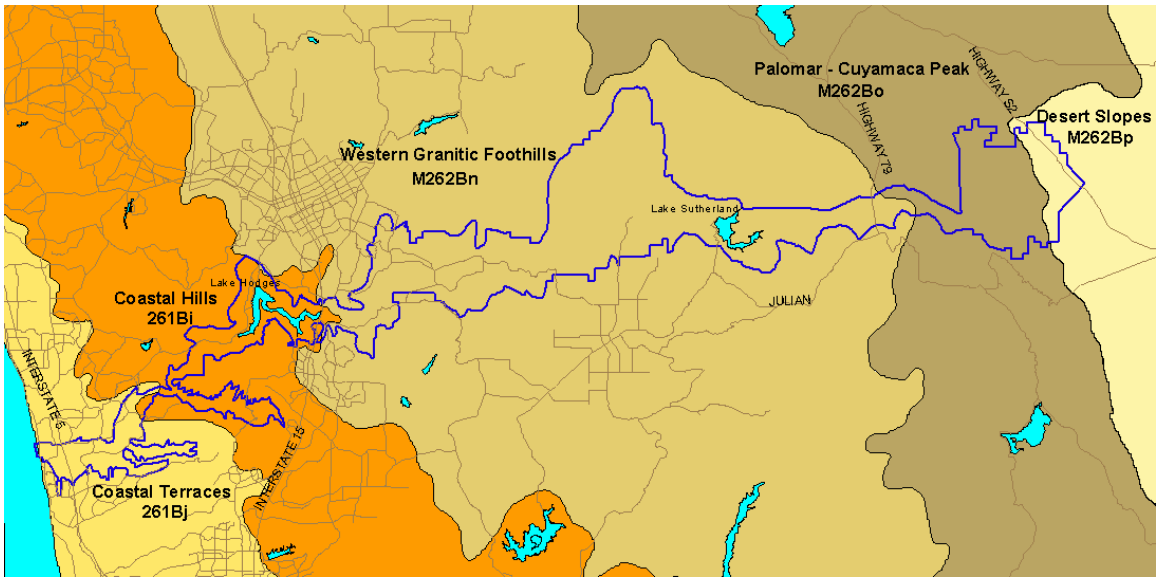
Sampling

Since the San Dieguito River Park is owned and managed by a variety of state, federal, and private entities, selection of sample sites was initiated through contacting public agencies for right of entry upon lands. Successful contacts were made with the CDFG, City and County of San Diego, Environmental Trust, San Dieguito River Park Joint Powers of Authority (SDRP-JPA), The Nature Conservancy (TNC), and U.S. Forest Service. The general areas of access included (from west to east) the San Dieguito Lagoon, Lusardi Creek drainage, Lake Hodges, San Diego Wild Animal Park, Boden Canyon, Pamo Canyon, Lake Sutherland, Santa Ysabel Creek properties, Volcan Mountain, and San Felipe Valley.

Staff members from CNPS (Chris Clifford, Julie Evens, Anne Klein, and Jeanne Taylor) coordinated the majority of field sampling. The staff also trained local CNPS San Diego Chapter members to assist in the sampling, which included over 15 different volunteers (including

Figure 1. Study area including the San Dieguito River Park boundary within the ecological subsections color map and within the County inset map. In the color map, the boundary of the River Park is illustrated with a dark blue line, and major roads are the light tan lines. The colored backdrop shows the U.S. Forest Service ecological subsections of the Southern California Coast (Miles and Goudey 1997).





Cindy Burrascano, Rick Fisher, Robert MacAller, Kim Marsden, Bertha McKinley, and Marshall Woodgate). CDFG staff (including Kane Davis, Diana Hickson, Todd Keeler-Wolf, Kari Lewis, Teresa LeBlanc, Brad Henderson, Kim McKee, John Ekhoff, Meredith Osborne, and Terri Stewart) assisted in sampling on six separate occasions. On contract through CDFG, University of California (UC) staff (Kirsten Larsen, Joanna Lemly, and Justin West), Jones and Stokes staff (including Kurt Campbell and Nancy Cione) and San Diego State University (SDSU) staff (Patrick McConnell) assisted on separate occasions.

In a period from June 2001 to June 2003, CNPS and UC staff opportunistically targeted and timed sampling expeditions across the study area, since most of the land access to these public or quasi-public lands was available intermittently upon permission during the study period. More recently from January to May of 2005, the CDFG, SDSU, and Jones and Stokes staff specifically targeted sampling expeditions within the CDFG San Felipe Wildlife Area, which is partially within and immediately adjacent to the study area of this project. The recent data have informed some of the descriptions for the vegetation summarized in this report.

The CNPS Vegetation Rapid Assessment protocol was used to collect vegetation data, and these data were used to classify and describe the vegetation (see Appendix 1 for the field form and protocol description). The rapid assessment protocol is a methodology for recording salient vegetation and environmental features for an entire "stand" or "polygon" of vegetation, whereby survey information is recorded for homogeneous stands of vegetation. The stands are identified by subjectively locating areas of homogeneous plant species composition, abundance and site history. The area for each assessment varied depending on the size of the stand and the accessibility of the stand. Thus, an assessment could be <1 acre or > 5 acres in size. Further, this technique allows stands to be assessed across a distance of up to 300 meters away through binoculars when the vegetation and environmental characteristics were obvious enough to assess. This was particularly useful in capturing vegetation on inaccessible private lands that were adjacent to public lands.

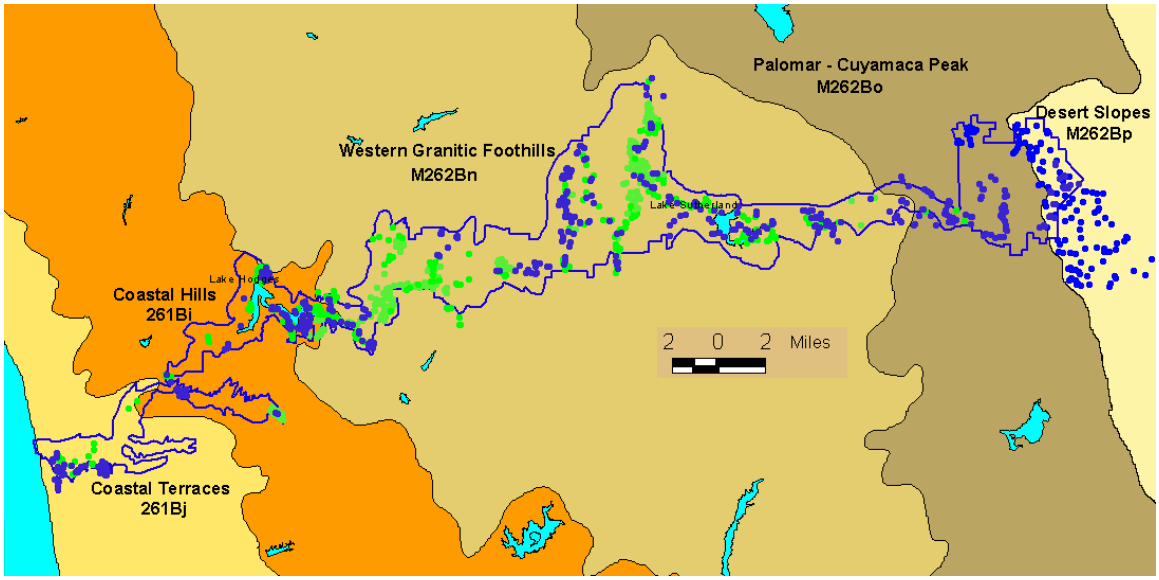
See Figure 2 for point locations for all the surveys used in describing the vegetation of the study area. For the sampling, an effort was made to collect representative assessments of every different plant community that was encountered (as based on the classification methods in Sawyer and Keeler-Wolf 1995). Aerial photographs were used to find repeated signatures of these plant communities in accessible lands, and rapid assessments were collected repeatedly for each vegetation type when observed in different areas. Further, a series of field reconnaissance points were also conducted to substantiate the vegetation diversity.

For each rapid assessment survey, a list of tree, shrub, and/or herb species was recorded for all the dominant and characteristic species in each stand identified and sampled (on average, each rapid assessment list contained 10 native species and an additional 3 non-native species). Plant species were identified using the Jepson Manual (Hickman 1993) and other related keys. Each species listed on the survey form was designated a height stratum (low=<0.5 m, medium=>0.5 to 5 m, and tall=>5 m), and the abundance or absolute percent cover value was assessed by estimating the percentage of ground area covered by living parts of each species. Species sometimes could be identified in more than one stratum, and cover was estimated for each stratum (e.g., cover of *Quercus agrifolia* may be recorded in the low, medium and/or tall layers). All percent cover estimates for species were transformed into ranked categories similar to the Braun-Blanquet (1932/1951) system for the data analysis (categories: 1=<1%, 2=1-5%, 3=>5-15%, 4=>15-25%, 5=>25-50%, 6=>50-75%, 7=>75%).

All survey locations were recorded in Universal Transverse Mercator (UTM) and North American datum 1983 using global positioning system (GPS) receivers. One GPS point was recorded within a representative location of each rapid assessment survey. 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. (See Appendix 1 for the field form and protocol of variables).

During the scope of the project, vegetation rapid assessment surveys were entered into an MS Access database developed by CNPS. The survey data are archived in separate tables titled RAPlots, RAPlants, and RAImpacts. An associated RAFPlots form displays the information collected for each survey. Other tables in the database are reference tables for the functionality of the forms and data tables. All the data were quality controlled in late 2003 and mid 2005.

Figure 2. Locations of the field surveys. The 579 vegetation rapid assessment survey locations are blue dots, and the 595 reconnaissance points are green dots. The backdrop is the U.S. Forest Service ecological subsections (Miles and Goudey 1997), and the thick blue border line is the San Dieguito River Park boundary.



Cluster analyses for vegetation classification

Rapid assessment data from the 2001-2003 sampling effort were analyzed in 2004, and data from the 2005 effort were analyzed in this year. A team of ecologists classified the data, including Julie Evens, Diana Hickson, Anne Klein, and Todd Keeler-Wolf. The analyses of sample data were 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 biological 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) and Cluster Analysis and Ordination (McCune and Mefford 1997).

Classification analyses were performed using agglomerative Cluster Analysis and TWINSPAN in a complementary approach to objectively classify the samples and to create order out of complex vegetation patterns in the data. The main groups were defined by similarities in species composition and abundance. Through this process, a classification of the different natural communities or vegetation types can be scientifically made, based mainly on floristic and secondarily on environmental factors. When different analyses show similar results, they substantiate each other, providing a consistent, strong analysis (Gauch 1982, Parker 1991).

In general, the classification followed a standard process. First, the classification included all sample-by-species information, which was subjected to two basic cluster analysis runs. The first was based on presence/absence of species with no additional cover data considered. This provided a general impression of the relationships between all the groups based solely on species membership. The second was based on abundance (cover) values converted into 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 first four cover classes compose the majority of the species values. This second run demonstrated the modifications that cover values can make on the group memberships.

Since plant community datasets are inherently heterogeneous and more than one underlying gradient usually determines the heterogeneity in plant patterns, a hierarchical agglomerative Cluster Analysis was employed (McCune and Grace 2002) with Sorenson distance and flexible beta linkage method at -0.25. A cluster analysis dendrogram is produced using this technique, whereby samples are grouped together into hierarchical clusters of groups (from many nested subgroups to 2 main groups). Upon reviewing the main groups of plots, the full dataset was broken up into smaller, more manageable datasets, and subsequent cluster analyses were produced for each of these smaller datasets. Depending on the size of the datasets, the runs were modified to show from 2 to 15 groups, with the intent to display the natural groupings at the generic level (the alliance) and the finest level of floristic classification (the association).

Prior to the individual cluster analysis runs, data records were screened for outliers (extreme values of sample units or species), and outliers subsequently 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 species that were indicators of the different groups. ISA produced indicator values for each species in each of 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 up to 20 groups (i.e., the maximum number of groups allowed in this dataset, 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 ≤0.05) 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 were applied within floristic classes to all samples of the different groups. Following each of these analyses, the consistent groupings were identified and compared between Cluster Analysis and TWINSPAN.

Cluster Analysis with Sorenson distance measure was compared to TWINSPAN using Euclidean distance measure (McCune and Mefford 1997), which provides a divisive view of grouping as opposed to the agglomerative grouping in Cluster Analysis.

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, pre-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 presence and abundance.
4. Break up the dataset into smaller, sizeable units for subsequent Cluster Analysis runs.
5. Run Indicator Species Analysis (ISA) at each of the successive group levels for each of the Cluster Analysis dendrograms from 2 groups up to the maximum number of groups (all groups have at least 2 samples).
6. Settle on the final representative grouping level of each Cluster Analysis to use in the preliminary labeling.
7. Preliminarily label alliance and association for each of the samples, and denote indicator species from the ISA.
8. Run TWINSPAN to test congruence with the subsetted TWINSPAN divisions, comparing the general arrangement of samples.
9. 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.
10. Re-label final alliance labels for each sample and arrange in table of database.
11. 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.

The sampling and analysis under-represented some rare vegetation types, which are based on rare edaphic environments within the study area. They were often the only representatives of rare alliances that are known from areas within the boundary of the study, or they were the only representatives of alliances that are more common in other areas of California. Additionally, it was not possible to survey the full spectrum of vegetation because the study area had mixed ownership and accessibility. For these reasons, adequate data may not be available in this report for all vegetation types. Nevertheless, relatively unique samples were considered important and described separately in the results. In some cases, they represented unusual species groupings heretofore undescribed and were viewed as affording perspective into unusual vegetation types that deserve additional sampling. They may be described generically as alliances, habitats, or unique stands.

Classification and Key

The classification and key were produced to substantiate the vegetation types identified in the fieldwork of this project. They are based on the standard floristic hierarchy of the U.S. National Vegetation Classification System (see NatureServe 2004 or <www.natureserve.org>). They are characterized by species composition, abundance, and habitat/environment.

Naming conventions follow 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, a Coast Live Oak Alliance is recognized by the characteristic presence and abundance of that oak species in the overstory, a pattern which occurs broadly in coastal California.

Associations are subdivisions of alliances based on constant patterns of additional species within an overall pattern of alliance dominance. An association is the most basic fundamental unit in floristic classification. 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. For example, there are various associations of coast live oak alliance, based on both characteristic overstory and understory species (e.g., Coast Live Oak with Poison Oak and Grass as compared to Coast Live Oak with California Sagebrush). Associations are typically more geographically specific than alliances. They tend to be locally distributed and indicative of a certain environment or ecosystem in a local setting. In the names of associations or alliances, the species of the uppermost stratum is listed first, and additional species in different strata are separated with slashes (*e.g. Quercus agrifolia/Toxicodendron diversilobum/*Grass), while additional species in the same stratum are separated with dashes (*e.g. Quercus agrifolia-Quercus engelmannii)*.

To differentiate types in the classification, a key to the alliances and associations is provided. It presents general choices and information on the physiognomy of vegetation and the different environments based on wetland/upland position. This approach was chosen for the following reasons: 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.

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 Julie Evens and Sau San (state CNPS staff). Todd Keeler-Wolf (state CDFG staff) and Cindy Burrascano (local CNPS member) reviewed and edited the descriptions. 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 for co-dominance or at least 60 percent for dominance.
2. **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. **Minimum sample size for classification and description**: n = 3. Descriptions of associations with fewer than three samples were attempted if (a) the association 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.
6. **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.

7. **Intermittent**: Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where there is 33-66 percent absolute cover.
8. **Continuous**: Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where there is greater than 66 percent absolute cover.
9. **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).
10. **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 sabiniana* 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.
11. **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.
12. **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.
13. **Tree:** Is normally a one-stemmed woody plant that normally grows to be greater than 5 meters tall.
14. **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 high ends of the height scales.
15. **Herbaceous plant:** Is any species of plant lacking main woody stem development, including grasses, forbs, and perennial species that die back seasonally.
16. **Forest:** Defined in the National Vegetation Classification as a tree-dominated stand of vegetation with 60 percent or greater cover of trees.
17. **Woodland:** Defined in the National Vegetation Classification as a tree-dominated stand of vegetation with 25 percent to 59 percent cover of trees.
18. **Sparsely wooded:** These 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).
19. **Rare and endangered plants:** Listed as per CNPS (2005) Online Inventory of Rare and Endangered Plants
20. **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 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

21. **Sample(s) used to describe alliance**: Listed by survey numbers from the Vegetation Rapid Assessment database, starting with "SDRP" or "SFVW" and ending in a sequential number.
22. **Freq, Avg, Min, Max:** A species table is provided at the end of each alliance description. The Freq column provides the overall frequency value for each species within all rapid assessments classified as that alliance. The frequency values are between 0 and 1, and species that occurred with at least 20% constancy (at least 0.2 freq) 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 when the species was recorded.

RESULTS

During the 2001-2003 sampling effort, CNPS staff and affiliated CDFG and contract staff conducted 453 vegetation rapid assessments across the study area. An additional 595 reconnaissance points also were taken by CNPS staff to validate the vegetation types for mapping. In a separate 2005 sampling effort, CDFG and affiliated contract staff conducted an additional 154 rapid assessments, of which 126 were used to update results of this CNPS effort.

In the vegetation rapid assessment surveys, 655 vascular plant taxa were identified, and generic names were given to vascular plant species that were not identified to the species level. Further, three general names were given to non-vascular taxa (i.e., cryptogamic crust, moss, and lichen). Appendix 2 provides a complete list of scientific and common names for all the taxa identified and analyzed in the rapid assessment surveys. The scientific names of the taxa were converted to alpha-numeric codes for the data analyses, as recorded in the appendix. Further, appendix 3 provides a list of 12 sensitive plants that were recorded in the study area (per CNPS 2005). State and federal listing status and generalized habitat information are provided.

The records of all taxa were reviewed before the analyses, and groups of taxa that were inconsistently identified to the species-level were subsumed into a generic name (e.g., *Erodium botrys, E. brachycarpum*, and *E. moschatum* were merged into *Erodium* for the analysis). Further, all hardwood and conifer tree species were separated into height strata for the analyses, and their codes were modified with endings in "-t" for tall (>5m height), "-m" for medium (>0.5m and <5m height), and "-l" for low (<0.5m height).

An initial cluster analysis were produced for the 453 surveys from the 2001-2003 effort, including data on 118 tree overstory, 294 shrub overstory, and 41 herbaceous stands. The initial full dataset was broken up into eight smaller groups of data for final cluster analysis runs after a first cluster analysis run was performed with species presence-absence values and a second run with species abundance values was performed. These eight groups were distinctly differentiated as main groups in the second cluster analysis run and in an initial Indicator Species Analysis.

Another cluster analysis was produced for 154 surveys from the 2005 effort in the adjacent San Felipe Wildlife Area, including data on 18 tree overstory, 87 shrub overstory, 21 herbaceous stands, and 28 other desert stands not included in the study area or the report. Thus, this dataset provided a ninth group for the analysis with 126 surveys used to augment the report.

The main groups are summarized as follows: 1) 53 plots with indicator species such as *Artemisia californica, Eriogonum fasciculatum, Centaurea melitensis*, and *Hirschfeldia incana (*ARCA11, ERFA2, CEME2, HIIN3); 2) 61 plots with indicators such as *Rhus integrifolia, Malosma laurina, Opuntia littoralis,* and *Encelia californica* (RHIN2, MALA6, OPLI3, ENCA*);* 3) 73 plots with indicators such as *Xylococcus bicolor, Salvia mellifera*, and *Adenostoma fasciculatum* (XYBI, SAME3, ADFA); 4) 76 plots with indicators such as *Quercus berberidifolia, Salvia apiana, Yucca whipplei,* and *Arctostaphylos glandulosa* (QUBE5, SAAP2, YUWH, ARGL4); 5) 44 plots with indicators such as Tamarix, Baccharis salicifolia, and Salix gooddingii (TAMAR2, BASA4, SAGO-t); 6) 59 plots with indicators such as *Platanus racemosa, Quercus chrysolepis, Symphoricarpos mollis,* and *Salix laevigata* (PLRA-t, QUCH2-t, SYMO, SALA3-t); 7) 47 plots with indicators such as *Quercus agrifolia, Q. engelmannii, Bromus diandrus, and Toxicodendron diversilobum* (QUAG-t, QUEN-t, BRDI3, TODI); 8) 41 plots with indicators such as *Erodium, Eremocarpus setigerus,* and *Nassella pulchra* (ERODI, ERSE3, NAPU4); and 9) 154 plots with main species such as *Acacia greggii, Chilopsis linearis, Quercus wislizeni,* and *Rhus ovata* (ACGR, CHLI, QUWI, RHOV). See Figure 3 for an example dendrogram from the 47 plots of the seventh group.

Figure 3. Example of the cluster analysis of showing the arrangement and relationship of surveys in the clustering diagram and their final association names. Each colored group indicates the different alliances.

Final class	Sample ID	Diagram (splits closest to left are ecologically more closely related than splits to right)
Bromus diandrus-Mixed Herb	SDRP0007	
Bromus diandrus-Mixed Herb	SDRP0184	
Bromus diandrus-Mixed Herb	SDRP0068	
Bromus diandrus-Mixed Herb	SDRP0205	
Bromus diandrus-Mixed Herb	SDRP0226	
Quercus engelmannii/grass-herb	SDRP0020	
Quercus engelmannii/grass-herb	SDRP0042	
Quercus kelloggii/grass-herb	SDRP0177	
Pinus coulteri-Quercus kelloggii	SDRP0185	
Pinus coulteri-Quercus kelloggii	SDRP0186	
Quercus agrifolia/grass-herb	SDRP0408	
Quercus agrifolia/grass-herb	SDRP0484	
Bromus diandrus-Mixed Herb	SDRP0483	
Quercus engelmannii-Q. agrifolia/Toxicodendron diversilobum/grass-herb	SDRP0416	
Quercus engelmannii-Q. agrifolia/Toxicodendron diversilobum/grass-herb	SDRP0418	
Quercus agrifolia-Q. engelmannii/Eriogonum fasciculatum/grass-herb	SDRP0436	
Quercus engelmannii-Q. agrifolia/Toxicodendron diversilobum/grass-herb	SDRP0474	
Quercus engelmannii/Salvia apiana/Grass-herb	SDRP0024	
Quercus agrifolia-Q. kelloggii (Peninsular Range)	SDRP0026	
Quercus agrifolia-Q. kelloggii (Peninsular Range)	SDRP0028	
Quercus agrifolia-Q. kelloggii (Peninsular Range)	SDRP0222	
Quercus agrifolia-Q. kelloggii (Peninsular Range)	SDRP0183	
Quercus agrifolia-Q. kelloggii (Peninsular Range)	SDRP0187	
Pseudotsuga macrocarpa-Quercus agrifolia	SDRP0213	
Quercus berberidifolia	SDRP0171	
Quercus engelmannii/Salvia apiana/Grass-herb	SDRP0182	
Quercus engelmannii/Salvia apiana/Grass-herb	SDRP0175	
Quercus engelmannii/Salvia apiana/Grass-herb	SDRP0351	
Quercus agrifolia/Toxicodendron diversilobum Riparian	SDRP0052	
Quercus agrifolia/Toxicodendron diversilobum Riparian	SDRP0134	
Quercus engelmannii-Q. agrifolia/Toxicodendron diversilobum/grass-herb	SDRP0478	
Quercus engelmannii-Q. agrifolia/Toxicodendron diversilobum/grass-herb	SDRP0476	
Quercus agrifolia/Toxicodendron diversilobum/Grass	SDRP0069	
Quercus agrifolia/Toxicodendron diversilobum Riparian	SDRP0071	
Quercus agrifolia/Toxicodendron diversilobum/Grass	SDRP0486	
Quercus agrifolia-Platanus racemosa/Toxicodendron diversilobum	SDRP0292	
Quercus agrifolia/Toxicodendron diversilobum/Grass	SDRP0352	
Quercus agrifolia/Toxicodendron diversilobum/Grass	SDRP0445	
Quercus engelmannii-Q. agrifolia/Chaparral	SDRP0153	
Quercus engelmannii-Q. agrifolia/Chaparral	SDRP0447	
Quercus engelmannii-Q. agrifolia/Artemisia californica	SDRP0168	
Artemisia californica-Salvia apiana	SDRP0471	
Quercus engelmannii/Salvia apiana/Grass-herb	SDRP0313	
Quercus engelmannii-Q. agrifolia/Chaparral	SDRP0298	
Quercus berberidifolia	SDRP0155	
Quercus engelmannii-Q. agrifolia/Chaparral	SDRP0444	
Quercus engelmannii-Q. agrifolia/Chaparral	SDRP0461	

Outlier analysis was performed on each of the datasets before the surveys were classified. In this analysis, four outlier surveys removed from the datasets, which were widely divergent from the rest of the surveys. Further, species that occurred in less than three surveys were removed from each of the nine datasets, with a range of 62 to 154 species removed per each dataset.

With the nine final cluster analyses and dendrograms produced, survey data were classified to the alliance level (and association level if possible). All vegetation types were defined as finely as possible based on the number of replicate samples, the existing information for each of the types prior to the analyses, and the similarity in classification between different analysis techniques. For example, congruence of groupings between TWINSPAN and Cluster Analysis was generally close. Disparities were resolved by reviewing the species composition of individual samples. Most of these uncertain samples either represented transitional forms of vegetation that could be thought of as borderline misclassified samples, or samples with no other similar samples in the data set. Thus, every plot was reviewed individually in the classification.

CLASSIFICATION

The final cluster analyses and Indicator Species Analyses substantiated 85 alliances, 2 unique stands, and 1 habitat type, and review of reconnaissance data identified one additional herbaceous alliance. These represent 17 tree-dominated, 57 shrub-dominated, and 14 herbaceous-dominated types. Further, the analyses substantiated 102 associations, and reconnaissance data confirmed one additional tree association. Table 1 provides a list of this floristically-based classification. While some alliances may have little data available for the 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,
3) so future projects can benefit from the definitions of alliances in this project, especially since few data in San Diego have been collected and analyzed.

By providing as much information as possible in the floristic classification, key, and descriptions, it is hoped that future research and management efforts will build upon this framework of vegetation classification in the San Dieguito River Park region. While this project has attempted to describe all the vegetation types in the study area, it is possible that additional alliance and association characteristics could come out through further research, especially with access to other private lands and additional sampling on public lands. For example, more detail could be provided in the herbaceous-dominated alliances because this project focused more heavily on the woody vegetation types, which were more readily sampled using the rapid assessment method and more readily mapped using the digital photo head's up digitizing approach. Further, more research in the region could assist in additionally defining the current list alliances and associations.

Other floristically based vegetation types were listed in recent studies within the San Dieguito River Park, including the areas of Santa Ysabel Ranch and Volcan Mountain (cf. Moran 2004 and Sproul 2001). Because there are no quantitative field data (or statistical analyses) to confirm them, these additional plant communities are not included in Table 1 nor included in the key and descriptions below. Alternatively, Table 2 provides a list of additional alliances or associations documented in these recent studies (without including the general habitat types that were also mentioned in these studies). Additional quantitative survey efforts could further substantiate these types listed.

Table 1. Final classification of vegetation alliances and associations from the San Dieguito River Park area, California, nested within the formation-level hierarchy per the National Vegetation Classification System (NVCS). Classification is associated also with ecological subsection identifiers, mapping classification with codes, and number of rapid assessment surveys (per alliance). Alliances (highlighted in gray) that currently exist in the NVCS were categorized to formations per NatureServe (2005); types not currently defined in the NVCS were designated to formations by conservatively relating them to similar types.

Formation Code/Name	In NVCS 2005	Alliance	Association	Ecological Subsection	Map Code	n - surveys
Tree Overstory Vegetation						
I.A.6.N.b.	**Lowland or submontane winter-rain evergreen sclerophyllous forest**					
	yes	*Eucalyptus* spp.			1130	3
			Alliance only	Coastal Hills		
	yes	*Quercus chrysolepis*			1122	2
			Quercus chrysolepis	Palomar - Cuyamaca Peak	1133	
			Quercus chrysolepis- Pseudotsuga macrocarpa	Palomar - Cuyamaca Peak	1131	
I.A.8.N.b.	**Rounded-crowned temperate or subpolar needle-leaved evergreen forest**					
	no	*Abies concolor-Calocedrus decurrens*			2230	5
			Abies concolor-Calocedrus decurrens-Pseudotsuga macrocarpa-Pinus coulteri	Palomar - Cuyamaca Peak	2231	
	yes	*Calocedrus decurrens*			2101	2
			Calocedrus decurrens-Quercus chrysolepis-Quercus kelloggii	Palomar - Cuyamaca Peak	2170	
I.A.8.N.c.	**Conical-crowned temperate or subpolar needle-leaved evergreen forest**					
	yes	*Pseudotsuga macrocarpa*			2221	3
			Pseudotsuga macrocarpa-Quercus agrifolia	Palomar - Cuyamaca Peak	2241	
			Pseudotsuga macrocarpa-Quercus chrysolepis	Palomar - Cuyamaca Peak	2240	
I.B.2.N.b.	**Montane or boreal cold-deciduous forest**					
	yes	*Quercus kelloggii*			3102	7
			Quercus kelloggii/Annual grass-herb	Palomar - Cuyamaca Peak	3146	
			Quercus kelloggii-Calocedrus decurrens	Palomar - Cuyamaca Peak	3140	
			Quercus kelloggii-Quercus chrysolepis	Palomar - Cuyamaca Peak	3135	
I.B.2.N.d.	**Temporarily flooded cold-deciduous forest**					
	yes	*Alnus rhombifolia*			3220	3
			Alnus rhombifolia-Platanus racemosa-Quercus chrysolepis	Palomar - Cuyamaca Peak	3233	
II.A.4.N.a.	**Rounded-crowned temperate or subpolar needle-leaved evergreen woodland**					
	yes	*Pinus coulteri*			2121	5
			Pinus coulteri-Quercus kelloggii	Palomar - Cuyamaca Peak	2131	
	yes	*Pinus coulteri-Quercus chrysolepis*			2132	1
			Alliance only	Palomar - Cuyamaca Peak		
	no	*Pinus torreyana*			2122	3
			Pinus torreyana/Artemisia californica-Rhus integrifolia	Coastal Terraces	2180	
II.A.5.N.a.	**Sclerophyllous extremely xeromorphic evergreen woodland**					
	yes	*Quercus agrifolia*			1201	33
			Quercus agrifolia/Annual grass-herb	Coastal Hills, Western Granitic Foothills	1243	
			Quercus agrifolia/Coastal Sage Scrub	Coastal Hills, Western Granitic Foothills	1240	

Formation Code/Name	In NVCS 2005	Alliance	Association	Ecological Subsection	Map Code	n - surveys
			Quercus agrifolia/Toxicodendron diversilobum Riparian	Western Granitic Foothills	1238	
			Quercus agrifolia/Toxicodendron diversilobum/Grass	Western Granitic Foothills	1242	
			Quercus agrifolia-Platanus racemosa/Toxicodendron diversilobum	Coastal Hills, Western Granitic Foothills, Palomar - Cuyamaca Peak	1231	
			Quercus agrifolia-Quercus engelmannii/Eriogonum fasciculatum/Annual grass-herb	Western Granitic Foothills, Palomar - Cuyamaca Peak, Desert Slopes	1241	
			Quercus agrifolia-Quercus kelloggii (Peninsular Range)	Western Granitic Foothills, Palomar - Cuyamaca Peak	1244	
	no	*Quercus engelmannii*			3101	31
			Quercus engelmannii/Adenostoma fasciculatum-Arctostaphylos glauca	Western Granitic Foothills	3137	
			Quercus engelmannii/Annual grass-herb	Western Granitic Foothills, Palomar - Cuyamaca Peak	3134	
			Quercus engelmannii/Quercus berberidifolia	Palomar - Cuyamaca Peak, Desert Slopes	3132	
			Quercus engelmannii/Salvia apiana/Grass-herb	Western Granitic Foothills, Palomar - Cuyamaca Peak	3133	
			Quercus engelmannii-Quercus agrifolia/Artemisia californica	Western Granitic Foothills	3138	
			Quercus engelmannii-Quercus agrifolia/Chaparral	Western Granitic Foothills, Palomar - Cuyamaca Peak	3145	
			Quercus engelmannii-Quercus agrifolia/Toxicodendron diversilobum/Annual grass-herb	Western Granitic Foothills	3143	
II.B.2.N.b.	**Temporarily flooded cold-deciduous woodland**					
	yes	*Platanus racemosa*			3221	6
			Platanus racemosa/Annual Grass-Herb	Western Granitic Foothills, Desert Slopes, Palomar - Cuyamaca Peak		
	no	*Platanus racemosa-Populus fremontii*			3232	7
			Alliance only	Desert Slopes		
			Platanus racemosa-Populus fremontii/Salix lasiolepis	Western Granitic Foothills	3249	
	yes	*Populus fremontii*			3222	10
			Alliance only	Coastal Hills		
			Populus fremontii/Baccharis salicifolia	Desert Slopes	3241	
			Populus fremontii/Prosopis glandulosa	Desert Slopes	3242	
			Populus fremontii-Salix gooddingii/Baccharis salicifolia	Western Granitic Foothills, Desert Slopes	3252	
			Populus fremontii-Salix laevigata	Desert Slopes	3236	
	yes	*Salix gooddingii*			3203	10
			Salix gooddingii/Baccharis salicifolia	Coastal Hills, Western Granitic Foothills, Desert Slopes	3237	
			Salix gooddingii/Lepidium latifolium	Coastal Hills, Western Granitic Foothills	3246	
			Salix gooddingii-Salix laevigata	Western Granitic Foothills	3238	
	yes	*Salix laevigata*			3202	5
			Salix laevigata/Salix lasiolepis/Artemisia douglasiana	Western Granitic Foothills	3239	

Formation Code/Name	In NVCS 2005	Alliance	Association	Ecological Subsection	Map Code	n - surveys
Shrub Overstory Vegetation						
III.A.2.N.c. Sclerophyllous temperate broad-leaved evergreen shrubland						
	yes	*Adenostoma fasciculatum*			4301	11
			Adenostoma fasciculatum (disturbance)	Desert Slopes	4345	
			Adenostoma fasciculatum (pure)	Western Granitic Foothills, Palomar - Cuyamaca Peak, Desert Slopes	4330	
	no	*Adenostoma fasciculatum-Arctostaphylos glandulosa*			4302	4
			Adenostoma fasciculatum-Arctostaphylos glandulosa-Quercus berberidifolia	Western Granitic Foothills, Palomar - Cuyamaca Peak	4386	
	no	*Adenostoma fasciculatum-Arctostaphylos glauca*			4328	10
			Adenostoma fasciculatum-Arctostaphylos glauca	Western Granitic Foothills	4360	
			Adenostoma fasciculatum-Arctostaphylos glauca-Quercus berberidifolia	Western Granitic Foothills	4495	
	no	*Adenostoma fasciculatum-Ceanothus greggii*			4314	7
			Adenostoma fasciculatum-Ceanothus greggii	Western Granitic Foothills, Desert Slopes	4314	
	no	*Adenostoma fasciculatum-Salvia apiana*			4304	11
			Adenostoma fasciculatum-Salvia apiana-Artemisia californica	Western Granitic Foothills	4370	
	no	*Adenostoma fasciculatum-Xylococcus bicolor*			4338	76
			Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus crassifolius-Malosma laurina-Rhus ovata	Western Granitic Foothills	4377	
			Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus verrucosus	Coastal Hills, Coastal Terraces, Western Granitic Foothills	4337	
			Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum	Coastal Hills, Western Granitic Foothills	4395	
			Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum-Eriogonum fasciculatum	Coastal Terraces, Western Granitic Foothills	4394	
			Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum-Salvia mellifera-Rhus integrifolia	Coastal Hills, Coastal Terraces	4393	
			Adenostoma fasciculatum-Xylococcus bicolor-Salvia mellifera-Malosma laurina	Coastal Hills, Western Granitic Foothills	4443	
	yes	*Arctostaphylos glandulosa*			4305	1
			Arctostaphylos glandulosa	Palomar - Cuyamaca Peak		
	yes	*Arctostaphylos glauca*			4329	2
			Arctostaphylos glauca	Western Granitic Foothills		
	no	*Arctostaphylos pringlei*			4306	2
			Alliance only	Western Granitic Foothills, Palomar - Cuyamaca Peak		
	yes	*Ceanothus crassifolius*			4310	6
			Ceanothus crassifolius	Western Granitic Foothills		
			Ceanothus crassifolius-Adenostoma fasciculatum-Xylococcus bicolor	Western Granitic Foothills	4463	
	yes	*Ceanothus leucodermis*			4313	3
			Alliance only	Palomar - Cuyamaca Peak		
			Ceanothus leucodermis	Western Granitic Foothills		
	yes	*Ceanothus oliganthus*			4311	4

Formation Code/Name	In NVCS 2005	Alliance	Association	Ecological Subsection	Map Code	n - surveys
			Alliance only	Palomar - Cuyamaca Peak		
			Ceanothus oliganthus-Adenostoma fasciculatum-Xylococcus bicolor	Western Granitic Foothills	4396	
	no	*Ceanothus verrucosus*			4312	4
			Ceanothus verrucosus-Xylococcus bicolor	Coastal Hills	4397	
	no	*Cercocarpus minutiflorus*			4326	1
			Alliance only	Coastal Terraces		
	no	*Dendromecon rigida*			4406	3
			Dendromecon rigida	Desert Slopes		
	yes	*Malosma laurina*			4317	11
			Malosma laurina-Eriogonum fasciculatum	Western Granitic Foothills	4384	
			Malosma laurina-Eriogonum fasciculatum-Salvia mellifera	Coastal Hills	4351	
	yes	*Prunus ilicifolia*			4316	2
			Prunus ilicifolia-Heteromeles arbutifolia	Western Granitic Foothills	4465	
	yes	*Quercus berberidifolia*			4321	9
			Quercus berberidifolia	Western Granitic Foothills, Palomar - Cuyamaca Peak	4359	
			Quercus berberidifolia-Adenostoma fasciculatum-Arctostaphylos glandulosa	Western Granitic Foothills, Palomar - Cuyamaca Peak	4366	
	no	*Quercus berberidifolia-Adenostoma fasciculatum*			4322	4
			Quercus berberidifolia-Adenostoma fasciculatum	Western Granitic Foothills, Palomar - Cuyamaca Peak		
	yes	*Quercus cornelius-mulleri*			4410	7
			Alliance only	Palomar - Cuyamaca Peak		
			Quercus cornelius-mulleri-Eriogonum fasciculatum-Ericameria linearifolia	Desert Slopes	4432	
			Quercus cornelius-mulleri-Rhus ovata	Desert Slopes	4433	
	no	*Quercus wislizenii-Ceanothus leucodermis*			4409	3
			Alliance only	Palomar - Cuyamaca Peak		
	no	*Quercus wislizeni-Quercus berberidifolia*			4323	1
			Quercus wislizeni-Quercus berberidifolia	Palomar - Cuyamaca Peak		
	no	*Rhamnus tomentella*			4325	1
			Alliance only	Palomar - Cuyamaca Peak		
	no	*Rhus integrifolia*			4319	16
			Rhus integrifolia-Adenostoma fasciculatum-Artemisia californica	Coastal Hills, Coastal Terraces	4356	
			Rhus integrifolia-Salvia mellifera-Artemisia californica	Coastal Hills, Coastal Terraces	4357	
	no	*Rhus ovata*			4320	4
			Rhus ovata-Ziziphus parryi	Desert Slopes	4437	
III.A.4.N.a.	**Lowland microphyllous evergreen shrubland (and drought deciduous shrubland – formation needs redefining)**					
	yes	*Artemisia californica*			5401	11
			Artemisia californica	Coastal Hills, Coastal Terraces, Western Granitic Foothills	8313	
			Artemisia californica-Malosma laurina	Coastal Hills, Western Granitic Foothills	5456	
	yes	*Artemisia californica-Eriogonum fasciculatum*			5402	12
			Artemisia californica-Eriogonum fasciculatum	Coastal Hills, Western Granitic Foothills	5457	

Formation Code/Name	In NVCS 2005	Alliance	Association	Ecological Subsection	Map Code	n - surveys
			Artemisia californica-Eriogonum fasciculatum-Malosma laurina	Coastal Hills	5454	
			Artemisia californica-Eriogonum fasciculatum-Malosma laurina	Western Granitic Foothills	5454	
	no	*Artemisia californica-Salvia apiana*			5432	6
			Artemisia californica-Salvia apiana	Coastal Hills, Western Granitic Foothills		
	yes	*Artemisia californica-Salvia mellifera*			5403	6
			Artemisia californica-Salvia mellifera-Baccharis sarothroides	Coastal Hills, Coastal Terraces	5467	
	yes	*Baccharis pilularis*			4502	1
			Alliance only	Coastal Hills		
	yes	*Encelia californica*			5406	3
			Encelia californica-Artemisia californica	Coastal Hills	5438	
			Encelia californica-Artemisia californica-Salvia mellifera-Baccharis pilularis	Coastal Terraces	5462	
	no	*Isocoma menziesii*			5440	3
			Isocoma menziesii	Coastal Terraces, Western Granitic Foothills		
	no	*Keckiella antirrhinoides*			5430	9
			Keckiella antirrhinoides-Artemisia californica	Coastal Hills, Western Granitic Foothills	5431	
			Keckiella antirrhinoides-Mixed chaparral	Western Granitic Foothills	5464	
	no	*Lotus scoparius*			5416	9
			Lotus scoparius	Coastal Terraces, Western Granitic Foothills, Palomar - Cuyamaca Peak, Desert Slopes		
	yes	*Salvia apiana*			5408	3
			Salvia apiana-Yucca whipplei	Western Granitic Foothills, Palomar - Cuyamaca Peak		
	yes	*Salvia mellifera*			5409	5
			Salvia mellifera	Coastal Hills, Western Granitic Foothills		
III.A.4.N.c.	**Temporarily flooded microphyllous shrubland**					
	yes	*Tamarix* spp.			4930	1
			Alliance only	Coastal Hills		
III.A.5.N.b.	**Facultatively deciduous extremely xeromorphic subdesert shrubland**					
	yes	*Eriogonum fasciculatum*			5404	11
			Eriogonum fasciculatum	Coastal Hills, Western Granitic Foothills, Desert Slopes	5451	
			Eriogonum fasciculatum-Rhus ovata	Western Granitic Foothills, Desert Slopes	5450	
	yes	*Eriogonum fasciculatum-Salvia apiana*			5407	6
			Alliance only	Desert Slopes		
			Eriogonum fasciculatum-Salvia apiana	Western Granitic Foothills		
III.A.5.N.c.	**Succulent extremely xeromorphic evergreen shrubland**					
	yes	*Opuntia littoralis*			4702	3
			Opuntia littoralis-Eriogonum fasciculatum-Malosma laurina	Coastal Hills, Western Granitic Foothills	4730	
			Opuntia littoralis-Mixed Coastal Sage Scrub	Coastal Hills	4730	
III.B.2.N.a.	**Temperate cold-deciduous shrubland**					
	yes	*Ceanothus integerrimus*			5101	1
			Alliance only	Palomar - Cuyamaca Peak		

Formation Code/Name	In NVCS 2005	Alliance	Association	Ecological Subsection	Map Code	n - surveys
	yes	*Prunus virginiana*			5102	1
			Alliance only	Palomar - Cuyamaca Peak		
	yes	*Rhus trilobata*			5103	1
			Alliance only	Palomar - Cuyamaca Peak		
III.B.2.N.c.	**Intermittently flooded cold-deciduous shrubland**					
	yes	*Baccharis salicifolia*			4901	8
			Baccharis salicifolia	Coastal Hills, Western Granitic Foothills		
	no	*Rosa californica*			5202	1
			Alliance only	Palomar - Cuyamaca Peak		
	no	*Sambucus mexicana*			4902	1
			Alliance only	Coastal Hills		
III.B.2.N.d	**Temporarily flooded cold-deciduous shrubland**					
	yes	*Salix exigua*			5201	1
			Alliance only	Desert Slopes		
	yes	*Salix lasiolepis*			3204	5
			Alliance only	Palomar-Cuyamaca Peak	3204	
			Salix lasiolepis/Baccharis salicifolia	Coastal Hills, Coastal Terraces, Western Granitic Foothills	3205	
III.B.3.N.a.	**Extremely xeromorphic deciduous subdesert shrubland without succulents**					
	yes	*Acacia greggii*			5601	23
			Acacia greggii/Annual Grass-Herb	Desert Slopes	5611	
	yes	*Prosopis glandulosa*			5603	13
			Prosopis glandulosa-Rhus ovata (Upper desert mesquite spring)	Desert Slopes	5631	
	no	*Prunus fremontii*			5501	6
			Prunus fremontii	Desert Slopes		
	yes	*Viguiera parishii*			5610	6
			Viguiera parishii-Agave deserti	Desert Slopes	5632	
			Viguiera parishii-Eriogonum fasciculatum	Desert Slopes	5633	
III.B.3.N.b.	**Intermittently flooded extremely xeromorphic deciduous subdesert shrubland**					
	yes	*Chilopsis linearis*			5602	5
			Chilopsis linearis	Desert Slopes		
III.C.2.N.a.	**Mixed evergreen - cold-deciduous shrubland**					
	yes	*Toxicodendron diversilobum*			5104	2
			Toxicodendron diversilobum/Pteridium aquilinum	Palomar - Cuyamaca Peak	5131	
IV.A.2.N.a.	**Extremely xeromorphic evergreen subdesert dwarf-shrubland**					
	no	*Eriogonum wrightii*			5701	4
			Eriogonum wrightii-Lessingia filaginifolia	Palomar - Cuyamaca Peak	5731	
IV.B.2.N.a.	**Cespitose cold-deciduous dwarf-shrubland**					
	yes	*Gutierrezia sarothrae*			5702	3
			Gutierrezia sarothrae-Erodium sp.-*Nassella pulchra*	Western Granitic Foothills, Palomar - Cuyamaca Peak	5730	
V.B.2.N.b.	**Creeping or matted cold-deciduous dwarf-shrubland**					
	yes	*Mesembryanthemum* spp. - *Carpobrotus* spp.			6801	1
			Carpobrotus chilensis-Artemisia californica	Coastal Terraces	6830	
Herbaceous Vegetation						
V.A.5.N.f.	**Short bunch temperate or subpolar grassland**					
	no	*Aristida purpurea*			6101	4

Formation Code/Name	In NVCS 2005	Alliance	Association	Ecological Subsection	Map Code	n - surveys
			Aristida purpurea	Palomar - Cuyamaca Peak, Desert Slopes		
V.A.5.N.d.	**Medium-tall bunch temperate or subpolar grassland**					
	yes	*Nassella pulchra*			6104	4
			Nassella pulchra-Erodium sp.*-Avena barbata*	Coastal Hills, Western Granitic Foothills		
V.A.5.N.j.	**Temporarily flooded temperate or subpolar grassland**					
	yes	*Arundo donax*			6301	1
			Alliance only	Western Granitic Foothills		
V.A.5.N.k.	**Seasonally flooded temperate or subpolar grassland**					
	no	Disturbed Temporarily to Seasonally Flooded Grasslands & Forbs			6302	2
			Alliance only	Coastal Hills		
	no	*Juncus balticus-Juncus mexicanus*			6204	4
			Juncus mexicanus	Western Granitic Foothills, Palomar - Cuyamaca Peak	6234	
	yes	*Juncus effusus*			6203	1
			Alliance only	Palomar - Cuyamaca Peak		
	yes	*Typha* spp.			6403	3
			Typha latifolia	Western Granitic Foothills	6430	
V.A.5.N.l.	**Semipermanently flooded temperate or subpolar grassland**					
	no	*Scirpus californicus - Scirpus acutus*			6401	2
			Scirpus (californicus and/or *acutus)-Typha*	Palomar - Cuyamaca Peak	6402	
			Scirpus californicus-Scirpus acutus	Coastal Hills	6401	
V.B.2.N.b.	**Low temperate or subpolar perennial forb vegetation**					
	no	*Selaginella bigelovii*			6702	1
			Selaginella bigelovii-Eriogonum fasciculatum	Western Granitic Foothills		
V.B.2.N.g.	**Tidal temperate perennial forb vegetation**					
	no	*Salicornia subterminalis*			6532	2
			Alliance only	Coastal Terraces		
	yes	*Salicornia virginica*			6501	5
			Salicornia virginica-Salicornia subterminalis	Coastal Terraces	6533	
V.B.2.N.h.	**Seasonally flooded temperate perennial forb vegetation**					
	no	*Anemopsis californica*			6208	6
			Anemopsis californica-Juncus mexicanus	Western Granitic Foothills, Desert Slopes	6233	
	no	*Lepidium latifolium*			6303	0
			Alliance only	Western Granitic Foothills		
V.D.2.N.d.	**Short temperate annual grassland**					
	yes	California Annual Grassland			7100	32
			Bromus diandrus-Mixed Herb	Western Granitic Foothills, Palomar - Cuyamaca Peak	7131	
			Bromus madritensis-Mixed Herb	Desert Slopes, Coastal Hills, Western Granitic Foothills	7130	
			Bromus tectorum	Desert Slopes, Palomar - Cuyamaca Peak	7103	
V.D.2.N.h.	**Seasonally flooded temperate annual forb vegetation**					
	no	*Ambrosia psilostachya*			6207	2
			Ambrosia psilostachya-Grindelia hirsutula var. *hallii*	Palomar - Cuyamaca Peak	6240	

Table 2. Additional plant communities listed in reports by Sproul (2001) and Moran (2004).

Vegetation Alliance or Association Name
Shrub Overstory Vegetation
Cercocarpus betuloides (Birch-leaf Mountain Mahogany)
Gutierrezia sarothrae-Eriogonum fasciculatum var. *polifolium and* var. *fasciculatum* (Matchweed-California Buckwheat)
Gutierrezia sarothrae-Eriogonum wrightii membranaceum (Matchweed-Wright's Buckwheat)
Gutierrezia sarothrae/Aristida purpurea longiseta (Matchweed/Three Awn)
Quercus wislizeni (Interior Live Oak)
Ailanthus altissima (Tree-of-Heaven)
Herbaceous Vegetation
Achnatherum coronatum (Giant Stipa)
Carex spp. (including *Carex praegracilis* and *C. fracta)* (Sedge Meadow)
Elymus elymoides (Squirreltail)
Elymus glaucus (Blue Wild Rye)
Koeleria macrantha-Poa secunda (Junegrass/One-sided Bluegrass)
Lemna minuscula (Pondweed)
Melica imperfecta (Melica grassland)
*Muhlenbergia rigens (*Deergrass)
Nassella cernua (Needlegrass)
Nassella-Wildflower *(*Needlegrass/Wildflower Meadow)
*Poa secunda (*One-sided bluegrass series)

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. The crosswalk produced for this project (Appendix 4) relates the principle state and national classification (c.f. Sawyer and Keeler-Wolf 1995) to the California Wildlife Habitat Relationships (Mayer and Laudenslayer 1988) and Holland (1986) classifications.

It is important to note that crosswalks are never exactly precise. Assuming that classifications arise independently, the meaning of one classification unit may not always completely encompass or be nested 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 *Artemisia californica-Eriogonum fasciculatum* can be partly in Holland's Diegan Coastal Sage Scrub or in Riversidean Sage Scrub.

The complexity and uncertainty of such relationships arise not only from independent evolution of these older 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. Further, the local meaning of types in the Holland system were addressed (instead of the strict, statewide meaning) to conform with the types used locally by the County of San Diego, and the local Holland types were translated to the list of alliances and associations as best as possible.

KEY AND DESCRIPTIONS

Table 3 contains the key for distinguishing the vegetation types. 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 first leads the user to general options, and the individual selections for vegetation alliances (and associations) are listed beneath these options. The user needs to 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 the user 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 ON THE BEST CHOICE.

The vegetation descriptions follow the key, in which the alliances and associations are nested within the forest/woodland, shrubland, and herbaceous groupings. The key and descriptions hopefully will afford further refinement to the understanding of the project area's vegetation, both from the standpoint of classification and mapping.

Table 3. Field key to the defined vegetation alliances and associations of the San Dieguito River Park area, San Diego County, California.

Class A. Vegetation with an overstory of trees (at least 5 m tall). Tree canopy may be as low as 10% over a denser understory of shrub and/or herbaceous species = **Tree Overstory Vegetation**

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 at least 5% absolute cover in desert habitats and at least 10% cover in coastal and montane habitats = **Shrub Overstory Vegetation**

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

Class A. Tree Overstory Vegetation

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

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

IA.1. Torrey pine (*Pinus torreyana*) occurs as the dominant conifer tree in an open to intermittent tree canopy. There may be an abundant understory of shrubs, sometimes much higher in cover than the pine overstory…

***Pinus torreyana* Unique Stands**

IA1.a. California sagebrush (*Artemisia californica)*, lemonade berry *(Rhus integrifolia)*, and a variety of other shrubs may occur in the understory…

***Pinus torreyana/Artemisia californica-Rhus integrifolia* Association**

IA.2. Coulter pine (*Pinus coulteri*) occurs as a dominant or co-dominant conifer tree in an open to intermittent tree canopy. There may be an abundant sub-canopy of oaks (*Quercus)* or an abundant understory of shrubs such as oaks and manzanita (*Arctostaphylos)*…

IA2.a. Canyon live oak (*Quercus chrysolepis)* occurs as the dominant sub-canopy tree with Coulter pine in the tree overstory, and Coulter pine is usually co-dominant or sub-dominant…

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

IA2.b. Coulter pine occurs with other oak or conifer species in the overstory as a dominant or co-dominant, or it occurs alone in the overstory as the dominant…

***Pinus coulteri* Alliance**

IA2b.i. Black oak *(Quercus kelloggii*) occurs as the dominant sub-canopy tree with Coulter pine in the overstory, and Coulter pine is usually dominant or co-dominant. Other oaks such as canyon live oak also may occur but in lower cover…

***Pinus coulteri-Quercus kelloggii* Association**

I.B. The conifer overstory is dominated by white fir (*Abies concolor)*, incense cedar (*Calocedrus decurrens*), bigcone Douglas-fir *(Pseudotsuga macrocarpa)* alone or with 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 a sub-canopy of oaks (*Quercus),* which may be co-dominant to sub-dominant with the Douglas-fir…

***Pseudotsuga macrocarpa* Alliance**

IB1.a. Coast live oak *(Quercus agrifolia)* occurs as a dominant sub-canopy tree and sometimes as an understory shrub. It is co-dominant or sub-dominant to bigcone Douglas-fir. Other oaks or pines may be present but in lower cover…

***Pseudotsuga macrocarpa-Quercus agrifolia* Association**

IB1.b. Canyon live oak occurs as a dominant sub-canopy tree and sometimes as an understory shrub and is co-dominant (to dominant) with 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…

***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 co-dominant to sub-dominant with white fir, and sugar pine is not present in the overstory…

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

IB3a.i. Coulter pine and Bigcone Douglas-fir occur with incense cedar and white fir, usually at lower cover values. Hardwoods also are usually present, such as canyon live oak or black oak, but usually low in cover …

***Abies concolor-Calocedrus decurrens-Pseudotsuga macrocarpa-Pinus coulteri* Association**

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

II.A. Woodlands and forests in riparian, canyon bottom, or wetland habitats where California sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii*), willows (*Salix*), and other trees dominate or co-dominate …

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 willow species or desert riparian species, which may be in the canopy or sub-canopy…

***Platanus racemosa* Alliance**

IIA1a.i. California sycamore occurs as the sole dominant tree in the canopy, and an understory of herbs are open to continuous and abundant…

***Platanus racemosal*Annual Grass-Herb 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**

IIA1b.i. Mainly arroyo willow *(Salix lasiolepis*) occurs as the dominant in the sub-canopy or shrub layer, while red willow (*Salix laevigata*) may sometimes be present. A variety of shrubs and herbs may also be present in the understory…

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

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

***Populus fremontii* Alliance**

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

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

IIA2.b. Fremont cottonwood is a dominant to co-dominant tree, and willows and/or mesquite occur in the canopy or sub-canopy as sub-dominants to co-dominants (and sometimes higher in cover than the cottonwood)…

IIA2b.i. Honey mesquite (*Prosopis glandulosa*) is present and sub-dominant to co-dominant with Fremont cottonwood. Other low trees/tall shrubs may be present as well, such as desert-willow (*Chilopsis linearis*) or willows (*Salix)*, also as sub-dominants to co-dominants...

***Populus fremontii/Prosopis glandulosa* Association**

IA2b.ii. Black willow is present and sub-dominant or co-dominant with Fremont Cottonwood and shining willow (*Salix lucida*) is usually absent. Mulefat is present with other shrubs in the understory…

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

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

***Populus fremontii-Salix laevigata* 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 canopy, and perennial pepperweed (*Lepidium latifolium*) is usually dominant in the understory…

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

IIA3a.ii. Black willow is usually dominant in the canopy, and red willow and/or arroyo willow may be present often but at low cover values. Mulefat is characteristically present and usually dominant in the understory…

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

IIA3a.iii. Black willow has shares dominance in the canopy with red willow…

***Salix gooddingii-Salix laevigata* Association**

IIA3.b. Red willow is the dominant tree in the canopy or is co-dominant with arroyo willow in the sub-canopy…

***Salix laevigata* Alliance**

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

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

IIA3.c. Arroyo willow is dominant as a small tree or tall shrub in the overstory. The canopy is over a sometimes higher cover of annual or perennial herbs such as bromes (*Bromus)*, stinging nettle (*Urtica dioica*), rushes (*Juncus),* or bulrushes (*Scirpus*)…

***Salix lasiolepis* Alliance**

IIA3c.i. Shrubland with mulefat as a characteristic species in the understory…

***Salix lasiolepis/Baccharis salicifolia* Association**

IIA.4. Desert willow (*Chilopsis linearis)* is dominant in the canopy as a low tree or tall shrub, while other shrubs may occur as sub-dominants (at low cover) in a sub-canopy…

***Chilopsis linearis* Alliance and *Chilopsis linearis* Association**

IIA.5. White alder (*Alnus rhombifolia*) is the primary tree in the overstory, or it shares dominance with other trees…

***Alnus rhombifolia* Alliance**

IIA5.a. California sycamore and canyon live oak occur as co-dominants to sub-dominants with white alder. Other hardwoods or conifers may be present, such as coast live oak and incense cedar (and sometimes also co-dominant)…

***Alnus rhombifolia-Platanus racemosa-Quercus chrysolepis* Association**

IIA.6. Coast live oak occurs as the dominant tree in the canopy, while California sycamore or other riparian trees or tall shrubs may be sub-dominant (including desert riparian species)…

***Quercus agrifolia* Alliance**

IIA6.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**

IIA6.b. Coast live oak is the sole dominant tree in the canopy, though willows, California sycamore, alders, or other riparian trees are present at low cover values. Poison oak (*Toxicodendron diversilobum)*, toyon (*Heteromeles arbutifolia),* and/or arroyo willow are often present in the understory…

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

IIA.7. One or more tamarisk (*Tamarix*) species dominates in the tree/shrub canopy, while there may be a minor presence of native trees or shrubs. The understory usually has low species richness, and it may native and non-native species…

***Tamarix* spp. Alliance**

IIA.8. 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.

IIB1a.i. A variety of herbs, mainly grasses, occur at medium to high cover values in the understory…

***Quercus engelmannii*/Grass Association**

IIB1.a.ii. White sage *(Salvia apiana)* occurs with a variety of grasses and herbs usually at medium cover values in the understory…

***Quercus engelmannii/Salvia apiana*/Grass-herb**

IIB1.a.iii. Scrub oak (*Quercus berberidifolia)* is present in the understory as the dominant shrub usually at moderate cover, and herbs occur usually at low to moderate cover values…

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

IIB1.a.iv. Chamise *(Adenostoma fasciculatum)* and bigberry manzanita *(Arctostaphylos glauca)* are present usually as co-dominant shrubs at moderate cover, and herbs occur usually at moderate to high cover values…

***Quercus engelmannii/Adenostoma fasciculatum-Arctostaphylos glauca* Association**

IIB1.b. Coast live oak is usually co-dominant with Engelmann oak in the overstory…

IIB1b.i. California sagebrush (*Artemisia californica)* is usually dominant in the shrub layer, and herbs occur usually at low cover values…

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

IIB1b.ii. Poison oak is dominant at low cover in the shrub layer, and herbs occur usually at medium to high cover values. Other shrubs, including chaparral species may be present, but not very high in cover…

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

IIB1b.iii. Chaparral species such as scrub oak, chamise, and/or bigberry manzanita are dominant in the shrub layer, and herbs occur usually at low to medium cover values…

***Quercus engelmannii-Quercus agrifolia*/Chaparral Association**

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

***Quercus agrifolia* Alliance**

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

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

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

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

IIB2.c. The overstory is dominated solely by coast live oak, and the understory is primarily dominated by a mixture of coastal sage shrubs, including California sagebrush, white sage, redberry *(Rhamnus* spp.), California buckwheat (*Eriogonum fasciculatum),* and/or laurel sumac

(*Malosma laurina)*…

***Quercus agrifolia*/Coastal Sage Scrub Association**

IIB2.d. The overstory is dominated by coast live oak while there is a sub-dominance of Engelmann oak. The understory is mainly dominated by California buckwheat and annual grasses and forbs…

***Quercus agrifolia-Quercus engelmannii/Eriogonum fasciculatum*/Annual grass-herb Association**

IIB.2.e. The overstory includes black oak as a sub-dominant to co-dominant with coast live oak, and Engelmann oak may also occur. The understory usually contains poison oak, grasses, and forbs, though it is usually diverse and including a variety of coastal sage and chaparral shrub species…

***Quercus agrifolia-Quercus kelloggii* (Peninsular Range) Association**

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

***Quercus kelloggii* Alliance**

IIB3.a. Incense cedar is sub-dominant to black oak in the overstory, and canyon live oak may also occur as a sub-dominant. All tree species may be regenerating in the understory as well. The understory is mixed with poison oak, other shrubs, and herbs…

***Quercus kelloggii-Calocedrus decurrens* Association**

IIB3.b. Canyon live oak is sub-dominant to co-dominant with black oak in the overstory. Pink-bracted manzanita *(Arctostaphylos pringlei)* and other shrubs are usually present in the understory at low to high cover, and herbs are usually relatively low in cover…

***Quercus kelloggii-Quercus chrysolepis* Association**

IIB3.c. Black oak is the sole dominant in the overstory, while other oaks or conifers may be present at low cover values. A variety of herbs are present usually at moderate to high cover in the understory, and shrubs such as poison oak may also occur in at low cover…

***Quercus kelloggii*/Annual grass-herb Association**

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

***Quercus chrysolepis* Alliance**

IIB.4.a. While canyon live oak is the primary dominant tree, bigcone Douglas-fir is characteristically present at low cover in the overstory. Bigcone Douglas-fir is primarily scattered and usually emergent to the canyon oak, and other conifers may also occur at low cover…

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

IIB.4.b. While canyon live oak is the primary dominant tree, additional oak or conifer species (other than bigcone Douglas-fir) may occur at low cover in the overstory…

***Quercus chrysolepis* Association**

IIB.5. Canyon live oak is co-dominant with one or more than one conifer species in the overstory...

IIB5.a. Bigcone Douglas-fir is co-dominant with canyon live oak, while Coulter pine may also be present and sub-dominant to co-dominant...

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

<u>Class B.</u> Shrub Overstory Vegetation

<u>Group I</u>: 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),* bush poppy *(Dendromecon),* scrub oaks (*Quercus*), coffeeberry (*Rhamnus*), etc. This group also includes vegetation dominated or co-dominated by large broad-leaved evergreen species such as *Malosma laurina* and *Rhus* spp., which may be associated with shorter non-sclerophyll shrubs.

I.A. Shrubland dominated by a manzanita (*Arctostaphylos)* species…

IA.1. Pink-bracted manzanita (*Arctostaphylos pringlei*) usually occurs as the dominant shrub, while scrub oak may be sub-dominant or co-dominant…

***Arctostaphylos pringlei* Alliance**

IA1.a. Eastwood manzanita *(Arctostaphylos glandulosa)* occurs as the dominant shrub...
***Arctostaphylos glandulosa* Alliance and *Arctostaphylos glandulosa* Association**

IA.3. Bigberry manzanita *(Arctostaphylos glauca)* occurs as the dominant shrub, and chamise *(Adenostoma fasciculatum)* usually occurs characteristically at low cover values …
***Arctostaphylos glauca* Alliance and *Arctostaphylos glauca* Association**

I.B. Shrubland with an evergreen ceanothus (*Ceanothus*) as the dominant, though other broadleaf evergreen shrubs may occur as sub-dominant. In stands with recent fire, though, species such as Sierra currant (*Ribes nevadense*) may sometimes be co-dominant…

IB.1. White coast ceanothus (*Ceanothus verrucosus)* occurs as the dominant shrub, while other shrubs such as mission manzanita (*Xylococcus bicolor*) or chamise may occur in low cover as sub-dominants…

***Ceanothus verrucosus* Alliance**

IB1.a. Mission manzanita characteristically occurs as a sub-dominant, and other shrubs also may occur as sub-dominants (including chamise)…
***Ceanothus verrucosus-Xylococcus bicolor* Association**

IB.2. Hoaryleaf ceanothus (*Ceanothus crassifolius*) occurs as the dominant shrub, while species such as mission manzanita or chamise may occur in low cover as sub-dominants…
***Ceanothus crassifolius* Alliance**

IB2.a. Chamise characteristically occurs at low cover, while hoaryleaf is dominant. Cucumber vine is often present…

***Ceanothus crassifolius* Association**

IB2.b. Mission manzanita and chamise occurs as a sub-dominant, and other shrubs also may occur as a sub-dominants…
***Ceanothus crassifolius-Adenostoma fasciculatum-Xylococcus bicolor* Association**

IB.3. Hairyleaf ceanothus (*Ceanothus oliganthus)* occurs usually as the dominant shrub. Species such as mission manzanita or chamise may occur in low cover as sub-dominants, and Sierra currant may be sub-dominant to co-dominant. (Please note: This type may also include woolyleaf ceanothus (*Ceanothus tomentosus)* as the dominant, because it was difficult to discern from hairyleaf ceanothus)…

***Ceanothus oliganthus* Alliance**

IB3.a. Mission manzanita and chamise occurs as a sub-dominant, and other shrubs also may occur as a sub-dominants…

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

IB.4. Deerbrush (*Ceanothus integerrimus*) occurs as the dominant shrub…

***Ceanothus integerrimus* Alliance**

IB.5. Chaparral whitethorn (*Ceanothus leucodermis*) occurs usually as the dominant shrub. Interior live oak (*Quercus wislizeni*) may be present as a sub-dominant, and Sierra currant may be present as a sub-dominant to co-dominant…

***Ceanothus leucodermis* Alliance**

IB5.a. Chaparral whitethorn is present as the dominant shrub. Interior live oak, California buckwheat, and/or hollyleaf redberry (*Rhamnus ilicifolia*) may be present at lower cover…

***Ceanothus leucodermis* Association**

I.C. Shrublands in which one or more oak (*Quercus*) species dominates, or there is a shared dominance of oak with other chaparral species…

IC.1. Scrub oak (*Quercus berberidifolia)* occurs as the dominant shrub with an emergent tree layer of Engelmann oak. These two oaks may also be hybridizing. Other shrubs may occur at low cover values…

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

IC.1. Scrub oak (*Quercus berberidifolia)* occurs as the dominant shrub with relatively no emergent tree layer. Other shrubs may occur at low cover values…

***Quercus berberidifolia* Alliance**

IC1.a. Scrub oak occurs as the sole dominant shrub in the overstory. Other shrubs may occur as sub-dominants, but they usually cover less than 10% of the stand…

***Quercus berberidifolia* Association**

IC1.b. Chamise and Eastwood manzanita (*Arctostaphylos glandulosa)* occur characteristically as sub-dominants, though scrub oak is dominant…

***Quercus berberidifolia-Adenostoma fasciculatum-Arctostaphylos glandulosa* Association**

IC.2. Scrub oak co-dominates with primarily with chamise (*Adenostoma fasciculatum*)…

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

IC2.a. Scrub oak and chamise occur as co-dominants, and other chaparral shrubs additively cover less than 10% of stand…

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

IC.3. Scrub oak is sub-dominant to co-dominant with Eastwood manzanita and chamise…

***Adenostoma fasciculatum-Arctostaphylos glandulosa-Quercus berberidifolia* Association**

IC.4. The overstory is usually dominated by interior live oak (*Quercus wislizeni)* alone or in shared dominance with other species (i.e., birchleaf mountain-mahogany, chaparral whitethorn, scrub oak) in the shrub and/or tree layers…

IC4.a. Chaparral whitethorn occurs as a co-dominant with interior live oak. Other shrubs may also intermix as sub-dominants, including gooseberry *(Ribes),* coffeeberry (*Rhamnus),* golden eardrops (Dicentra chrysantha), etc…

***Quercus wislizeni-Ceanothus leucodermis* Alliance**

IB4.b. Scrub oak occurs as a co-dominant with interior live oak. Various shrubs may intermix as

sub-dominants at low cover, such as manzanita, mountain-mahogany, or ceanothus…

***Quercus wislizeni-Quercus berberidifolia* Alliance and *Quercus wislizeni-Quercus berberidifolia* Association**

IC.5. Muller oak (*Quercus cornelius-mulleri*) is dominant to co-dominant in the tall shrub stratum. It occurs adjacent to desert slopes on the eastside of park, sometimes with a relatively high cover of drought-deciduous desert shrubs...

***Quercus cornelius-mulleri* Alliance**

IC5.a. Muller oak and sugarbush are co-dominant, with open understory that may also include California buckwheat, cholla (Opuntia spp.), white sage, etc. Bigberry manzanita is a common associated overstory shrub...

***Quercus cornelius-mulleri-Rhus ovata* association**

IC5.b. Muller oak scattered canopy (3-12%) over low desert shrubs such as buckwheat, matchweed (*Gutierrezia),* goldenbush *(Ericameria),* sage, etc. No other evergreen shrub exceeds Muller oak in cover although others (sugarbush, birch-leaf mountain mahogany, cupleaf ceanothus, and California juniper) in total may equal it in cover...

***Quercus cornelius-mulleri-Eriogonum fasciculatum-Ericameria linearifolia* Association**

I.D. Chaparral in which chamise is dominant, or chamise is co-dominant with manzanita, ceanothus, or coastal sage scrub species…

ID.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**

ID1.a. A mixture of coastal sage and chaparral species, including characteristic presence and sometimes co-dominance of black sage (*Salvia mellifera),* lemonade berry (*Rhus integrifolia),* laurel sumac (*Malosma laurina),* bush rue (*Cneoridium dumosum),* and California sagebrush (*Artemisia californica),* occur with chamise and mission manzanita…

***Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum-Salvia mellifera-Rhus integrifolia* Association**

ID1.b. California buckwheat (*Eriogonum fasciculatum)* and bush rue are characteristically present and similar in cover. Lemonade berry is absent…

***Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum-Eriogonum fasciculatum* Association**

ID1c. Bush rue is characteristically present and sometimes co-dominant with chamise and mission manzanita, and lemonade berry and California buckwheat are absent…

***Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum* Association**

ID1.d. White coast ceanothus characteristically occurs as a sub-dominant at low cover values…

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

ID1.e. Black sage and laurel sumac characteristically occur as co-dominants with chamise and mission manzanita…

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

ID1.f. A mixture of chaparral species, usually including hoaryleaf ceanothus, sugarbush *(Rhus ovata)*, and laurel sumac (*Malosma laurina)* characteristically occurs as a sub-dominant with chamise and mission manzanita…

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

ID.2. Chamise and white sage are both important and usually co-dominant, or white sage is sub-dominant and other coastal sage such as California sagebrush is co-dominant with chamise…

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

ID2.a. White sage and California sagebrush are sub-dominant to co-dominant (though California sagebrush may be higher in cover than white sage*,* and vice versa). If present, black sage and mission manzanita occur at trace cover …

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

ID.3. Chamise occurs as a sub-dominant or co-dominant with bush penstemon (*Keckiella antirrhinoides).* Other chaparral and coastal sage species may be present at low cover, including black sage, mission manzanita, bush rue, etc…

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

ID.4. Eastwood manzanita is co-dominant with chamise, and other shrub species may be present such as scrub oak or ceanothus, and sometimes scrub oak may be co-dominant with the manzanita and chamise…

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

ID4.a. Eastwood manzanita is the main co-dominant shrub with chamise…

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

ID4.b. Scrub oak is sub-dominant to co-dominant with Eastwood manzanita and chamise…

***Adenostoma fasciculatum-Arctostaphylos glandulosa-Quercus berberidifolia* Association**

ID.5. Bigberry manzanita is co-dominant with chamise, and other shrub species may be present such as scrub oak or ceanothus, and sometimes scrub oak may be co-dominant with the manzanita and chamise …

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

ID5.a. Bigberry manzanita is the main co-dominant shrub with chamise…

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

ID5.b. Scrub oak is sub-dominant to co-dominant with bigberry manzanita and chamise…

***Adenostoma fasciculatum-Arctostaphylos glauca-Quercus berberidifolia* Association**

ID.6. Cupleaf ceanothus *(Ceanothus greggii)* is co-dominant with chamise (30-60% relative shrub cover). Other shrub species may occur such as scrub oak or sugarbush, and sometimes the sugarbush may be co-dominant with the ceanothus and chamise…

***Adenostoma fasciculatum-Ceanothus greggi* Alliance**

ID6.a. Cupleaf ceanothus occurs as a co-dominant with chamise in an intermittent to continuous shrub overstory, and other shrub species may occur as sub-dominants…

***Adenostoma fasciculatum-Ceanothus greggi* Association**

ID.7. Chamise is mainly the sole dominant, or it is co-dominant with laurel sumac, deerweed, or other disturbance following species. Mission manzanita is usually absent...

***Adenostoma fasciculatum* Alliance**

ID7.a. Chamise is the sole dominant shrub. Other chaparral or coastal sage species such as scrub oak, manzanita, etc, may be present intermittently but at trace cover...

***Adenostoma fasciculatum* (pure) Association**

ID7.b. Chamise is the main chaparral species, while disturbance-following shrubs intermix as sub-dominants to co-dominants such as deerweed (*Lotus scoparius*), bush poppy (*Dendromecon rigida*), and chaparral bushmallow (*Malacothamnus fasciculatus*)*,* and/or yerba santa …

***Adenostoma fasciculatum* (disturbance) Association**

I.E. Shrublands in which hollyleaf cherry *(Prunus ilicifolia),* sumac (*Malosma* or *Rhus* spp.), mountain mahogany *(Cercocarpus* spp.), coffeeberry *(Rhamnus)*, and/or bush poppy is dominant or important…

IE.1. Lemonade berry *(Rhus integrifolia)* is the dominant shrub in the overstory, or it co-dominates with species such as California sagebrush, chamise, black sage, laurel sumac, etc…

***Rhus integrifolia* Alliance**

IE1.a. California sagebrush and chamise occur as sub-dominants to co-dominants with lemonade berry. Other shrubs may be also present and possibly also co-dominant, including laurel sumac, bush monkeyflower (*Mimulus aurantiacus*) and California buckwheat…

***Rhus integrifolia-Adenostoma fasciculatum-Artemisia californica* Association**

IE1.b. California sagebrush and black sage occur as sub-dominants to co-dominants with lemonade berry. Other shrubs may be also present and possibly also co-dominant, including laurel sumac, bush monkeyflower, mission manzanita, Nuttal's scrub oak *(Quercus dumosa),* and toyon (*Heteromeles arbutifolia)*…

***Rhus integrifolia-Salvia mellifera-Artemisia californica* Association**

IE.2. Hollyleaf cherry is dominant, or it is co-dominant shrub with other shrubs…

***Prunus ilicifolia* Alliance**

IE2.a. Toyon occurs as a sub-dominant to co-dominant shrub with hollyleaf cherry in the overstory…

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

IE.3. San Diego mountain mahogany *(Cercocarpus minutiflorus*) occurs as the dominant shrub, though other shrubs also may be present but at lower cover, such as black sage…

***Cercocarpus minutiflorus* Unique Stands**

IE.4. Laurel sumac occurs with California sagebrush, in which the sumac is sub-dominant or co-dominant (relative cover at least 20%)…

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

IE.5 Laurel sumac usually occurs as a dominant or co-dominant with shrubs such as California buckwheat or black sage (*Salvia mellifera*)…

***Malosma laurina* Alliance**

IE5.a. California Buckwheat occurs as a co-dominant with laurel sumac and other shrubs may occur at low cover…

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

IE5.b. California buckwheat and black sage occur with and are usually co-dominant with laurel sumac…

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

IE.6. Sugarbush *(Rhus ovata)* occurs in a scattered canopy as the dominant or co-dominant over low desert transition shrubs such as California buckwheat, matchweed (*Gutierrezia sarothrae*), Mojave yucca (*Yucca schidigera*), and cholla (*Opuntia acanthocarpa* or *echinocarpa*). No other tall shrubs exceed sugarbush in cover, although others such as California juniper (*Juniperus californicus)* desert apricot *(Prunus fasciculatus)*, and lotebush (*Ziziphus parryi)* may equal it in cover. If Muller oak equals cover of sugarbush go to Muller oak alliance...

***Rhus ovata* Alliance**

IE6.a. Sugarbush *(Rhus ovata)* occurs in a scattered canopy as a co-dominant with lotebush (*Ziziphus parryi)* as well as other tall shrubs such as California juniper, desert apricot, desert almond *(Prunus fasciculata),* catclaw acacia *(Acacia greggii)* and Mojave yucca...

***Rhus ovata-Zizyphus parryi* Association**

IE7. Sugarbush occurs as a sub-dominant to co-dominant with California buckwheat, usually in desert transitions sites…

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

IE.8. Chaparral coffeeberry (*Rhamnus tomentella*) is dominant in the shrub canopy. Other shrubs may occur but in lower cover, such as blue elderberry (*Sambucus mexicana),* western chokecherry (*Prunus virginiana)*, etc…

***Rhamnus tomentella* Alliance**

IE.9. Coffeeberry occurs as a sub-dominant to deerbrush (*Ceanothus integerrimus*)…

***Ceanothus integerrimus* Alliance**

IE.10. Bush poppy (*Dendromecon rigida*) dominates in a post-fire transition scrub, usually with chamise or other chaparral shrubs present at low cover…

***Dendromecon rigida* Alliance and *Dendromecon rigida* Association**

<u>Group II</u>. Shrublands dominated mainly by soft-leaved or succulent shrubs that are microphyllus or broad-leaved, including cactus, drought-deciduous, and 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),* sage (*Salvia*), prickly-pear (*Opuntia)*, poison oak (*Toxicodendron*), bush monkeyflower (*Mimulus)*, bush penstemon (*Keckiella)*, chokecherry or apricot (*Prunus)* species, etc.

II.A. Shrublands dominated by deciduous shrubs that are primarily found in riparian or wetland habitats, including intermittent desert washes and coastal to montane riparian habitats…

IIA.1. Shrublands characterized by a relatively high cover of a baccharis (*Baccharis)* species, though the shrub canopy is sometimes over a sometimes higher cover of annual or perennial herbs such as bromes (*Bromus)*, perennial pepperweed (*Lepidium latifolium),* poison hemlock (*Conium maculatum*), giant reed (*Arundo donax),* etc. An emergent and sparse tree layer may also be present…

IIA1.a. Coyote brush (*Baccharis pilularis*) is the most dominant shrub in the canopy…

***Baccharis pilularis* Alliance**

IIA1.b. Mulefat (*Baccharis salicifolia)* is the most dominant shrub in the canopy…

***Baccharis salicifolia* Alliance and *Baccharis salicifolia* Association**

IIA.2. Shrublands in which a willow *(Salix*) is the dominant, usually as a tall shrub or low tree. An emergent and sparse overstory tree layer may also be present…

IIA2.a. Arroyo willow *(Salix lasiolepis*) is the most dominant and tall shrub in the canopy. The understory is sometimes high in cover with annual or perennial herbs…

***Salix lasiolepis* Alliance**

IIA2a.i. Shrubland with mulefat as a characteristic species with low cover as a subdominant or with similar cover as a co-dominant with Arroyo willow…

***Salix lasiolepis/Baccharis salicifolia* Association**

IIA.2.b. Narrow leaf willow (*Salix exigua*) dominates. It is an uncommon shrubland in small stands, and the understory may be well-developed with grasses and forbs…

***Salix exigua* Alliance**

Please note: Other willow alliances will be found in **Class A. Tree Overstory Vegetation, Group II.**, section of the key.

IIA.3. Shrublands in which blue elderberry (*Sambucus mexicana)* dominates the canopy, though the shrub canopy is sometimes over a higher cover of annual or perennial herbs such as bromes (*Bromus)*, miner's lettuce (*Claytonia perfoliata), etc.* …

***Sambucus mexicana* Alliance**

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

***Tamarix* spp. Alliance**

IIA.5. Shrubland dominated by perennial salt marsh, sub - shrubby pickleweed (*Salicornia),* though the shrub canopy is sometimes over a higher cover of short annual or perennial grasses such as saltgrass (*Distichlis spicata*)*…*

IIA5.a. Shrubland dominated mostly by Parish's glasswort (*Salicornia subterminalis)…*

***Salicornia subterminalis* Alliance**

IIA5.b. Shrubland dominated or co-dominated by Virginia glasswort (*Salicornia virginica)…*

***Salicornia virginica* Alliance**

IIA5b.1. Shrubland with both Parish's and Virginia glasswort having 20%-80% relative cover…

***Salicornia virginica-Salicornia subterminalis* Association**

II.A.6. Scrublands dominated by xeromorphic, summer- or cold-deciduous riparian shrubs found in the desert or desert transition (including *Acacia, Prosopis,* and *Chilopsis*)...

IIA6.a. Catclaw acacia (*Acacia greggii)* is usually dominant in the canopy as a tall shrub, while other shrubs may occur as sub-dominants to co-dominants, such as California buckwheat, lotebush (*Ziziphus parryi),* cholla (*Opuntia* spp.), desert apricot (*Prunus fremontii)*. Usually on desert washes and bajadas that receive intermittent flooding*…*

***Acacia greggii* Alliance**

IIA6a.i. The understory is well-developed with grasses and/or forbs such as red brome (*Bromus madritensis* subsp. *rubens),* redstem stork's bill *(Erodium cicutarium),* miniature lupine (*Lupinus bicolor),* and distant phacelia (*Phacelia distans)*. The shrub overstory may be emergent and low in cover (as low as 5% absolute cover)...

***Acacia greggii*Annual Grass-Herb Association**

IIA6.b. Desert willow (*Chilopsis linearis)* is dominant in the canopy as a tall shrub or low tree, while other shrubs may occur as sub-dominants in a sub-canopy. Usually in desert or semi-desert, washes and seasonally active stream channels…

***Chilopsis linearis* Alliance and *Chilopsis linearis* Association**

IIA6.c. 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* may be as low in absolute cover as 4%. Usually associated with desert washes and springs…

***Prosopis glandulosa* Alliance**

IIA6c.i. *Prosopis glandulosa* dominant with sugarbush (*Rhus ovata)* and other large shrubs such as catclaw acacia sub-dominant in the upper desert, generally associated with hillside springs above 2500 ft...

***Prosopis glandulosa-Rhus ovata* (Upper Desert Mesquite Spring) Association**

IIA6.d. Fremont cottonwood is emergent with mesquite as major small tree or shrub. Usually associated with seasonally-flooded, desert stream channels...

***Populus fremontii/Prosopis glandulosa* Association**

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

IIB.1. Shrubland with coyote brush (*Baccharis pilularis*) as the main dominant shrub in the canopy…

***Baccharis pilularis* Alliance**

IIB.2. Shrubland with California encelia (*Encelia californica)* dominant or co-dominant in the canopy…

***Encelia californica* Alliance**

IIB2.a. California encelia mainly co-dominant with California sagebrush (*Artemisia californica)…*

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

IIB2.b. California encelia co-dominant with a variety of coastal sage shrub species, namely California sagebrush, coyote brush, and black sage *(Salvia mellifera)…*

***Encelia californica-Artemisia californica-Salvia mellifera-Baccharis pilularis* 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 (relative cover at least 20%) with coastal sage scrub species…

***Opuntia littoralis* Alliance**

IIB3a.i. Coast pricklypear shares dominance with various coastal sage scrub species such as California sagebrush and/or California buckwheat…

***Opuntia*-Mixed Coastal Sage Scrub Association**

IIB3a.ii. Coast pricklypear shares dominance with California buckwheat and laurel sumac (*Malosma laurina)* in the canopy…

Opuntia littoralis-Eriogonum fasciculatum-Malosma laurina

IIB3.b. Iceplant (*Mesembryanthemum*) or sea fig (*Carpobrotus)* is the dominant as a low shrub, though coastal sage species may be present or sub-dominant (relative cover <20%)

***Mesembryanthemum* spp. - *Carpobrotus* spp. Alliance**

IIB3b.i. Sea fig is dominant, and California sagebrush is present to subdominant…

***Carpobrotus chilensis-Artemisia californica* Association**

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

***Keckiella antirrhinoides* Alliance**

IIB4.a. Shrubland in which bush penstemon and California sagebrush provide the main cover in the canopy (their relative cover is 20% or greater). Other coastal sage species may be present such as California buckwheat, laurel sumac, white sage (*Salvia apiana)*, etc…

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

IIB4.b. Shrubland in which bush penstemon is co-dominant with chaparral species such as chamise, mission manzanita, etc…

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

IIB.5. Shrubland in which California sagebrush is dominant or it is co-dominant with white sage, California buckwheat, and/or laurel sumac in the canopy. The 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. The shrub overstory is mainly co-dominated by California sagebrush and California buckwheat…

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

IIB5a.ii. The shrub overstory is co-dominated by California sagebrush, California buckwheat, and laurel sumac (thought the sumac may exhibit lower cover)…

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

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

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

IIB5b.i. Broom baccharis (*Baccharis sarothroides)* occurs as a sub-dominant to co-dominant with the other two shrub species of the alliance…

***Artemisia californica-Salvia mellifera-Baccharis sarothroides* Association**

IIB5.c. California sagebrush is subdominant to co-dominant with chamise and white sage…

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

IIB5.d. California sagebrush is co-dominant primarily with white sage…

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

IIB5.e. California sagebrush is the sole dominant species in the canopy, or it is sometimes co-dominant with laurel sumac…

***Artemisia californica* Alliance**

IIB5e.i. California sagebrush is the sole dominant species in the canopy…

***Artemisia californica* Association**

IIB5e.ii. California sagebrush occurs with laurel sumac, in which the sumac is sub-dominant or co-dominant with a relative cover of at least 20%…

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

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

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

***Salvia apiana* Alliance**

IIB6a.i. Chaparral yucca is characteristically present at low cover while white sage is dominant…

***Salvia apiana-Yucca whipplei* Association**

IIB6.b. White sage is co-dominant with California buckwheat, though other shrubs may be present at relatively low cover such as California sagebrush, laurel sumac, spiny redberry (*Rhamnus crocea),* etc…

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

IIB6.c. Black sage is the main dominant shrub in the canopy, though other shrubs may be present at relatively low cover such as California sagebrush, California buckwheat, laurel sumac, mission manzanita, etc…

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

IIB.7. Shrubland in which a buckwheat (*Eriogonum*) species is the main dominant in the canopy. The shrub canopy is sometimes over a higher cover of annual or perennial herbs such as bromes (*Bromus)*, common sandaster (*Lessingia filaginifolia),* cryptantha *(Cryptantha)*, stork's bill filaree *(Erodium),* wild oats *(Avena),* etc …

IIB7.a. California buckwheat is dominant in the canopy, though sometimes chaparral shrubs such as sugarbush (*Rhus ovata*) may be co-dominant…

***Eriogonum fasciculatum* Alliance**

IIB7a.i. Sugarbush occurs as a sub-dominant to co-dominant with California buckwheat, usually in desert transitions sites…

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

IIB7a.ii. California buckwheat is dominant in the canopy, from coastal to inland sites…

***Eriogonum fasciculatum* Association**

IIB7.b. 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**

IIB7b.i. Wright's buckwheat is the main shrub species, while common sandaster and other herbaceous species consistently occur*...*

***Eriogonum wrightii-Lessingia filaginifolia* Association**

IIB.8. Shrublands with other subshrubs or shrubs that are usually pioneer species (e.g., *Gutierrezia sarothrae, Isocoma menziesii, 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)*, purple three-awn (*Aristida purpurea),* wild oats, etc…

IIB8.a. Matchweed (*Gutierrezia sarothrae)* is the dominant shrub species in the canopy…

***Gutierrezia sarothrae* Alliance**

IIB8a.i. Matchweed is the main shrub species, while purple needlegrass and stork's bill characteristically occur in the herb layer. Other herbs may be present, such as splendid mariposa lily (*Calochortus splendens)* and purple three-awn…

Gutierrezia sarothrae-Erodium* sp.*-Nassella pulchra

IIB8.b. Goldenbush (*Isocoma menziesii)* is the dominant shrub species in the canopy…

***Isocoma menziesii* Alliance and *Isocoma menziesii* Association**

IIB8.c. Deerweed (*Lotus scoparius)* is the dominant shrub species in the canopy, usually in a post-fire or disturbance transition scrub. Other shrubs may occur as sub-dominants, including chamise, white sage, scrub oaks, yellowstem bushmallow (*Malacothamnus densiflorus*), etc…

***Lotus scoparius* Alliance and *Lotus scoparius* Association**

II.C. Scrublands dominated by xeromorphic, summer- or cold-deciduous upland shrubs found in the desert or desert transition...

IIC.1. Catclaw acacia (*Acacia greggii)* is usually dominant in the canopy as a tall shrub, while other shrubs may occur as sub-dominants to co-dominants, such as *Eriogonum* spp., *Ziziphus parryi, Opuntia* spp., *Prunus fremontii…*

***Acacia greggii* Alliance**

IIC1.a. The understory is well-developed with grasses and/or forbs such as red brome (*Bromus madritensis* subsp. *rubens),* redstem stork's bill *(Erodium cicutarium),* miniature lupine (*Lupinus bicolor),* and distant phacelia (*Phacelia distans)*. The shrub overstory may be emergent and low in cover (as low as 5% absolute cover)...

***Acacia greggii*Annual Grass-Herb Association**

IIC.2. Desert apricot (*Prunus fremontii)* is dominant in the canopy as a small to medium-sized shrub, while other shrubs such as California buckwheat may occur as sub-dominant. If sugarbush is co-dominant, go to the *Rhus ovata* Alliance…

***Prunus fremontii* Alliance and *Prunus fremontii* Association**

IIC.3. 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* sometimes may be as low in absolute cover as 4%…

***Prosopis glandulosa* Alliance**

IIC.4. Desert sunflower (*Viguiera parishii*) is greatest cover or equal cover of any other single shrub with the emergent tall shrubs not exceeding 5% absolute cover...

***Viguiera parishii* Alliance**

a. Desert sunflower and Agave co-dominant. Mostly found on east-facing slopes below 3000 ft in elevation...

***Viguiera parishii-Agave deserti* Association**

b. Desert sunflower and California buckwheat both important (each 2% or greater), and neither exceeding the other by more than a few percent. Emergent shrubs may intermix as co-dominants, including desert apricot, catclaw acacia, etc. Found mostly on south-facing slopes above and below 3000 ft in elevation...

***Viguiera parishii-Eriogonum fasciculatum* Association**

II.D. Shrublands dominated by cold-deciduous shrubs in a variety of other habitats (coastal to montane)…

IID.1. Poison oak (*Toxicodendron diversilobum*) is the dominant shrub species in the overstory canopy. Herbs may also be present and greater in cover than the shrub overstory…

***Toxicodendron diversilobum* Alliance**

IID1.a. Bracken fern (*Pteridium aquilinum)* is the dominant species in the herb layer, sometimes much greater in cover than poison oak…

***Toxicodendron diversilobum/Pteridium aquilinum* Association**

IID.2. Blue elderberry is the dominant shrub in the canopy. Herbs may also be present and greater in cover than the shrub overstory…

***Sambucus mexicana* Alliance**

IID.3. California rose (*Rosa californica*) is the dominant shrub in the overstory. Other shrubs may be present but in lower cover, including blue elderberry and creeping snowberry (*Symphoricarpos mollis*)…

***Rosa californica* Alliance**

IID.4. Western chokecherry (*Prunus virginiana)* is the dominant shrub in the overstory. Other

shrubs may be present at lower cover, including *Rhamnus* spp., California rose, blue elderberry, creeping snowberry, etc…

***Prunus virginiana* Alliance**

IID.5. Basket bush is the dominant shrub in the canopy. Other shrubs may be present but in lower cover, including blue elderberry, Wright's buckwheat, poison oak, etc…

***Rhus trilobata* Alliance**

Class C. Herbaceous Vegetation

Group I. Vegetation is dominated by mainly wetland forb species, including cattail (Typha), rush (Juncus), sedge (Carex), spikerush (Eleocharis), and giant reedgrass (Arundo) species. Woody species cover <2% of the ground surface.

I.A. Stands dominated with > 20% absolute cover by tall (generally > 1 m) wetland grasses and graminoids including cattails *(Typha)*, bulrushes and tules (*Scirpus*), and reeds (*Arundo donax*), though there may sometimes be greater cover of shorter herbs and graminoids.

IA.1. Vegetation dominated by California Bulrush (*Scirpus californicus*) and/or the ecologically and morphologically similar hardstem bulrush (*Scirpus acutus).* Occasionally *Typha* spp. may occur in equal or higher cover than the *Scirpus* spp., but *Scirpus californicus* or *S. acutus* always at least 20% relative cover…

***Scirpus californicus- Scirpus acutus* Alliance**

IA1.a. Either bulrush (*Scirpus acutus* or *S. californicus)* is dominant in the stands with little cover (<20% relative cover) or no cover of other species…

***Scirpus californicus-S. acutus* Association**

IA1.b. Stands co-dominated in the overstory with *Scirpus californicus* (and/or *S. acutus)* and cattail (*Typha angustifolia, T. latifolia,* and/or *T. domingensis).* Cattail may have a lower (down to 2%) to somewhat higher cover (up to 60%)…

***Scirpus* (*californicus* and/or *acutus*)-*Typha* Association**

IA.2. Vegetation dominated by cattail species, including *Typha angustifolia, T. latifolia,* and *T. domingensis*. The distinguishing features of these three species are often blurred. Multiple *Typha* species may be found in the same stand, and they are considered ecologically equivalent…

***Typha* spp. Alliance**

IA2.a. *Typha latifolia* is strongly dominant, without clear identification of any other associated species …

***Typha latifolia* Association**

IA.3. Dense stands dominated by *Arundo donax* (Giant reed), generally small and locally distributed near settlements, agricultural fields, and roads…

***Arundo donax* Alliance**

I.B. Stands dominated (>60% relative cover) by grasses and graminoids that are generally between 0.1-1 m tall, including rushes (*Juncus)* and sedges *(Carex)*.

IB.1. Vegetation dominated >60% relative cover by the stoloniferous (clonal) rush *Juncus mexicanus* (and including individuals more closely resembling *Juncus balticus*), often associated with other taller or shorter herbaceous species. Of usually temporarily saturated wetlands not inundated for extensive periods…

***Juncus balticus-Juncus mexicanus* Alliance**

IB1.a. Stands strongly dominated by Mexican rush (*Juncus mexicanus)* with low cover of other

species…

***Juncus mexicanus* Association**

IB.2. Vegetation dominated >60% relative cover by the clump-forming rush *Juncus effusus*, often associated with other taller or shorter herbaceous species. Of usually temporarily saturated wetlands not inundated for extensive periods…

***Juncus effusus* Alliance**

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**

IC1.a. Vegetation is co-dominated by yerba mansa and Mexican rush (relative cover of each >30%)…

***Anemopsis californica-Juncus mexicanus* Association**

IC.2. Vegetation dominated >20% relative cover by the western ragweed, though other forb, grass, rush, etc., species also may occur…

***Ambrosia psilostachya* Alliance**

IC2.a. Vegetation is co-dominated by western ragweed and Hall's gumweed (*Grindelia hirsutula* var. *hallii*)…

***Ambrosia psilostachya- Grindelia hirsutula* var. *hallii* Association**

IC.3. Vegetation dominated solely by perennial pepperweed along intermittently and seasonally flooded drainages...

***Lepidium latifolium* Alliance**

IC.4. Vegetation dominated by other herbs along flooded lake portions or river bank, including an assortment of native or non-native species such as *Pluchea odorata, Conium maculatum, Alopecurus saccatus, Cyperus* spp.*, Amaranthus albus,* and *Echinochloa crus-galli…*

Disturbed Temporarily to Seasonally Flooded Grasslands & Forbs

IC.5. Vegetation dominated by native perennial salt marsh sub-shrubby or herbaceous pickleweed (*Salicornia),* though the shrub canopy is sometimes over a higher cover of short annual or perennial grasses such as saltgrass (*Distichlis spicata*)*.*

IC5.a. Shrubland dominated mostly by Parish's glasswort (*Salicornia subterminalis)…*

***Salicornia subterminalis* Alliance**

IC5.b. Shrubland dominated or co-dominated by Virginia glasswort (*Salicornia virginica)…*

***Salicornia virginica* Alliance**

IC5b.1. Shrubland with both Parish's and Virginia glasswort having 20%-80% relative cover…

***Salicornia virginica-Salicornia subterminalis* Association**

<u>Group II.</u> Vegetation dominated mainly by upland and mesic herbaceous species, including native and exotic grasses, forbs, and cryptogamic species. If woody species are present, they cover <2% of the ground surface.

II.A. Vegetation dominated by forbs such as western ragweed, Bracken fern (*Pteridium aquilinum),* etc. …

IIA.1. Western ragweed has at least >20% relative cover in the herb layer. Other forbs, grasses,

rushes, etc, also may occur in the herbaceous layer…

***Ambrosia psilostachya* Alliance**

IIA1.a. Vegetation is co-dominated by western ragweed and Hall's gumweed (*Grindelia hirsutula* var. *hallii*)…

***Ambrosia psilostachya- Grindelia hirsutula* var. *hallii* Association**

IIA.2. Bracken fern (*Pteridium aquilinum)* is a dominant species in the herb layer. Poison oak is present in the shrub layer, though, it may be much lower in cover than bracken fern…

***Toxicodendron diversilobum/Pteridium aquilinum* Association**

II.B. Vegetation dominated by a mixture of native perennial grasses and annuals, with the native grasses usually make up >10% relative cover of the herbaceous layer (though absolute cover may be <5%)…

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

***Nassella pulchra* Alliance**

IIB1.a. Purple needlegrass co-occurs with wild-oats *(Avena barbata)*, stork's bill filaree *(Erodium*), and native herbs such as mariposa lily (*Calochortus)*…

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

IIB.2. Native grass component is mainly purple three-awn (*Aristida purpurea)*, or a mixture of purple-three awn with purple needlegrass. The native grass usually make up >10% relative cover of the herbaceous layer though the *Aristida* may be as low as 2% in absolute cover…

***Aristida purpurea* Alliance and *Aristida purpurea* Association**

II.C. Vegetation dominated mainly by annual grasses and herbs of various assortments, and perennial grasses are trace in cover (<2% absolute cover). If in desert habitats, shrubs are less than 3% in the overstory (see shrubland key is shrubs are at least 3% cover)…

California Annual Grassland Alliance

IIC.1. Spanish brome (*Bromus madritensis*) is abundant; however, an assortment of other herbs and grasses also usually occur in the stands, including native species such as coyote gourd (*Cucurbita palmata),* sacred thorn-apple *(Datura wrightii),* and common sandaster (*Lessingia filaginifolia)*…

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

IIC.2. Ripgut brome (*Bromus diandrus*) is abundant or co-dominant with other non-native grasses. Other herbs and grasses usually occur in the stands, including native species such as western ragweed, common sandaster, blue wildrye (*Elymus glaucus),* dove weed (*Eremocarpus setigerus),* miniature lupine (*Lupinus bicolor),* and vinegarweed (*Trichostema lanceolatum),* and *Lotus…*

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

IIC.3. Cheatgrass (*Bromus tectorum)* is dominant, though other grasses or forbs may be sub-dominant such as Spanish brome or ripgut brome. Native species may include miner's lettuce (*Claytonia perfoliata),* miniature lupine, strigose bird's-foot trefoil (*Lotus strigosus),* and clover (*Trifolium* sp.)…

***Bromus tectorum* Association**

II.D. Vegetation dominated mainly by bushy spikemoss, while a sparse overstory of shrubs may be present…

***Selaginella bigelovii* Alliance**

IID.1. A sparse overstory of California buckwheat *(Eriogonum fasciculatum)* occurs with the spikemoss…

***Selaginella bigelovii-Eriogonum fasciculatum* Association**

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

ASSOCIATIONS
Abies concolor-Calocedrus decurrens-Pseudotsuga macrocarpa-Pinus coulteri

LOCAL VEGETATION DESCRIPTION
Stands of *Abies concolor-Calocedrus decurrens* Woodland and Forest form an intermittent to continuous tree layer (10-88%, mean 45.6%) at 10-35m tall, a sparse shrub layer (0.2-8%, mean 3.3%) at 0.5-1m tall, and a sparse herbaceous layer (1-35%, mean 14.8%) at 0-0.5m tall. *Abies concolor* and *Calocedrus decurrens* co-dominate in the overstory tree layer and they are usually regenerating in the understory. Total vegetation cover is 25-85%, mean of 50.2%.

In the *Abies concolor-Calocedrus decurrens-Pseudotsuga macrocarpa-Pinus coulteri* Association, conifers dominate (see species table) though hardwoods are present including *Quercus chrysolepis* and *Q. kelloggii. Toxicodendron diversilobum* is also characteristically present in the shrub layer, and *Elymus glaucus* is characteristically present in the herb layer.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 5087-5614 ft, mean 5370 ft
Aspect: variable (NW to SW)
Slope: gentle to somewhat steep, range 2-21 degrees, mean 13.2 degrees
Topography: flat or undulating, usually upper slopes
Litter Cover: range 65-90%, mean 80.0%
Rock Cover: range 0.4-3%, mean 1.6%
Bare Ground: range 8-30%, mean 16.3%
Parent Material: mixed granitic and metamorphic
Soil Texture: medium loam to medium silt

The *Abies concolor-Calocedrus decurrens* Alliance was sampled only on gentle to moderately steep, upper slopes of Volcan Mountain, at higher elevations in the Palomar - Cuyamaca Peak (M262Bo) Subsection.

Samples used to describe alliance: (n=5) SDRP0211, SDRP0219, SFVW134, SFVW135, SFVW136

RANK: G3 S3?

GLOBAL DISTRIBUTION
Alliance: montane Peninsular Ranges (including middle to higher elevation mountains of W Riverside and San Diego Counties) to southern and central montane Sierra Nevada, California (based on recent data analysis)

Abies concolor-Calocedrus decurrens-Pseudotsuga macrocarpa-Pinus coulteri Association: southern Peninsular Range (including San Diego County Palomar - Cuyamaca Peak region); it appears to be endemic to this area, though full distribution is not known

REFERENCES
Hautain In publication, Klein and Evens 2005, Potter 2003

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

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	ABCO-t	*Abies concolor*	1	20.0	2	45
	CADE27-t	*Calocedrus decurrens*	1	19.4	5	30
	PICO3-t	*Pinus coulteri*	1	4.6	0.2	8
	QUCH2-t	*Quercus chrysolepis*	0.8	1.9	0.2	8
	QUKE-t	*Quercus kelloggii*	0.8	1.6	1	3
	PSMA-t	*Pseudotsuga macrocarpa*	0.6	1.8	1	5
Tree Understory						
	CADE27-l	*Calocedrus decurrens*	0.6	0.5	0.2	2
	ABCO-m	*Abies concolor*	0.6	0.3	0.2	1
	CADE27-m	*Calocedrus decurrens*	0.6	0.3	0.2	1
	QUCH2-m	*Quercus chrysolepis*	0.4	0.4	1	1
	CONU4	*Cornus nuttallii*	0.4	0.1	0.2	0.2
	QUKE-m	*Quercus kelloggii*	0.4	0.1	0.2	0.2
	ABCO-l	*Abies concolor*	0.2	0.0	0.2	0.2
	PICO3-l	*Pinus coulteri*	0.2	0.0	0.2	0.2
	PICO3-m	*Pinus coulteri*	0.2	0.0	0.2	0.2
Shrub						
	RIRO	*Ribes roezlii*	0.8	1.5	0.2	4
	TODI	*Toxicodendron diversilobum*	0.4	1.0	0.2	5
	RIAM	*Ribes amarum*	0.2	0.2	1	1
Herbaceous						
	ELGL	*Elymus glaucus*	0.8	0.7	0.2	3
	CLPE	*Claytonia perfoliata*	0.6	10.4	7	36
	GAAP2	*Galium aparine*	0.4	0.8	2	2
	NEME	*Nemophila menziesii*	0.4	0.8	1	3
	GAAN	*Galium andrewsii*	0.4	0.1	0.2	0.2
	COHE	*Collinsia heterophylla*	0.2	1.6	8	8
	TRIFO	*Trifolium*	0.2	0.4	2	2
	ACMI2	*Achillea millefolium*	0.2	0.2	1	1
	BROMU	*Bromus*	0.2	0.2	1	1
	COGR4	*Collomia grandiflora*	0.2	0.2	1	1
	BRDI3	*Bromus diandrus*	0.2	0.0	0.2	0.2
	BRTE	*Bromus tectorum*	0.2	0.0	0.2	0.2
	CALOC	*Calochortus*	0.2	0.0	0.2	0.2
	CLARK	*Clarkia*	0.2	0.0	0.2	0.2
	LAVEA	*Lathyrus vestitus* subsp. *alefeldii*	0.2	0.0	0.2	0.2
	LEFI11	*Lessingia filaginifolia*	0.2	0.0	0.2	0.2
	LOTUS	*Lotus*	0.2	0.0	0.2	0.2
	MOLA2	*Monardella lanceolata*	0.2	0.0	0.2	0.2
	POGL9	*Potentilla glandulosa*	0.2	0.0	0.2	0.2
Cryptogam						
	LICHEN	*Lichen*	0.2	0.0	0.2	0.2
	MOSS	*Moss*	0.2	0.0	0.2	0.2

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

ASSOCIATIONS
Alnus rhombifolia-Platanus racemosa-Quercus chrysolepis

LOCAL VEGETATION DESCRIPTION
Stands of *Alnus rhombifolia* Woodland and Forest form an intermittent to continuous tree layer (57-75%, mean 66%) at 15-35m tall, a sparse to open shrub layer (6-33%, mean 16.7%) at 0.5-2m tall, and a sparse herbaceous layer (3-6%, mean 4%) at 0-0.5m tall. *Alnus rhombifolia* is dominates or sub-dominant with other broad-leaf species in the tree layer, occurring with a variety of other tree species. Total vegetation cover is 70-85%, mean 79.3%.

In the *Alnus rhombifolia-Platanus racemosa-Quercus chrysolepis* Association*, Alnus rhombifolia* is dominant or sub-dominant with *Platanus racemosa* and *Quercus chrysolepis. Quercus agrifolia* and *Calocedrus decurrens* may also be in the tree layer. A variety of associated shrub and herb species such as *Rubus discolor* and *Bromus diandrus* are also present (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 3456-3576 ft, mean 3520 ft
Aspect: variable
Slope: gentle, range 2-2 degrees, mean 2.0 degrees
Topography: often undulating and occasionally concave, bottom
Litter Cover: range 68.7-85%, mean 76.9%
Rock Cover: range 10-21%, mean 15.5%
Bare Ground: range 0.2-5%, mean 2.6%
Parent Material: schist
Soil Texture: medium to very fine loamy sand or medium silt loam

The alliance is found along perennially flowing creeks in the upper drainages of the San Dieguito River watershed along Santa Ysabel Creek within the Palomar - Cuyamaca Peak (M262Bo) Subsection.

Samples used to describe alliance: (n=3) SDRP0008, SDRP0172, SDRP0176

RANK: G3 S3 and 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, South Coast, montane Transverse and Peninsular Ranges (including San Gabriel, San Bernardino, San Jacinto, and San Diego County Mountains), Anza-Borrego Desert

Alnus rhombifolia-Platanus racemosa-Quercus chrysolepis Association: Peninsular Ranges (including San Diego County: Palomar - Cuyamaca Peak region), 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, Hanes 1976, Keeler Wolf 1990, Klein and Evens 2005, Minnich 1976, NatureServe et al. 2003b, Potter 2003, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Alnus rhombifolia* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	ALRH2	*Alnus rhombifolia*	1	32.7	6	47
	PLRA-t	*Platanus racemosa*	1	10.7	2	23
	QUCH2-t	*Quercus chrysolepis*	1	4.3	1	10
	QUAG-t	*Quercus agrifolia*	0.7	19	15	42
	CADE27-t	*Calocedrus decurrens*	0.3	0.3	1	1
Tree Understory						
	AIAL	*Ailanthus altissima*	0.7	0.1	0.2	0.2
	QUAG-m	*Quercus agrifolia*	0.3	0.3	1	1
	QUCH2-m	*Quercus chrysolepis*	0.3	0.3	1	1
Shrub						
	SYMO	*Symphoricarpos mollis*	0.7	3.4	0.2	10
	ROCA2	*Rosa californica*	0.7	0.4	0.2	1
	TODI	*Toxicodendron diversilobum*	0.7	0.4	0.2	1
	SYAL	*Symphoricarpos albus*	0.3	4.7	14	14
Herbaceous						
	RUDI2	*Rubus discolor*	1	5.7	0.2	12
	BRDI3	*Bromus diandrus*	1	1.5	0.2	4
	EPILO	*Epilobium ciliatum*	0.7	0.4	0.2	1
	EPILO	*Epilobium*	0.7	0.4	0.2	1
	MENTH	*Mentha*	0.7	0.1	0.2	0.2
	MENTH	*Mentha (spicata)*	0.7	0.1	0.2	0.2
	CLPE	*Claytonia perfoliata*	0.3	0.7	2	2
	JUEFP	*Juncus effusus* var. *pacificus*	0.3	0.3	1	1
	RUAC3	*Rumex acetosella*	0.3	0.3	1	1

***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 (46-90%, mean 68%), a sparse shrub layer (0.2-2%, mean 1.1%), and a sparse herbaceous layer (1-10%, mean 5.5%) at 0-0.5m tall. *Calocedrus decurrens* dominates in the tree layer, and it usually is found regenerating in the understory. Hardwoods and other conifers also may be found in this layer. Total vegetation cover is 60-85%, mean 72.5%.

In the *Calocedrus decurrens-Quercus chrysolepis-Quercus kelloggii* Association, *Calocedrus decurrens* dominates while *Quercus chrysolepis* and *Quercus kelloggii* are found consistently but with lower cover. *Toxicodendron diversilobum* is found characteristically in low cover in the shrub layer, and *Elymus glaucus* is found consistently in low cover in the herb layer.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4944-5286 ft, mean 5115 ft
Aspect: NE or SW
Slope: somewhat steep to steep, range 24-28 degrees, mean 26.0 degrees
Topography: convex or concave, bottom to middle slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed granitic and metamorphic
Soil Texture: no data

The *Calocedrus decurrens* Alliance was sampled in draws and bottom slopes of Volcan Mountain found at higher elevations in the Palomar - Cuyamaca Peak (M262Bo) Subsection.

Samples used to describe alliance: (n=2) SDRP0201, SDRP0220

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 San Jacinto and San Diego County Mountains, Baja California

Calocedrus decurrens-Quercus chrysolepis-Quercus kelloggii Association: sporadically occurring in the Peninsular Ranges (including San Diego County: Palomar - Cuyamaca Peak region and W 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
Klein and Evens 2005, Kruckeberg 1984, NatureServe et al. 2003b, Potter 2003, Sawyer and Keeler-Wolf 1995

***Calocedrus decurrens* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	CADE27-t	*Calocedrus decurrens*	1	55	30	80
	QUCH2-t	*Quercus chrysolepis*	1	9.5	4	15
	QUKE-t	*Quercus kelloggii*	1	4.6	0.2	9
	QUAG-t	*Quercus agrifolia*	0.5	0.5	1	1
Tree Understory						
	CADE27-l	*Calocedrus decurrens*	0.5	2.5	5	5
Shrub						
	TODI	*Toxicodendron diversilobum*	1	1.1	0.2	2
	RIRO	*Ribes roezlii*	0.5	0.1	0.2	0.2
	RHTO6	*Rhamnus tomentella*	0.5	0.1	0.2	0.2
	SAME5	*Sambucus mexicana*	0.5	0.1	0.2	0.2
Herbaceous						
	ELGL	*Elymus glaucus*	1	0.2	0.2	0.2
	WOFI	*Woodwardia fimbriata*	0.5	2.5	5	5
	HIIN3	*Hirschfeldia incana*	0.5	1.5	3	3
	STME2	*Stellaria media*	0.5	0.1	0.2	0.2
	MICA3	*Mimulus cardinalis*	0.5	0.1	0.2	0.2
	JUEFP	*Juncus effusus* var. *pacificus*	0.5	0.1	0.2	0.2
	CLRH	*Clarkia rhomboidea*	0.5	0.1	0.2	0.2
	GAAP2	*Galium aparine*	0.5	0.1	0.2	0.2
	BRDI3	*Bromus diandrus*	0.5	0.1	0.2	0.2
	AVBA	*Avena barbata*	0.5	0.1	0.2	0.2
	CAPR5	*Carex praegracilis*	0.5	0.1	0.2	0.2
Cryptogam						
	LICHEN	Lichen	0.5	0.1	0.2	0.2
	MOSS	Moss	0.5	0.1	0.2	0.2

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

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Eucalyptus* Woodland form an open to intermittent tree layer (14-40%, mean 25.7%) at 10-15m tall, an sparse to open shrub layer (0.2-15%, mean 6.1%) at 0-5m tall, and an open to continuous herbaceous layer (30-80%, mean 55%) at 0.5-1m tall. One or more *Eucalyptus* species dominate the tree layer, such as *Eucalyptus camaldulensis* and/or *E. globulus*. The herbaceous layer is dominated by non-native species such as *Brachypodium distachyon, Hirschfeldia incana,* and *Centaurea melitensis.*Total vegetation cover is 70-85%, mean 78.3%.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 8-60 ft, mean 25 ft
Aspect: often flat, occasionally NE
Slope: flat to gentle, range 0-1 degree, mean 0.7 degrees
Topography: flat, often bottom, occasionally lower slope
Litter Cover: 60%, mean 60% (from one plot)
Rock Cover: 0%, mean 0.4% (from one plot)
Bare Ground: 35%, mean 35% (from one plot)
Parent Material: sandstone
Soil Texture: medium to very fine sandy loam (from one plot)

The *Eucalyptus* spp. Alliance was sampled in riparian corridors of the Coastal Hills (261Bi) Subsection, particularly along San Dieguito River to the west of Lake Hodges. The alliance appears to be naturalized and not specifically planted in riparian zones, including stands of river redgum and/or Tasmanian bluegum.

Samples used to describe alliance: (n=3) SDRP0405, SDRP0410, SDRP0411

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, NatureServe et al. 2003a, Sawyer and Keeler-Wolf 1995

***Eucalyptus* spp. Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	EUCAL	*Eucalyptus (globulus* or *camaldulensis)*	1	25.7	14	40
Shrub						
	TAMAR2	*Tamarix*	0.7	0.1	0.2	0.2
	RHIN2	*Rhus integrifolia*	0.3	4	12	12
	SAME5	*Sambucus mexicana*	0.3	0.7	2	2
	ERFA2	*Eriogonum fasciculatum*	0.3	0.3	1	1
	NIGL	*Nicotiana glauca*	0.3	0.3	1	1
Herbaceous						
	BRDI2	*Brachypodium distachyon*	0.7	14.3	18	25
	HIIN3	*Hirschfeldia incana*	0.7	8.7	6	20
	CEME2	*Centaurea melitensis*	0.3	3.3	10	10
	BROMU	*Bromus*	0.3	2.7	8	8
	HOMA2	*Hordeum marinum*	0.3	2	6	6
	BRDI3	*Bromus diandrus*	0.3	1.7	5	5
	AMPS	*Ambrosia psilostachya*	0.3	1.3	4	4
	CUFO	*Cucurbita foetidissima*	0.3	0.7	2	2
	FOVU	*Foeniculum vulgare*	0.3	0.7	2	2
	BRMA3	*Bromus madritensis*	0.3	0.7	2	2
	TYDO	*Typha domingensis*	0.3	0.3	1	1
	XAST	*Xanthium strumarium*	0.3	0.3	1	1

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

ASSOCIATIONS
Pinus coulteri-Quercus kelloggii

LOCAL VEGETATION DESCRIPTION
Stands of *Pinus coulteri* Woodland and Forest form an open to continuous tree layer (14-72%, mean 43%) at 10-35m tall, an open to intermittent shrub layer (2-50%, mean 18.4%) at 0.5-2m tall, and an open to continuous herbaceous layer (12-70%, mean 44.4%) at 0-1m tall. *Pinus coulteri* dominates or co-dominate in the tree layer, and conifers and hardwoods are regenerating in the medium and low layers. Total vegetation cover is 68-98%, mean 81.8%.

In the *Pinus coulteri-Quercus kelloggii* Association, *Quercus kelloggii* is sub-dominant or co-dominant with *Pinus coulteri.* Most of the *Pinus coulteri* stands are exhibiting drought stress, with yellowing needles and dying or downed trees, while some stands have regenerating pines. Other *Quercus* species such as *Q. chrysolepis* and *Q. agrifolia* may also be present and/or sub-dominant in the tree, shrub, and/or herbaceous layer. *Bromus diandrus* dominates in the understory herbaceous layer which consists of a variety of native and non-native species (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4123-5200 ft, mean 4376 ft
Aspect: variable but more often NE or neutral slopes
Slope: somewhat steep, range 15-18 degrees, mean 16.6 degrees
Topography: often undulating, occasionally convex
Litter Cover: range 92.3%, mean 92.3% (from two plots)
Rock Cover: range 0.4%, mean 0.4% (from two plots)
Bare Ground: range 2%, mean 2% (from two plots)
Parent Material: mixed granitic and metamorphic
Soil Texture: medium to very fine sandy loam or fine silty clay (from two plots)

Pinus coulteri Alliance was sampled on Volcan Mountain and the hills west of Santa Ysabel Ranch, which are in the Palomar - Cuyamaca Peak (M262Bo) Subsection. They especially occur on upper slopes that are neutral or north-facing.

Samples used to describe alliance: (n=5) SDRP0015, SDRP0016, SDRP0185, SDRP0186, SDRP0218

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: montane Central Coast (from Contra Costa County south to Santa Barbara County), inner South Coast and montane Transverse and Peninsular Ranges (including San Bernardino, Santa Ana, San Jacinto, and San Diego County Mountains), Anza-Borrego Desert, to Baja California

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

REFERENCES
Borchert et al. 2004, CNPS and CDFG 2005a, CDFG 1998, Hanes 1976, Keeler-Wolf 1990, Klein and Evens 2005, Minnich 1976, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Pinus coulteri* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	PICO3-t	*Pinus coulteri*	1	27.6	10	45
	QUKE-t	*Quercus kelloggii*	1	10.6	2	30
	QUAG-t	*Quercus agrifolia*	0.2	3	15	15
	QUCH2-t	*Quercus chrysolepis*	0.2	1.2	6	6
	CADE27-t	*Calocedrus decurrens*	0.2	0.6	3	3
Tree Understory						
	PICO3-l	*Pinus coulteri*	0.4	0.6	1	2
Shrub						
	TODI	*Toxicodendron diversilobum*	0.4	6	7	23
	LOSU2	*Lonicera subspicata*	0.4	4.4	10	12
	SYMO	*Symphoricarpos mollis*	0.2	9	45	45
	ROCA2	*Rosa californica*	0.2	0.4	2	2
	SOCA5	*Solidago californica*	0.2	0.2	1	1
Herbaceous						
	BRDI3	*Bromus diandrus*	1	32	3	60
	GAAP2	*Galium aparine*	0.6	4.6	1	20
	CLPE	*Claytonia perfoliata*	0.6	1.2	0.2	5
	ACMI2	*Achillea millefolium*	0.6	0.8	1	2
	BRHO2	*Bromus hordeaceus*	0.6	0.6	0.2	2
	ELGL	*Elymus glaucus*	0.6	0.3	0.2	1
	BRTE	*Bromus tectorum*	0.4	0.6	1	2
	BRAR3	*Bromus arenarius*	0.2	1	5	5
	THFE	*Thalictrum fendleri*	0.2	0.6	3	3
	AVBA	*Avena barbata*	0.2	0.6	3	3
	OSBR	*Osmorhiza brachypoda*	0.2	0.2	1	1
	CAMA24	*Calystegia macrostegia*	0.2	0.2	1	1
	CYEC	*Cynosurus echinatus*	0.2	0.2	1	1
Epiphyte						
	PHLI4	*Phoradendron libocedri*	0.2	0.6	3	3

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

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
The stand of *Pinus coulteri-Quercus chrysolepis* Woodland and Forest forms an intermittent conifer layer and intermittent hardwood layer (65%). The total tree layer is continuous (106%). There is a sparse shrub layer (2%, mean 2%) and a sparse herbaceous layer (2%). *Pinus coulteri* and *Quercus chrysolepis* co-dominate in the tree layer and are regenerating in the medium and low layers. Total vegetation cover is 85%.

In one sample of the *Pinus coulteri-Quercus chrysolepis* Alliance, *Pinus coulteri* and *Quercus chrysolepis* are co-dominant in the tree overstory. Other conifers and hardwoods are found in the tree understory but with relatively low cover. The understory shrub and herbaceous layers are sparse but include native species diversity (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, 5322 ft
Aspect: SW
Slope: moderate, 14 degrees
Topography: undulating, upper slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed granitic and metamorphic
Soil Texture: no data

Pinus coulteri-Quercus chrysolepis Alliance was sampled as a transitional plant community to oak woodland/forest and chaparral, found on an upper, south-facing slope of Volcan Mountain, which is in the Palomar - Cuyamaca Peak (M262Bo) Subsection.

Samples used to describe alliance: (n=1) SDRP0210

RANK: G3 S3

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

REFERENCES
CDFG 1998, CNPS and CDFG 2005a, Klein and Evens 2005, Sawyer and Keeler-Wolf 1995

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

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	QUCH2-t	*Quercus chrysolepis*	1	65	65	65
	PICO3-t	*Pinus coulteri*	1	40	40	40
Tree Understory						
	PICO3-m	*Pinus coulteri*	1	1	1	1
	CADE27-m	*Calocedrus decurrens*	1	0.2	0.2	0.2
	QUCH2-m	*Quercus chrysolepis*	1	0.2	0.2	0.2
	QUKE-l	*Quercus kelloggii*	1	0.2	0.2	0.2
Shrub						
	TODI	*Toxicodendron diversilobum*	1	1	1	1
	SAME5	*Sambucus mexicana*	1	0.2	0.2	0.2
Herbaceous						
	STME2	*Stellaria media*	1	0.2	0.2	0.2
	AVBA	*Avena barbata*	1	0.2	0.2	0.2
	BRDI3	*Bromus diandrus*	1	0.2	0.2	0.2
	CAAL2	*Calochortus albus*	1	0.2	0.2	0.2
	GAAN	*Galium andrewsii*	1	0.2	0.2	0.2
	ELGL	*Elymus glaucus*	1	0.2	0.2	0.2
	SOCA5	*Solidago californica*	1	0.2	0.2	0.2
	CAOC6	*Calystegia occidentalis*	1	0.2	0.2	0.2

***Pinus torreyana* Unique Stands (Torrey Pine)**

ASSOCIATIONS
Pinus torreyana/Artemisia californica-Rhus integrifolia

LOCAL VEGETATION DESCRIPTION
Stands of *Pinus torreyana* Woodland form a sparse to open tree layer (6-28%, mean 14.3%) at 2-20m tall, an open shrub layer (18-25%, mean 22.3%) at 0.5-5m tall, and a sparse herbaceous layer (0.2-2%, mean 1.1%) at 0-0.5m tall. *Pinus torreyana* dominates in the tree layer. Total vegetation cover is 29-45%, mean 34.7%.

In the *Pinus torreyana/Artemisia californica-Rhus integrifolia* Association, *Pinus torreyana* dominates in the overstory, and *Artemisia californica* and *Rhus integrifolia* co-dominate in the shrub layer. *Eriogonum fasciculatum* is also consistently found and can co-dominate. The herbaceous layer is sparse, low in diversity, and includes native and non-native species.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 258-324 ft, mean 291 ft
Aspect: often NW, occasionally NE
Slope: gentle to steep, range 1-45 degrees, mean 16.0 degrees
Topography: undulating, bottom to upper slope
Litter Cover: range 49.5-79%, mean 64.4%
Rock Cover: range 0.4-5%, mean 2.3%
Bare Ground: range 15-44%, mean 29.5%
Parent Material: sandstone or alluvium and other deposits
Soil Texture: medium to very fine loamy sand

The *Pinus torreyana* Unique Stands were sampled only in the Coastal Terraces (261Bj) Subsection. It was found along the top of a coastal bluff/terrace area with sandstone or marine sedimentary parent material, in which a housing development has an adjacent impact.

Samples used to describe alliance: (n=3) SDRP0248, SDRP0253, SDRP0257

RANK: G1 S1

GLOBAL DISTRIBUTION
Alliance: southern outer South Coast, Channel Islands (Santa Rosa Island)

Pinus torreyana/Artemisia californica-Rhus integrifolia Association: South Coast (San Diego County: coastal terraces)

REFERENCES
Holland 1986, Sawyer and Keeler-Wolf 1995

***Pinus torreyana* Unique Stands**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	PITO	*Pinus torreyana*	1	14.3	6	28
Shrub						
	ARCA11	*Artemisia californica*	1	3.3	2	5
	RHIN2	*Rhus integrifolia*	1	2.7	0.2	6
	ERFA2	*Eriogonum fasciculatum*	1	2.7	0.2	6
	LOSC2	*Lotus scoparius*	0.7	3	3	6
	MALA6	*Malosma laurina*	0.7	1.7	0.2	5
	ATCA2	*Atriplex canescens* var. *canescens*	0.7	1.3	2	2
	ENCA	*Encelia californica*	0.7	0.7	0.2	2
	SALA6-m	*Salix lasiolepis*	0.7	0.4	0.2	1
	ADFA	*Adenostoma fasciculatum*	0.3	2.7	8	8
	CAED3	*Carpobrotus edulis*	0.3	1.7	5	5
	ATLE	*Atriplex lentiformis*	0.3	1	3	3
	ACCY2	*Acacia cyclops*	0.3	1	3	3
	ISME5	*Isocoma menziesii*	0.3	0.7	2	2
	MYLA5	*Myoporum laetum*	0.3	0.3	1	1
	HEAR5	*Heteromeles arbutifolia*	0.3	0.3	1	1
Herbaceous						
	CACH38	*Carpobrotus chilensis*	0.7	0.7	0.2	2
	DISP	*Distichlis spicata*	0.3	0.7	2	2

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

ASSOCIATIONS
Platanus racemosa/Annual Grass

LOCAL VEGETATION DESCRIPTION
Stands of *Platanus racemosa* Woodland and Forest form an open to intermittent tree layer (3-65%, mean 33.8%) at 5-20m tall, a sparse to open shrub layer (7-22%, mean 15.0%) at 0-5m tall, and a sparse to intermittent herbaceous layer (5-60%, mean 26.0%) at 0-1m tall. *Platanus racemosa* dominates or co-dominates in the tree layer. Total vegetation cover is 35-97%, mean 64.8%.

In the *Platanus racemosa* Alliance, *Platanus racemosa* dominates the tree overstory layer. *Quercus agrifolia* and *Salix laevigata,* or *S. lasiolepis* also may be present in low cover, and *Eucalyptus camaldulensis* or *E. globulus* may be invading the overstory. Understory shrubs may include *Baccharis salicifolia* or *Toxicodendron diversilobum*, and understory vines may include *Vitis girdiana. Bromus diandrus* and *Artemisia douglasiana* are usually present in the herbaceous layer.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 324-3463 ft, mean 1860 ft
Aspect: variable
Slope: flat to moderate, range 0-1 degree, mean 1 degree
Topography: flat or concave, bottom slope (occasionally middle slope)
Litter Cover: range 1-94%, mean 61.0%
Rock Cover: range 0.4-2%, mean 1.1%
Bare Ground: range 0.2-94%, mean 34.4%
Parent Material: often Mesozoic granite, occasionally mixed granitic and metamorphic or metamorphic
Soil Texture: coarse to very fine sand, occasionally moderately fine silty clay loam

The *Platanus racemosa* Alliance was sampled primarily in riparian corridors in the Western Granitic Foothills (M262Bn) and Desert Slopes (M262Bp) Subsections along Santa Ysabel Creek, Boden Canyon, and other minor tributaries in the San Dieguito River watershed and San Felipe wash.

Samples used to describe alliance: (n=6) SDRP0194, SDRP0199, SDRP0361, SFVW058, SFVW152, SFVW153

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

GLOBAL DISTRIBUTION
Alliance: foothills of the Sierra Nevada, Central Coast (including Santa Barbara County), South Coast (including Perris Valley and Hills of W Riverside County), Transverse and Peninsular Ranges (including Santa Monica Mountains, San Gabriel Mountains, San Bernardino, Santa Ana Mountains, San Jacinto Mountains, and San Diego County western foothills), Sacramento Valley, western Mojave Desert, Colorado Desert (including Anza-Borrego Desert and San Felipe Valley), Baja California

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

***Platanus racemosa* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	PLRA-t	*Platanus racemosa*	1	16.5	2	63
	EUCAL	*Eucalyptus globulus*	0.3	6.8	1	40
	QUAG-t	*Quercus agrifolia*	0.3	0.7	2	2
Tree Understory						
	SALA3-m	*Salix laevigata*	0.3	1.0	1	5
	QUAG-m	*Quercus agrifolia*	0.3	0.2	0.2	1
Shrub						
	TODI	*Toxicodendron diversilobum*	0.7	4.0	0.2	20
	BASA4	*Baccharis salicifolia*	0.5	3.5	0.2	12
	TAMAR2	*Tamarix*	0.3	1.5	0.2	9
	SAME5	*Sambucus mexicana*	0.3	0.3	1	1
	RUUR	*Rubus ursinus*	0.3	0.1	0.2	0.2
Herbaceous						
	BRDI3	*Bromus diandrus*	0.8	7.2	0.2	25
	ARDO3	*Artemisia douglasiana*	0.3	0.4	0.2	2
	SCCA2	*Scrophularia californica*	0.3	0.3	1	1
	CLPE	*Claytonia perfoliata*	0.3	0.2	0.2	1
	MIGU	*Mimulus guttatus*	0.3	0.2	0.2	1
	URDI	*Urtica dioica*	0.3	0.2	0.2	1

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

ASSOCIATIONS
Platanus racemosa-Populus fremontii/Salix lasiolepis

LOCAL VEGETATION DESCRIPTION
Stands of *Platanus racemosa-Populus fremontii* Woodland and Forest form an open to intermittent tree layer (10-65%, mean 26.3%) at 5-20m tall, a sparse to open shrub layer (5-23%, mean 14.7%) at 0.5-5m tall, and a sparse to intermittent herbaceous layer (1-35%, mean 15%) at 0-2m tall. *Platanus racemosa* and *Populus fremontii* usually co-dominate in the tree layer. Total vegetation cover is 29-78%, mean 46.8%.

In the *Platanus racemosa-Populus fremontii/Salix lasiolepis* Association, *Platanus racemosa* and *Populus fremontii* are usually co-dominant in the overstory tree layer. *Salix laevigata* and *Quercus agrifolia* are often present and usually low in cover. *Salix lasiolepis* is characteristically present in the shrub layer, while *Baccharis salicifolia* and *Toxicodendron diversilobum* are often to usually present. Herbs may include native species such as *Ambrosia psilostachya, Artemisia douglasiana,* and *Typha latifolia* and the non-natives *Bromus diandrus* and *B. madritensis.*

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 1 of 7 surveys of the *Platanus racemosa-Populus fremontii* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 547-2800 ft, mean 1490 ft
Aspect: variable but more often SW
Slope: gentle to moderate, range 1-8 degrees, mean 3.8 degrees
Topography: often concave, occasionally undulating or flat, bottom slopes
Litter Cover: range 35.5-91%, mean 57.6%
Rock Cover: range 2.2-59%, mean 31.1%
Bare Ground: range 0.2-12%, mean 3.6%
Parent Material: alluvium from parent material that is often Mesozoic granite, occasionally gabbro or diorite
Soil Texture: more often sand, occasionally medium to very fine sandy loam or medium silt

The *Platanus racemosa-Populus fremontii* Alliance was sampled in perennial streamcourses and seasonal creekbeds in the Western Granitic Foothills (M262Bn) and Desert Slopes (M262Bp) Subsections, including tributaries in Pamo Canyon of the San Dieguito River watershed and in San Felipe wash.

Samples used to describe alliance: (n=7) SDRP0099, SDRP0141, SDRP0167, SDRP0288, SDRP0295, SDRP0299, SDRP0437

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

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

Platanus racemosa-Populus fremontii/Salix lasiolepis Association: distribution same as alliance

REFERENCES
Holland 1986, Klein and Evens 2005

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

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	POFR2-t	*Populus fremontii*	1.0	10.5	1.0	21.0
	PLRA-t	*Platanus racemosa*	1.0	9.3	3.0	20.0
	SALA3-t	*Salix laevigata*	0.8	3.3	1.0	10
	QUAG-t	*Quercus agrifolia*	0.5	7.7	2.0	35.0
Shrub						
	BASA4	*Baccharis salicifolia*	0.8	4.0	1.0	8.0
	SALA6-m	*Salix lasiolepis*	0.8	2.4	0.2	5.0
	TODI	*Toxicodendron diversilobum*	0.5	2.8	2.0	10.0
	AMFR	*Amorpha fruticosa*	0.3	1.5	4.0	5.0
	ARCA11	*Artemisia californica*	0.3	0.4	0.2	2.0
Herbaceous						
	AMPS	*Ambrosia psilostachya*	0.7	2.4	0.2	8.0
	ARDO3	*Artemisia douglasiana*	0.7	1.2	0.2	4.0
	TYLA	*Typha latifolia*	0.7	0.6	0.2	2.0
	BRMA3	*Bromus madritensis*	0.5	0.2	0.2	1.0
	BRDI3	*Bromus diandrus*	0.3	2.7	1.0	15.0

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

ASSOCIATIONS
Populus fremontii/Baccharis salicifolia
Populus fremontii/Prosopis glandulosa
Populus fremontii-Salix gooddingii/Baccharis salicifolia
Populus fremontii-Salix laevigata

LOCAL VEGETATION DESCRIPTION
Stands of *Populus fremontii* Woodland and Forest form an open to continuous tree layer (4-70%, mean 36.5%) at 5-20m tall. When present, the shrub layer is sparse to intermittent (0-51%, mean 13.5%) at 0-5m tall, and the herbaceous layer is also sparse to intermittent (0.2-47%, mean 21.8%) is at 0-2m tall. *Populus fremontii* dominates or co-dominates with *Salix* spp. in the tree layer, and the trees may be regenerating in the understory. Total vegetation cover is 27-90%, mean 59%.

In the *Populus fremontii/Baccharis salicifolia* Association, *Populus fremontii* dominates the tree layer. *Baccharis salicifolia* is characteristically present and most abundant in the shrub understory, while non-native *Tamarix* sp. may present.

In the *Populus fremontii/Prosopis glandulosa* Association, *Populus fremontii* dominates the tree layer at open cover (sparse on occasion with disturbance from fire). *Prosopis glandulosa* is characteristically present and dominates the shrub layer alone or with other species such as *Chilopsis linearis, Populus fremontii,* or *Salix* sp. The understory may be abundant and include *Bromus, Sisymbrium* and *Typha* spp.

In the *Populus fremontii-Salix gooddingii/Baccharis salicifolia* Association, *Populus fremontii* and *Salix gooddingii* are consistently present in the tree layer, where the species usually co-dominate. *Baccharis salicifolia*, *Salix lasiolepis* and *Toxicodendron diversilobum* are characteristically present in the shrub understory at low cover. *Ambrosia psilostachya* and *Bromus diandrus* are usually present herbs in the understory.

In the *Populus fremontii-Salix laevigata* Association, *Salix laevigata* is consistently present as a co-dominant tree with *Populus fremontii*. A variety of herb species occur across the stands at low cover, including *Anemopsis californica, Eleocharis* sp., *Iris missouriensis*, *Rumex* sp.*, and Stachys albens*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 380-2820 ft, mean 2159 ft
Aspect: often SE, occasionally flat or variable
Slope: flat to gentle, range 0-3 degrees, mean 1.6 degrees
Topography: flat or concave, occasionally undulating; bottom slope, occasionally lower slope
Litter Cover: 15-88%, mean 40.3%
Rock Cover: range 0.0-5%, mean 2.0%
Bare Ground: 7-99%, mean 40.6%
Parent Material: often alluvium and other deposits, occasionally Mesozoic granite
Soil Texture: more often sandy loam or medium silt, occasionally medium loam or coarse loamy sand

Populus fremontii Alliance was sampled in riparian corridors in the Coastal Hills (261Bi), Western Granitic Foothills (M262Bn), and Desert Slopes (M262Bp) Subsections, including tributaries of the San Dieguito River near Lake Hodges and in tributaries of San Felipe wash.

Samples used to describe alliance: (n=10) SDRP0072, SDRP0080, SDRP0109, SDRP0110, SDRP0111, SFVW012, SFVW018, SFVW020, SFVW105, SFVW107

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

GLOBAL DISTRIBUTION
Alliance: inner North Coast and northern Central Coast, foothills of the Klamath and Cascade Ranges, foothills and lower montane Sierra Nevada, Central Valley, Tehachapi Mountains, South Coast, Peninsular and Transverse Ranges (including W Riverside and San Diego Counties), Mojave Desert, Colorado Desert (including Anza-Borrego)

Populus fremontii/Baccharis salicifolia Association: inner South Coast and Peninsular Ranges (including W Riverside and San Diego Counties), Colorado Desert (including San Felipe wash), though full distribution is not known but does include southwestern Utah and southwestern New Mexico
Populus fremontii/Prosopis glandulosa Association: Colorado Desert (including San Felipe wash and Anza-Borrego Desert), though full distribution is not known
Populus fremontii-Salix gooddingii/Baccharis salicifolia Association: inner South Coast and Peninsular Ranges (including W Riverside and San Diego Counties), Colorado Desert (including San Felipe wash), though full distribution is not known but does include southwestern New Mexico and southern Arizona
Populus fremontii-Salix laevigata Association: central and southern Sierra Nevada (foothills and lower montane), Tehachapi Mountains, inner South Coast and Peninsular Ranges (including W Riverside and San Diego Counties), Colorado Desert (including San Felipe wash), though full distribution is not known

REFERENCES
CDFG 1998, CNPS and CDFG 2005a, Klein and Evens 2005, Minnich 1976, NatureServe 2004, Potter 2003, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004, Vaghti 2003

***Populus fremontii* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	POFR2-t	*Populus fremontii*	0.9	23.8	3	50
	SAGO-t	*Salix gooddingii*	0.3	5.3	0.2	35
	SALA3-t	*Salix laevigata*	0.3	5.3	3	25
Tree Understory						
	SALIX-m	*Salix*	0.2	0.7	2	5
	POFR2-m	*Populus fremontii*	0.2	0.4	1	3
Shrub						
	PRGL2	*Prosopis glandulosa*	0.4	2.8	1	22
	BASA4	*Baccharis salicifolia*	0.3	6.6	1	50
	SAME5	*Sambucus mexicana*	0.3	0.7	0.2	5
	ISME5	*Isocoma menziesii*	0.3	0.1	0.2	0.2
Herbaceous						
	BRMA3	*Bromus madritensis*	0.5	1.6	0.2	11
	BRDI3	*Bromus diandrus*	0.4	10.6	15	45
	SISYM	*Sisymbrium*	0.3	2.5	1	20
	URDI	*Urtica dioica*	0.3	0.3	0.2	3
	ANCA10	*Anemopsis californica*	0.3	0.1	0.2	1
	MEPO3	*Medicago polymorpha*	0.2	0.6	2	4
	IRMI	*Iris missouriensis*	0.2	0.3	0.2	3
	ELEOC	*Eleocharis parishii*	0.2	0.0	0.2	0.2
	RUMEX	*Rumex*	0.2	0.0	0.2	0.2
	SCIRP	*Scirpus*	0.2	0.0	0.2	0.2
	SOOL	*Sonchus oleraceus*	0.2	0.0	0.2	0.2
	STAL	*Stachys albens*	0.2	0.0	0.2	0.2

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

ASSOCIATIONS
Pseudotsuga macrocarpa-Quercus agrifolia
Pseudotsuga macrocarpa-Quercus chrysolepis

LOCAL VEGETATION DESCRIPTION
The stand of *Pseudotsuga macrocarpa* Woodland and Forest forms a continuous tree layer (3-75%, mean 31.7%) at 1-20m tall, a sparse to intermittent shrub layer (2-35%, mean 14.7%) at 0.5-2m tall, and a sparse to intermittent herbaceous layer (1-37%, mean 13.7%) at 0-0.5m tall. *Pseudotsuga macrocarpa* dominates or co-dominates with *Quercus* in the tree layer. Total vegetation cover is 8-70%, mean 46.7%.

In the *Pseudotsuga macrocarpa-Quercus agrifolia* Association, *Pseudotsuga macrocarpa* and *Quercus agrifolia* co-dominate. Other conifers, hardwoods, shrubs, and herbs are also present but in low cover (see species table).

In the *Pseudotsuga macrocarpa-Quercus chrysolepis* Association, *Pseudotsuga macrocarpa* and *Quercus chrysolepis* co-dominate, though sometimes the oak can be higher in cover. However, large portion of these stands have burned with recent fire activity (i.e., the Pines Fire of 2002), and the two indicator species may both be low in cover (trees burned to crown), while seral understory species such as *Ceanothus oliganthus* and *Claytonia perfoliata* may be abundant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4693-5184 ft, mean 4991 ft
Aspect: SE, SW
Slope: somewhat steep to steep, range 18-34 degrees, mean 25.7 degrees
Topography: concave to flat, middle of slope
Litter Cover: range 6-60%, mean 33.0%
Rock Cover: range 7-16%, mean 11.5%
Bare Ground: range 22-85%, mean 53.5%
Parent Material: mixed granitic and metamorphic
Soil Texture: medium loam

Pseudotsuga macrocarpa Alliance was sampled in the Palomar - Cuyamaca Peak (M262Bo) Subsection. It is confined to very steep slopes and draws of Volcan Mountain and is found in Santa Ysabel Ranch area on steep north-facing slopes and in slope draws on south-facing slopes. Portions of these stands have been burned (e.g., the Pines Fire of 2002), with some of the *Pseudotsuga macrocarpa* surviving and some almost entirely burned. It is mixed with *Quercus chrysolepis* or *Q. agrifolia,* which may exceed the *Pseudotsuga macrocarpa* in dominance.

Samples used to describe alliance: (n=3) SDRP0213, SFVW143, SFVW149

RANK: G2 S2

GLOBAL DISTRIBUTION
Alliance: montane Central Coast, montane Transverse and Peninsular Ranges (including San Gabriel Mountains, Santa Ana Mountains, San Jacinto Mountains, San Bernardino Mountains, and San Diego: Palomar - Cuyamaca Peak region)

Pseudotsuga macrocarpa-Quercus agrifolia Association: southern Peninsular Ranges (including San Diego County), though full range is not known
Pseudotsuga macrocarpa-Quercus chrysolepis Association: Peninsular Ranges (including San Diego

and W Riverside Counties), though full range is not known

REFERENCES

Cheng 2004, Hanes 1976, Keeler-Wolf 1990, Klein and Evens 2005, Minnich 1976, Sawyer and Keeler-Wolf 1995, Sproul 2001, Vogl 1976

***Pseudotsuga macrocarpa* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	PSMA-t	*Pseudotsuga macrocarpa*	1	15.0	2	40
	QUCH2-t	*Quercus chrysolepis*	0.7	4.7	2	12
	PICO3-t	*Pinus coulteri*	0.7	0.7	0.2	2
	QUAG-t	*Quercus agrifolia*	0.3	10.0	30	30
	QUKE-t	*Quercus kelloggii*	0.3	0.3	1	1
	CADE27-t	*Calocedrus decurrens*	0.3	0.1	0.2	0.2
Tree Understory						
	QUCH2-m	*Quercus chrysolepis*	0.7	1.0	1	2
	PICO3-l	*Pinus coulteri*	0.3	0.3	1	1
	CADE27-l	*Calocedrus decurrens*	0.3	0.1	0.2	0.2
	QUKE-m	*Quercus kelloggii*	0.3	0.1	0.2	0.2
Shrub						
	CEOL	*Ceanothus oliganthus*	0.3	11.7	35	35
	TODI	*Toxicodendron diversilobum*	0.3	2.0	6	6
	SAAP2	*Salvia apiana*	0.3	0.3	1	1
	ERCO25	*Eriophyllum confertiflorum*	0.3	0.1	0.2	0.2
	LOSU2	*Lonicera subspicata*	0.3	0.1	0.2	0.2
	QUWIF	*Quercus wislizeni* var. *frutescens*	0.3	0.1	0.2	0.2
	RIRO	*Ribes roezlii*	0.3	0.1	0.2	0.2
Herbaceous						
	BRMA3	*Bromus madritensis*	1	0.8	0.2	2
	CLPE	*Claytonia perfoliata*	0.7	8.1	0.2	24
	BRDI3	*Bromus diandrus*	0.7	0.1	0.2	0.2
	CLEX2	*Claytonia exigua*	0.3	1.7	5	5
	ERCI6	*Erodium cicutarium*	0.3	0.7	2	2
	LONE4	*Lotus nevadensis*	0.3	0.3	1	1
	BRTE	*Bromus tectorum*	0.3	0.1	0.2	0.2
	FESTU	*Festuca*	0.3	0.1	0.2	0.2
	GAAN2	*Galium angustifolium*	0.3	0.1	0.2	0.2
	HIIN3	*Hirschfeldia incana*	0.3	0.1	0.2	0.2
	LASE	*Lactuca serriola*	0.3	0.1	0.2	0.2
	LOST4	*Lotus strigosus*	0.3	0.1	0.2	0.2
	MEIM	*Melica imperfecta*	0.3	0.1	0.2	0.2
	POIM	*Polystichum imbricans*	0.3	0.1	0.2	0.2

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

ASSOCIATIONS
Quercus agrifolia/Annual Grass-Herb
Quercus agrifolia/Coastal Sage Scrub *(Artemisia californica-Rhamnus crocea-Keckiella antirrhinoides)*
Quercus agrifolia/Toxicodendron diversilobum Riparian
Quercus agrifolia/Toxicodendron diversilobum/Grass
Quercus agrifolia-Platanus racemosa/Toxicodendron diversilobum
Quercus agrifolia-Quercus engelmannii/Eriogonum fasciculatum/Annual Grass-Herb
Quercus agrifolia-Quercus kelloggii (Peninsular Range)

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus agrifolia* Woodland and Forest form a sparse to continuous tree layer (4-80%, mean 38.8%) at 2-35m tall. When present, the shrub layer is sparse to intermittent (0-60%, mean 15.4%) at 0.5-5m tall. The herbaceous layer, when present is sparse to continuous (0-80%, mean 30.0%) at 0-1m tall. *Quercus agrifolia* usually dominates in the tree layer. Total vegetation cover is 20-95%, mean 69.1%.

In the *Quercus agrifolia*/Annual Grass-Herb Association, *Quercus agrifolia* is dominant in the overstory, and a variety of grasses and forbs occupy the open to intermittent herb layer, the most common being native *Claytonia* spp. and *Lupinus bicolor* and non-native grasses *Bromus madritensis, B. hordeaceus*, and *Vulpia myuros.*

In the *Quercus agrifolia*/Coastal Sage Scrub Association, a variety of coastal sage scrub (e.g., *Artemisia californica, Eriogonum fasciculatum, Malosma laurina, Rhamnus ilicifolia, R. crocea,* and *Salvia apiana*) intermix in the understory while *Quercus agrifolia* is dominant in the overstory.

In the *Quercus agrifolia/Toxicodendron diversilobum* Riparian Association, *Salix laevigata, S. lasiolepis, and Quercus engelmannii* are infrequently to often present at low cover. *Toxicodendron diversilobum* is characteristically present and usually dominant in the shrub understory. Herbs may include *Carex* sp., *Agrostis* sp., and *Bromus diandrus.*

In the *Quercus agrifolia/Toxicodendron diversilobum*/Grass Association, *Quercus agrifolia* is dominant in the overstory. In the open shrub layer, *Toxicodendron diversilobum* is consistently present, while *Rhamnus ilicifolia*, *Mimulus aurantiacus*, and *Lonicera subspicata* are often to occasionally present. A variety of herbs occur in the understory at similar or higher cover than the shrub layer, including native species such as *Galium angustifolium, Marah macrocarpus,* and *Nassella pulchra* and non-native species *Bromus diandrus* and *B. hordeaceus*.

In the *Quercus agrifolia-Platanus racemosa/Toxicodendron diversilobum* Association, *Platanus racemosa* is consistently present and is usually sub-dominant or sometimes co-dominant with *Quercus agrifolia*. Other tree species (e.g., *Populus fremontii, P. balsamifera, Salix laevigata,*) may occur as sub-dominants. *Toxicodendron diversilobum* is characteristically present in the shrub layer, and *Vitis girdiana* is a characteristically present woody vine. Herbs may include *Juncus* sp., *Avena barbata,* and *Bromus diandrus.*

In the *Quercus agrifolia-Quercus engelmannii/Eriogonum fasciculatum*/Annual Grass-Herb Association, *Quercus agrifolia* is dominant in the tree overstory, and *Q. engelmannii* is characteristically present. *Eriogonum fasciculatum* is dominant in the shrub overstory, and a variety of herbs occur at similar cover to the overstory, including native *Crypthantha intermedia, Galium aparine,* and *Gutierrezia sarothrae* and non-native species *Bromus diandrus* and *B. madritensis*.

In the *Quercus agrifolia-Quercus kelloggii* (Peninsular Range) Association, *Quercus kelloggii* is sub-

dominant to co-dominant with *Q. agrifolia* in the tree overstory, and *Pinus coulteri* is often present at low cover. The shrub understory is diverse and can include *Toxicodendron diversilobum, Salvia apiana, Arctostaphylos glandulosa, Lonicera subspicata, Prunus virginiana, Rosa californica, Rhus trilobata,* and *Symphoricarpos mollis.* The herb understory is also diverse and can include *Galium aparine, Dichelostemma capitatum, Elymus glaucus, Bromus diandrus, B. madritensis,* and *B. hordeaceus.*

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 9 of 33 surveys of the *Quercus agrifolia* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 241-4178 ft, mean 2052 ft
Aspect: variable but more often NE
Slope: gentle to steep, range 1-33 degrees, mean 14.4 degrees
Topography: variable but more often concave; bottom to upper
Litter Cover: range 35-94%, mean 72.5%
Rock Cover: range 0.4-45%, mean 11.4%
Bare Ground: range 0-41%, mean 10.8%
Parent Material: more often Mesozoic granite or mixed granitic and metamorphic, occasionally alluvium and other deposits, metamorphic or gabbro or diorite or Mesozoic granite
Soil Texture: usually loams, occasionally coarse to fine loamy sand

Quercus agrifolia Alliance was sampled in all but the western-most subsection of the study area: Coastal Hills (261Bi), Western Granitic Foothills (M262Bn), Palomar - Cuyamaca Peak (M262Bo), and Desert Slopes (M262Bp). It was sampled commonly on a variety of topographic and geologic settings.

Samples used to describe alliance: (n=33) SDRP0005, SDRP0014, SDRP0026, SDRP0028, SDRP0035, SDRP0052, SDRP0069, SDRP0071, SDRP0082, SDRP0085, SDRP0100, SDRP0106, SDRP0107, SDRP0134, SDRP0183, SDRP0187, SDRP0189, SDRP0191, SDRP0196, SDRP0222, SDRP0268, SDRP0292, SDRP0323, SDRP0352, SDRP0408, SDRP0433, SDRP0436, SDRP0445, SDRP0482, SDRP0484, SDRP0486, SFVW005, SFVW017

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

GLOBAL DISTRIBUTION
Alliance: North to South Coast (including Sonoma to San Diego and W Riverside Counties), Central Valley (including Suisun Marsh), Transverse and Peninsular Ranges (including Ventura, Los Angeles, W Riverside and San Diego Counties), Colorado Desert (including Anza-Borrego Desert), and Baja California

Quercus agrifolia/Annual Grass-Herb Association: Central Coast (Solano to Monterey County), and South Coast (Ventura to San Diego and W Riverside Counties)
Quercus agrifolia/Coastal Sage Scrub/Grass Association: Central to South Coast (including Santa Clara to San Diego Counties)
Quercus agrifolia/*Toxicodendron diversilobum* Riparian Association: South Coast and Peninsular Ranges (including San Diego and W Riverside Counties), though full distribution not known
Quercus agrifolia/Toxicodendron diversilobum/Grass Association: Central Coast (San Francisco Bay Area to Monterey County) to the South Coast to the Peninsular Ranges (including Ventura, Los Angeles, W Riverside, and San Diego Counties)
Quercus agrifolia-Platanus racemosa/Toxicodendron diversilobum Association: South Coast and Peninsular Ranges (including W Riverside and San Diego Counties), though full distribution is not known
Quercus agrifolia-Quercus engelmannii/Eriogonum fasciculatum/Annual Grass-Herb Association: interior South Coast, Peninsular Ranges, and Colorado Desert (San Diego County), though full distribution is not known. Some of these stands may contain the eastern most localities of *Quercus engelmannii* in semi desert alluvial fans in San Felipe Valley.

Quercus agrifolia-Quercus kelloggii Association: Peninsular Ranges (including western foothills of San Diego County), though full distribution is not known

REFERENCES

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

***Quercus agrifolia* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	QUAG-t	*Quercus agrifolia*	1	32.6	4	80
	QUEN-t	*Quercus engelmannii*	0.3	0.7	0.2	8
	PLRA-t	*Platanus racemosa*	0.2	1.2	0.2	15
	QUKE-t	*Quercus kelloggii*	0.2	2.2	0.2	15
Shrub						
	TODI	*Toxicodendron diversilobum*	0.7	2.5	0.2	15
	ERFA2	*Eriogonum fasciculatum*	0.5	3.5	0.2	23
	SAAP2	*Salvia apiana*	0.4	0.6	0.2	7
	RHIL	*Rhamnus ilicifolia*	0.3	1.5	0.2	38
	ARCA11	*Artemisia californica*	0.2	0.8	0.2	10
	MIAU	*Mimulus aurantiacus*	0.2	0.3	0.2	5
Herbaceous						
	BRDI3	*Bromus diandrus*	0.9	14.3	0.2	65
	BRMA3	*Bromus madritensis*	0.5	4.6	0.2	25
	BRHO2	*Bromus hordeaceus*	0.4	1.5	0.2	15
	GAAP2	*Galium aparine*	0.3	0.5	0.2	5
	AVBA	*Avena barbata*	0.3	0.3	0.2	5

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

ASSOCIATIONS
Quercus chrysolepis
Quercus chrysolepis-Pseudotsuga macrocarpa

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus chrysolepis* Woodland and Forest form a continuous tree layer (87-100%, mean 95.5%), a sparse shrub layer (0-0.2%, mean 0.1%), and a sparse herbaceous layer (1-5%, mean 3%) at 0-0.5m tall. *Quercus chrysolepis* dominates in the tree layer and is regenerating in the understory. Total vegetation cover is 80-95%, mean 87.5%.

In the *Quercus chrysolepis* Association, *Quercus chrysolepis* is dominant while other oak and conifer species also may present, including *Q. kelloggii, Calocedrus decurrens,* and *Pinus coulteri*. The herbaceous layer is sparse and includes native and non-native species (see species table).

In the *Quercus chrysolepis-Pseudotsuga macrocarpa* Association, *Quercus chrysolepis* is dominant while *Pseudotsuga macrocarpa* is present at as a scattered emergent conifer overstory. Other oak and conifer species may present, including *Q. kelloggii, Abies concolor, Calocedrus decurrens,* and *Pinus coulteri*. Reconnaissance surveys principally substantiate this association.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4960-5337 ft, mean 5149 ft
Aspect: SW
Slope: somewhat steep, range 15-24 degrees, mean 19.5 degrees
Topography: undulating or convex
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed granitic and metamorphic
Soil Texture: no data

The *Quercus chrysolepis* Alliance was sampled only on Volcan Mountain in the Palomar - Cuyamaca Peak (M262Bo) Subsection, on exposed and somewhat steep south-facing slopes.

Samples used to describe alliance: (n=2) SDRP0204, SDRP0217

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

GLOBAL DISTRIBUTION
Alliance: outer North Coast, montane North Coast and Central Coast (including Los Padres National Forest), Klamath Ranges, montane Cascade Range, montane Sierra Nevada, montane Transverse and Peninsular Ranges (including W Riverside County, San Jacinto Mountains, San Bernardino Mountains), Anza-Borrego Desert, Baja California

Quercus chrysolepis Association: Transverse and Peninsular Ranges (including montane San Bernardino Mountains, W Riverside and San Diego Counties), and potentially across the range of the alliance
Quercus chrysolepis-Pseudotsuga macrocarpa Association: Peninsular Ranges (Western Riverside County, San Diego County, and San Bernardino Mountains) though full distribution is not known

REFERENCES
Borchert et al. 2004, CDFG 1998, CNPS and CDFG 2005a, Gordon and White 1994, Holland 1986,

Keeler-Wolf 1990, Klein and Evens 2005, Meier 1979, Minnich 1976, Potter 2003, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004, Vogl 1976

***Quercus chrysolepis* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	QUCH2-t	*Quercus chrysolepis*	1	78.5	65	92
	QUKE-t	*Quercus kelloggii*	1	8.5	5	12
	CADE27-t	*Calocedrus decurrens*	1	4.5	4	5
	PICO3-t	*Pinus coulteri*	0.5	4	8	8
Tree Understory						
	QUCH2-l	*Quercus chrysolepis*	1	0.2	0.2	0.2
	CADE27-m	*Calocedrus decurrens*	0.5	2	4	4
Shrub						
	TODI	*Toxicodendron diversilobum*	0.5	0.1	0.2	0.2
	BRDI3	*Bromus diandrus*	1	1.1	0.2	2
	ELGL	*Elymus glaucus*	0.5	0.1	0.2	0.2
	PTDR	*Pterostegia drymarioides*	0.5	0.1	0.2	0.2
	GAAP2	*Galium aparine*	0.5	0.1	0.2	0.2
	BRMA3	*Bromus madritensis*	0.5	0.1	0.2	0.2
Cryptogam						
	MOSS	Moss	1	0.6	0.2	1
	LICHEN	Lichen	0.5	0.5	1	1

***Quercus engelmannii* Alliance (Engelmann Oak)**

ASSOCIATIONS
Quercus engelmannii/Adenostoma fasciculatum-Arctostaphylos glauca
Quercus engelmannii/Annual Grass-Herb
Quercus engelmannii/Quercus berberidifolia
Quercus engelmannii/Salvia apiana/Grass-Herb
Quercus engelmannii-Quercus agrifolia/Artemisia californica
Quercus engelmannii-Quercus agrifolia/Chaparral *(Adenostoma fasciculatum-Quercus berberidifolia-Rhamnus ilicifolia)*
Quercus engelmannii-Quercus agrifolia/Toxicodendron diversilobum/Annual Grass-Herb

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus engelmannii* Woodland and Forest form a sparse to continuous tree layer (3-70%, mean 21.4%) at 5-15m tall. When present, the shrub layer is sparse to continuous (0-78%, mean 28.4%) at 0.5-10m tall. The herbaceous layer, when present, is sparse to continuous (0-95%, mean 37%) at 0-2m tall. *Quercus engelmannii* dominate or co-dominate in the tree layer. Total vegetation cover is 30-95%, mean 72.5%.

In the *Quercus engelmannii/Adenostoma fasciculatum-Arctostaphylos glauca* Association, *Quercus engelmannii* is dominant in the overstory. A variety of shrubs co-dominate in the understory and include *Adenostoma fasciculatum, Arctostaphylos glauca, Q. berberidifolia,* and *Salvia apiana.*

In the *Quercus engelmannii*/Annual Grass-Herb Association, *Quercus engelmannii* is dominant in the overstory. Shrubs occur at sparse cover. Herbs dominate the understory and may include non-natives *Bromus diandrus, B. madritensis*, *Avena barbata* and natives *Achillea* millefolium and *Dichelostemma capitatum.*

In the *Quercus engelmannii/Quercus berberidifolia* Association, *Quercus engelmannii* is dominant in the overstory, and *Q. berberidifolia* is dominant in the understory. Other shrubs may be present in lower cover, such as *Adenostoma fasciculatum, Arctostaphylos pungens,* and *Ceanothus greggii.* The herbaceous layer is usually sparse.

In the *Quercus engelmannii/Salvia apiana/*Grass-herb Association, *Quercus engelmannii* is dominant in the overstory, and *Salvia apiana* is dominant in the understory. The herbaceous layer is usually similar in cover to the shrub layer, and may include non-natives *Avena barbata, Bromus diandrus, B. hordeaceus,* and *B. madritensis* and natives *Galium angustifolium* and *Melica imperfecta.*

In the *Quercus engelmannii-Quercus agrifolia/Artemisia californica* Association, both tree species are consistently present and usually co-dominant in the overstory. In the shrub understory, *Artemisia californica* is dominant or co-dominant with other shrubs, including *Salvia apiana* and *Eriogonum fasciculatum.* The herbaceous layer is sparse.

*Quercus engelmannii-Quercus agrifolia/*Chaparral Association, both tree species are consistently present and usually co-dominant in the overstory. In the understory, a variety of chaparral species occur and co-dominate, which may include *Adenostoma fasciculatum, Quercus berberidifolia, Rhamnus ilicifolia, Arctostaphylos glandulosa, Salvia apiana,* and *Ceanothus leucodermis.*

In the *Quercus engelmannii-Quercus agrifolia/Toxicodendron diversilobum*/Annual Grass-Herb Association, both tree species are consistently present and usually co-dominant in the overstory. The open shrub understory consists of characteristically present *Toxicodendron diversilobum.* Understory herbs include a variety of non-native and native species, including *Bromus diandrus, Avena fatua*,

Erodium sp., *Nassella pulchra,* and *Lupinus bicolor.*

The main overstory tree, *Quercus engelmannii,* is ranked as a CNPS List 4 species (CNPS 2005). See Appendix 3 for more information on this plant. No other rare plants were observed in the stands.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 690-4108 ft, mean 2498 ft
Aspect: variable, but more often north-trending
Slope: flat to steep, range 0-40 degrees, mean 17.0 degrees
Topography: variable but more often undulating or convex; bottom to upper slopes or ridge tops
Litter Cover: range 30-95%, mean 65.5%
Rock Cover: range 0-58%, mean 17.,7%
Bare Ground: range 0.2-52%, mean 11.8%
Parent Material: more often Mesozoic granite, occasionally mixed granitic and metamorphic, gabbro or diorite or Mesozoic granite, metamorphic, or schist
Soil Texture: more often medium to very fine sandy loam, occasionally other loam, or sand mixture

The *Quercus engelmannii* Alliance was sampled in the Western Granitic Foothills (M262Bn) and Palomar - Cuyamaca Peak (M262Bo) Subsection, including Pamo Canyon and Santa Ysabel Ranch, and the Desert Slopes (M262Bp) in the San Felipe wash area. It occurred on a variety of slopes and rocky areas.

Samples used to describe alliance: (n=31) SDRP0020, SDRP0022, SDRP0024, SDRP0025, SDRP0027, SDRP0042, SDRP0043, SDRP0153, SDRP0168, SDRP0175, SDRP0178, SDRP0182, SDRP0291, SDRP0298, SDRP0313, SDRP0347, SDRP0351, SDRP0416, SDRP0418, SDRP0442, SDRP0444, SDRP0447, SDRP0461, SDRP0474, SDRP0476, SDRP0478, SDRP0485, SDRP0489, SDRP0490, SDRP0491, SFVW045

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

GLOBAL DISTRIBUTION
Alliance: western Peninsular Ranges (including W Riverside County: Santa Rosa Plateau/Santa Ana Mountains and foothills of San Jacinto Mountains; San Diego County: Palomar - Cuyamaca Peak region and western foothills), South Coast (Los Angeles to Riverside County), Desert Slopes (San Diego County), to the Channel Islands and Baja California

Quercus engelmannii/Adenostoma fasciculatum-Arctostaphylos glauca Association: Peninsular Ranges (San Diego County), though full distribution is not known
*Quercus engelmannii/*Annual Grass-Herb: Peninsular Ranges (San Diego County), though full distribution is not known
Quercus engelmannii/Quercus berberidifolia Association: Peninsular Ranges (including W Riverside and San Diego Counties) and Desert Slopes (San Diego County). Some of these stands may contain the eastern most localities of *Q. engelmannii* in semi desert alluvial fans in San Felipe Valley.
*Quercus engelmannii/Salvia apiana/*Grass-Herb Association: Peninsular Ranges (San Diego County), though full distribution is not known
Quercus engelmannii-Quercus agrifolia/Artemisia californica Association: Peninsular Ranges (including W Riverside and San Diego Counties)
*Quercus engelmannii-Quercus agrifolia/*Chaparral Association: Peninsular Ranges (San Diego County), though full distribution is not known
*Quercus engelmannii-Quercus agrifolia/Toxicodendron diversilobum/*Annual Grass-Herb Association: Peninsular Ranges (including W Riverside and San Diego Counties)

REFERENCES
Beauchamp 1986, Boyd et al. 1995, Klein and Evens 2005, Reiser 2001, Sawyer and Keeler-Wolf 1995

***Quercus engelmannii* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	QUEN-t	*Quercus engelmannii*	0.9	11.4	2	44
	QUAG-t	*Quercus agrifolia*	0.7	8.0	1	40
Shrub						
	TODI	*Toxicodendron diversilobum*	0.5	2.2	0.2	20
	RHIL	*Rhamnus ilicifolia*	0.5	1.7	0.2	8
	SAAP2	*Salvia apiana*	0.5	4.0	0.2	30
	ADFA	*Adenostoma fasciculatum*	0.5	4.0	0.2	60
	MIAU	*Mimulus aurantiacus*	0.4	0.9	0.2	6
	QUBE5	*Quercus berberidifolia*	0.4	4.2	1	44
	ERFA2	*Eriogonum fasciculatum*	0.4	1.0	0.2	6
	ARGL4	*Arctostaphylos glauca*	0.3	6.6	0.2	62
	LOSU2	*Lonicera subspicata*	0.3	0.4	0.2	5
	ARCA11	*Artemisia californica*	0.2	2.1	0.2	27
Herbaceous						
	BRDI3	*Bromus diandrus*	0.7	17.4	0.2	95
	BRMA3	*Bromus madritensis*	0.5	1.1	0.2	6
	BRHO2	*Bromus hordeaceus*	0.4	2.7	1	15
	AVBA	*Avena barbata*	0.4	1.6	0.2	18
	MEIM	*Melica imperfecta*	0.3	1.0	0.2	18

***Quercus kelloggii* Alliance (Black Oak)**

ASSOCIATIONS
Quercus kelloggii/Annual Grass-Herb
Quercus kelloggii-Calocedrus decurrens
Quercus kelloggii-Quercus chrysolepis

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus kelloggii* Woodland and Forest form an open to continuous tree layer (5-85%, mean 43.2%) at 5-20m tall, a sparse to continuous shrub layer (0.2-70%, mean 19.5%) at 1-2m tall, and a sparse to continuous herbaceous layer (1-70%, mean 23%) at 0-1m tall. *Quercus kelloggii* dominate or co-dominate in the tree layer and are occasionally regenerating in the herbaceous layer. Total vegetation cover is 54-95%, mean 72.4%.

In the *Quercus kelloggii*/Annual Grass-Herb Association, *Quercus kelloggii* is dominant in the overstory. Non-native species, particularly *Bromus diandrus,* are dominant in the herbaceous layer, while a variety of native species also occur including *Claytonia* spp. and *Calochortus* sp.

In the *Quercus kelloggii-Calocedrus decurrens* Association, *Quercus kelloggii* is dominant or co-dominant with *Calocedrus decurrens*. Both trees are usually regenerating. *Quercus chrysolepis* sometimes may be co-dominant. *Toxicodendron diversilobum* and *Ribes roezlii* are characteristically present in the shrub layer at low cover.

In the *Quercus kelloggii-Quercus chrysolepis* Association, *Quercus kelloggii* and *Quercus chrysolepis* are co-dominant in the tree layer. *Arctostaphylos* sp. or *Symphoricarpos mollis* may be abundant in the shrub layer.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3937-5125 ft, mean 4659 ft
Aspect: usually NE or NW, rarely SW
Slope: somewhat steep to steep, range 15-30 degrees, mean 22.9 degrees
Topography: often convex, occasionally concave or undulating, middle to upper slope
Litter Cover: range 75-95%, mean 85%
Rock Cover: range 0.4-0.4%, mean 0.4%
Bare Ground: range 0.2-25%, mean 12.6%
Parent Material: mixed granitic and metamorphic
Soil Texture: medium to very fine sandy loam

The *Quercus kelloggii* Alliance was sampled only in the Palomar - Cuyamaca Peak (M262Bo) Subsection. It occurs from the Santa Ysabel Ranch area to Volcan Mountain, usually on moister slopes (more often north-facing) and at the slope bottoms at margins of meadows/grasslands. Many of the stands survived the Pines Fire of 2002 with minor damage.

Samples used to describe alliance: (n=7) SDRP0012, SDRP0177, SDRP0202, SDRP0209, SDRP0227, SDRP0229, SFVW131

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

GLOBAL DISTRIBUTION
Alliance: North and Central Coast, Klamath Ranges, Cascade Range, Sierra Nevada, montane Transverse and Peninsular Ranges (including W Riverside County, San Jacinto and San Bernardino Mountains), Anza-Borrego Desert

Quercus kelloggii/Grass Association: Transverse Ranges (Kern and San Bernardino Counties), Peninsular Ranges (San Diego County), and the Coast Range from Monterey to Napa County
Quercus chrysolepis-Quercus kelloggii Association: Northern Sierra Nevada (Shasta to Tuolumne Counties), North and Central Coast (Mendocino and Santa Cruz Counties), Peninsular Ranges (San Diego County)
Quercus kelloggii-Calocedrus decurrens Association: central Sierra Nevada (including Yosemite), Peninsular Ranges (W Riverside and San Diego County), though full distribution is not known

REFERENCES

Allen et al. 1989, Allen et al. 1991, Keeler-Wolf 1987, Keeler-Wolf 1990, Klein and Evens 2005, Minnich 1976, NatureServe et al. 2003b, CDFG 1998, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Quercus kelloggii* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	QUKE-t	*Quercus kelloggii*	1	28.9	5	55
	QUCH2-t	*Quercus chrysolepis*	0.4	7.9	15	20
	CADE27-t	*Calocedrus decurrens*	0.3	2.4	7	10
	QUAG-t	*Quercus agrifolia*	0.3	0.2	0.2	1
Tree Understory						
	CADE27-m	*Calocedrus decurrens*	0.3	4.3	7	23
Shrub						
	TODI	*Toxicodendron diversilobum*	0.6	4.3	0.2	15
	ARPR	*Arctostaphylos (pringlei)*	0.4	9.5	0.2	65
	SYMO	*Symphoricarpos mollis*	0.4	3.0	0.2	20
	RIRO	*Ribes roezlii*	0.4	1.9	0.2	12
Herbaceous						
	BRDI3	*Bromus diandrus*	0.9	16.5	0.2	47
	BRTE	*Bromus tectorum*	0.6	2.2	0.2	12
	OSBR	*Osmorhiza brachypoda*	0.4	2.2	0.2	15
	GAAN2	*Galium angustifolium*	0.4	0.3	0.2	1
	BRMA3	*Bromus madritensis*	0.4	0.1	0.2	0.2
	ELGL	*Elymus glaucus*	0.4	0.1	0.2	0.2
	STME2	*Stellaria media*	0.3	0.2	0.2	1
	TRWI3	*Trifolium willdenovii*	0.3	0.2	0.2	1
	ACMI2	*Achillea millefolium*	0.3	0.1	0.2	0.2
	BLCR	*Bloomeria crocea*	0.3	0.1	0.2	0.2
	BRHO2	*Bromus hordeaceus*	0.3	0.1	0.2	0.2
	CLPE	*Claytonia perfoliata*	0.3	0.1	0.2	0.2
	GAAP2	*Galium aparine*	0.3	0.1	0.2	0.2
Epiphyte						
	PHVI9	*Phoradendron villosum*	0.4	0.2	0.2	1

***Salix gooddingii* Alliance (Black Willow)**

ASSOCIATIONS
Salix gooddingii/Baccharis salicifolia
Salix gooddingii/Lepidium latifolium
Salix gooddingii-Salix laevigata

LOCAL VEGETATION DESCRIPTION
Stands of *Salix gooddingii* Woodland and Forest form an open to continuous tree layer (15-80%, mean 35.8%) at 2-15m tall, a sparse to intermittent shrub layer (0.2-35%, mean 19.5%) at 0.5-10m tall, and a sparse to intermittent herbaceous layer (2-54%, mean 24.7%) at 0-2m tall. *Salix gooddingii* dominates or co-dominates in the tree layer, and it may be regenerating in the understory shrub/tree layer as well. Total vegetation cover is 32-95%, mean 70.2%.

In the *Salix gooddingii/Baccharis salicifolia* Association, *Salix gooddingii* dominates in the overstory tree layer, while *Baccharis salicifolia* is characteristically present and dominant in the shrub layer. *S. gooddingii* may also be present and regenerating in the shrub layer. The herbaceous understory may be present at low to moderate cover, including *Arundo donax* and *Scirpus californicus.*

In the *Salix gooddingii/Lepidium latifolium* Association, *Salix gooddingii* dominates in the overstory or co-dominates with *Tamarix* sp. in tree layer. The shrub layer is open and may include *Baccharis salicifolia* and *Isocoma menziesii. S. gooddingii* may also be present and regenerating in the shrub layer. The herb layer is dominated by non-native species *Lepidium latifolium,* while native species such as *Distichlis spicata* and *Heliotropium curassavicum* may be present.

In the *Salix gooddingii-Salix laevigata* Association, *Salix gooddingii* and *Salix laevigata* are co-dominant in the tree layer. A variety of shrubs and herbs may occur in the understory at low cover, including *Baccharis salicifolia*, *Isocoma menziesii Juncus* sp*., Gnaphalium* sp., and *Typha* sp*.*

Iva hayesiana, a CNPS List 2 species (CNPS 2005), was found in 1 of 10 surveys of the *Salix gooddingii* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 91-2808 ft, mean 542 ft
Aspect: variable (including flat/none)
Slope: flat to gentle, range 0-5 degrees, mean 1.9 degrees
Topography: often flat, occasionally concave; bottom to lower slope
Litter Cover: range 6-94%, mean 72.4%
Rock Cover: range 0-1%, mean 0.5%
Bare Ground: range 0.2-25%, mean 7.2%
Parent Material: often Mesozoic granite, occasionally alluvium and other deposits or sandstone
Soil Texture: loamy sand or sandy loam, occasionally clay

The *Salix gooddingii* Alliance was sampled in intermittently and seasonally flooded habitats in the Coastal Hills (261Bi), Western Granitic Foothills (M262Bn), and the Desert Slopes (M262Bp) Subsections, especially in riparian corridors feeding into and out of Lake Hodges, along Lake Hodges, in lower tributaries of the San Dieguito River such as Lusardi Creek, and in the San Felipe wash area.

Samples used to describe alliance: (n=10) SDRP0077, SDRP0086, SDRP0095, SDRP0238, SDRP0239, SDRP0240, SDRP0245, SDRP0317, SDRP0322, SFVW106

RANK: G1 S1, G2 S1, G2 S2, G3 S2, and G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: inner North Coast, Cascade Range foothills, Central to South Coast (including Point Reyes), Central Valley, Sierra Nevada foothills, Peninsular Ranges, Mojave Desert, Colorado Desert

Salix gooddingii/Baccharis salicifolia Association: South Coast and Peninsular Ranges (W Riverside and San Diego Counties), Colorado Desert (San Diego County), though full distribution is not known
Salix gooddingii/Lepidium latifolium Association: South Coast Peninsular Ranges (W Riverside and San Diego Counties), though full distribution is not known
Salix gooddingii-Salix laevigata Association: Peninsular Ranges (San Diego County), though full distribution is not known

REFERENCES
Klein and Evens 2005, NatureServe et al. 2003a, Sawyer and Keeler-Wolf 1995

***Salix gooddingii* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	SAGO-t	*Salix gooddingii*	1	25.6	7	85
	SALA3-t	*Salix laevigata*	0.4	4.0	1	35
	POFR2-t	*Populus fremontii*	0.2	0.1	0.2	1
Tree Understory						
	SAGO-m	*Salix gooddingii*	0.2	4.5	3	42
	SALA3-m	*Salix laevigata*	0.2	0.0	0.2	0.2
Shrub						
	BASA4	*Baccharis salicifolia*	1	8.3	0.2	30
	TAMAR2	*Tamarix*	0.7	5.3	0.2	30
	LELA2	*Lepidium latifolium*	0.5	8.9	0.2	59
	ISME5	*Isocoma menziesii*	0.3	1.4	1	10
	SAME5	*Sambucus mexicana*	0.2	0.4	2	2
	BAPI	*Baccharis pilularis*	0.2	0.3	0.2	3
	BASA2	*Baccharis sarothroides*	0.2	0.3	1	2
Herbaceous						
	DISP	*Distichlis spicata*	0.5	2.6	0.2	20
	HECU3	*Heliotropium curassavicum*	0.4	2.2	0.2	20
	HIIN3	*Hirschfeldia incana*	0.4	0.5	0.2	3
	SCCA	*Scirpus californicus*	0.3	3.1	7	15
	AMPS	*Ambrosia psilostachya*	0.3	0.6	0.2	6
	ARDO4	*Arundo donax*	0.3	0.5	0.2	3
	ANCA10	*Anemopsis californica*	0.3	0.1	0.2	1
	TYLA	*Typha latifolia*	0.2	0.5	0.2	5
	BRASS2	*Brassica nigra*	0.2	0.2	0.2	2
	COMA2	*Conium maculatum*	0.2	0.1	0.2	1
	APGR2	*Apium graveolens*	0.2	0.0	0.2	0.2
	COSE4	*Cortaderia selloana*	0.2	0.0	0.2	0.2
	JUNCU	*Juncus*	0.2	0.0	0.2	0.2
	PLOD	*Pluchea odorata*	0.2	0.0	0.2	0.2
	XAST	*Xanthium strumarium*	0.2	0.0	0.2	0.2

***Salix laevigata* Alliance (Red Willow)**

ASSOCIATIONS
Salix laevigata/Salix lasiolepis/Artemisia douglasiana

LOCAL VEGETATION DESCRIPTION
Stands of *Salix laevigata* Woodland and Forest form a continuous tree layer (68-90%, mean 75.3%) at 5-10m tall, a sparse to open shrub layer (2-27%, mean 15.7%) at 0-5m tall, and a sparse to continuous herbaceous layer (2-75%, mean 30.7%) at 0-0.5m tall. *Salix laevigata* dominates or co-dominates in the tree layer, and it is often regenerating in the understory shrub/tree layer. Total vegetation cover is 70-90%, mean 81.7%.

In the *Salix laevigata/Salix lasiolepis/Artemisia douglasiana* Association, *Salix laevigata* occurs as a tree overstory dominant, and *S. lasiolepis* occurs as a tree overstory co-dominant (especially in mature stands) or as a shrub understory dominant. Other trees that infrequently occur at low cover include *Platanus racemosa, Populus fremontii,* and *Quercus agrifolia.* All tree species in this association may be found regenerating in the understory. Other common understory shrubs include *Baccharis salicifolia*, *Rubus ursinus,* and *Amorpha fruticosa.* A wide variety of herb species occupy the understory, with *Artemisia douglasiana* characteristically present. Other herbs often occurring include *Mimulus guttatus, Ambrosia psilostachya, Bromus diandrus, B. hordeaceus, Hirschfeldia incana, Lolium multiflorum,* and *Urtica dioica.*

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 2840-2923 ft, mean 2869 ft
Aspect: often SW, occasionally flat
Slope: flat to gentle, range 0-3 degrees, mean 1.7 degrees
Topography: often concave, occasionally flat
Litter Cover: 52%, mean 52% (from one plot)
Rock Cover: 0.4%, mean 0.4% (from one plot)
Bare Ground: 40%, mean 40% (from one plot)
Parent Material: often mixed granitic and metamorphic, occasionally metamorphic
Soil Texture: sand

Salix laevigata Alliance was sampled in intermittently and seasonally flooded habitats in the Western Granitic Foothills (M262Bn) Subsection including riparian corridors of Santa Ysabel Creek and Pamo Canyon.

Samples used to describe alliance: (n=3) SDRP0039, SDRP0041, SDRP0053, SDRP0459, SDRP0488

RANK: G1 S1, G3 S2, and 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, Los Angeles, W Riverside, and San Diego Counties)

REFERENCES
CNPS and CDFG 2005b, Klein and Evens 2005, NatureServe et al. 2003a, NatureServe et al. 2003b, Potter 2003, Sawyer and Keeler-Wolf 1995, Vogl 1976

***Salix laevigata* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	SALA3-t	*Salix laevigata*	1	50.3	18	68
	PLRA-t	*Platanus racemosa*	0.7	1.7	0.2	5
	QUAG-t	*Quercus agrifolia*	0.3	1	3	3
Tree Understory						
	SALA6-t	*Salix lasiolepis*	0.7	26	28	50
Shrub						
	RUUR	*Rubus ursinus*	0.7	2	1	5
	SYMO	*Symphoricarpos mollis*	0.7	1.7	0.2	5
	AMFR	*Amorpha fruticosa*	0.7	1.7	0.2	5
	ROCA2	*Rosa californica*	0.7	1.7	1	4
	TODI	*Toxicodendron diversilobum*	0.7	0.7	1	1
	MEIN2	*Melilotus indicus*	0.3	5	15	15
	SALA6-m	*Salix lasiolepis*	0.3	0.7	2	2
Herbaceous						
	ARDO3	*Artemisia douglasiana*	1	8.7	4	18
	URDI	*Urtica dioica*	1	3.3	1	5
	BRDI3	*Bromus diandrus*	1	2.7	0.2	5
	BRHO2	*Bromus hordeaceus*	1	1.5	0.2	4
	HIIN3	*Hirschfeldia incana*	0.7	3.3	5	5
	RUCR	*Rumex crispus*	0.7	0.7	0.2	2
	BRMA3	*Bromus madritensis*	0.7	0.7	0.2	2
	XAST	*Xanthium strumarium*	0.7	0.7	0.2	2
	RUDI2	*Rubus discolor*	0.7	0.4	0.2	1
	LOMU	*Lolium multiflorum*	0.7	0.4	0.2	1
	JUEFP	*Juncus effusus* var. *pacificus*	0.7	0.1	0.2	0.2
	MAVU	*Marrubium vulgare*	0.7	0.1	0.2	0.2
	SCBA	*Schismus barbatus*	0.3	6.7	20	20
	TRHI4	*Trifolium hirtum*	0.3	5	15	15
	VUMY	*Vulpia myuros*	0.3	0.7	2	2

Acacia greggii Alliance (Catclaw Acacia)

ASSOCIATIONS
Acacia greggii/Annual Grass-Herb

LOCAL VEGETATION DESCRIPTION
Acacia greggii Shrubland forms an open shrub layer (1-31%, mean 10.7%), where *Acacia greggii* dominates. Shrubs are 1-5m tall. The tree layer is sparse (0-1%, mean 1%), and the herbaceous layer is open to continuous (14-82%, mean 45.4%) at 0-0.5m tall. Total vegetation cover is 15.0-85%, mean 53.8%.

In the *Acacia greggii*/Annual Grass-Herb association, *Acacia greggii* is the dominant shrub while other shrubs including *Eriogonum fasciculatum*, and *Ziziphus parryi* and cacti *Opuntia acanthocarpa* may be present and usually lower cover than the *Acacia*. Non-native species such as *Bromus madritensis* and *Erodium cicutarium* are usually abundant in the herb layer, while native speices such as *Lupinus bicolor, Phacelia distans, Amsinckia menziesii* var. *intermedia,* and *Lupinus concinnus* may also be present and abundant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 2413-2996 ft, mean 2570 ft
Aspect: variable or flat/none
Slope: gentle to moderate, range 0-7 degrees, mean 3.8 degrees
Topography: variable but often undulating; lower to middle slope
Litter Cover: 1.0-15%, mean 5.0%
Rock Cover: range 1.0-70%, mean 15.8%
Bare Ground: range 5.0-95%, mean 61.7%
Parent Material: alluvium and other deposits
Soil Texture: usually medium to very fine sandy loam or coarse to fine sand, rarely coarse loamy sand

The *Acacia greggii* Alliance was sampled only within San Felipe Valley in the Desert Slopes (M262Bp) Subsection on alluvial slopes above the main riparian wash.

Samples used to describe alliance: (n=23) SDRP0120, SFVW021, SFVW027, SFVW028, SFVW030, SFVW040, SFVW049, SFVW060, SFVW075, SFVW077, SFVW082, SFVW084, SFVW086, SFVW087, SFVW088, SFVW097, SFVW110, SFVW114, SFVW115, SFVW117, SFVW124, SFVW125, SFVW127

RANK: G3 S2 and G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Mojave Desert, Colorado Desert (including Anza-Borrego Desert), Baja California

REFERENCES
CDFG 1998, Keeler-Wolf et al. 2004, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004

***Acacia greggii* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	ACGR	*Acacia greggii*	1	6.7	0.2	30
	OPAC	*Opuntia acanthocarpa*	0.7	0.8	0.2	7
	ERFA2	*Eriogonum fasciculatum*	0.6	0.2	0.2	1
	ZIPA	*Ziziphus parryi*	0.3	0.5	0.2	4
	PRFR	*Prunus fremontii*	0.3	0.3	0.2	3
	GUSA2	*Gutierrezia sarothrae*	0.3	0.2	0.2	2
	JUCA7	*Juniperus californica*	0.3	0.2	0.2	3
	OPCH	*Opuntia chlorotica*	0.2	0.3	0.2	3
Herbaceous						
	ERCI6	*Erodium cicutarium*	1	14.9	1	55
	BRMA3	*Bromus madritensis*	0.9	17.3	2	50
	LUBI	*Lupinus bicolor*	0.5	6.4	0.2	30
	PHDI	*Phacelia distans*	0.5	0.5	0.2	5
	AMMEI2	*Amsinckia menziesii* var. *intermedia*	0.4	0.5	0.2	4
	SCHIS	*Schismus*	0.3	1.1	0.2	7
	PLAR	*Plagiobothrys arizonicus*	0.3	0.1	0.2	1
	LUCO	*Lupinus concinnus*	0.2	0.6	0.2	11
	CAEX14	*Castilleja exserta*	0.2	0.0	0.2	0.2

***Adenostoma fasciculatum* Alliance (Chamise)**

ASSOCIATIONS
Adenostoma fasciculatum (pure)
Adenostoma fasciculatum (disturbance)

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum* Shrubland form an open to continuous shrub layer (25-82%, mean 51.8%) at 0.5-5m tall, where *Adenostoma fasciculatum* dominates. The herbaceous layer is sparse to intermittent (0.2-40%, mean 7.7%) at 0-0.5m tall. Occasionally, trees occur as emergents (2-8% cover, mean 5%). Total vegetation cover is 26-90%, mean 54.3%.

In the *Adenostoma fasciculatum* pure Association, *Adenostoma fasciculatum* is the dominant shrub species. Other shrubs such as *Yucca whipplei* and *Salvia apiana* are present in less than 5% cover. The herb layer is sparse with *Bromus madritensis, Avena barbata, Erodium cicutarium,* and *Lotus* spp. as the most consistent.

In the *Adenostoma fasciculatum* (disturbance) Association, *Adenostoma fasciculatum* is the dominant shrub while other disturbance-following species occur as sub-dominants such as *Lotus scoparius, Dendromecon rigida, Trichostema parishii, Helianthemum scoparium,* and *Isocoma menziesii.* The understory is diverse and includes *Bromus madritensis, Cryptantha* sp., *Lupinus* spp., *Lotus strigosus, Salvia columbariae,* and *Dicentra chrysantha.*

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 2 of 11 surveys of the *Adenostoma fasciculatum* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2077-4006 ft, mean 3037 ft
Aspect: variable
Slope: moderate to somewhat steep, 7-32 degrees, mean 18.5 degrees
Topography: often undulating and occasionally convex; lower to middle slopes
Litter Cover: range 1-85%, mean 20.1%
Rock Cover: range 1-77%, mean 27.1%
Bare Ground: range 9-93%, mean 55.5%
Parent Material: mixed granitic and metamorphic, alluvium and other deposits, and Mesozoic granite
Soil Texture: medium to very fine sandy loam and moderately fine sandy clay loam

The *Adenostoma fasciculatum* Alliance was sampled in the Western Granitic Foothills (M262Bn), Palomar - Cuyamaca Peak (M262Bo), and Desert Slopes (M262Bp) Subsections. It was found across all aspects of lower to middle slopes at low-mid elevations.

Samples used to describe alliance: (n=11) SDRP0002, SDRP0044, SDRP0051, SDRP0113, SDRP0114, SDRP0315, SFVW016, SFVW032, SFVW056, SFVW092, SFVW095

RANK: G3 S3 and 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, Los Padres National Forest), Klamath foothills, Sierra Nevada foothills, montane Sierra Nevada (including Yosemite), Southern California (including San Gabriel, Santa Ana, San Jacinto, and San Bernardino Mountains, W Riverside County), 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 (including Ventura to San Diego County), Transverse and Peninsular Ranges (including Ventura to San Diego County)
Adenostoma fasciculatum (disturbance) Association: South Coast (including Ventura to San Diego County), Peninsular Ranges (W Riverside to San Diego County), Colorado Desert (San Diego County)

REFERENCES

Borchert et al. 2004, Boyd et al. 1995, CDFG 1998, CNPS and CDFG 2005b, CNPS and CDFG 2005a, Ertter and Bowerman 2002, Evens and San 2004, Gordon and White 1994, Hanes 1976, Keeler-Wolf 1990, Klein and Evens 2005, Kruckeberg 1984, Minnich 1976, NatureServe et al. 2003a, NatureServe et al. 2003b, Sawyer and Keeler-Wolf 1995, Sharsmith 1982, Shuford and Timossi 1989, Vogl 1976

***Adenostoma fasciculatum* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	ADFA	*Adenostoma fasciculatum*	1	31.1	8	80
	YUWH	*Yucca whipplei*	0.8	0.4	0.2	1
	RHOV	*Rhus ovata*	0.6	0.8	0.2	3
	LOSC2	*Lotus scoparius*	0.5	2.1	0.2	11
	SAAP2	*Salvia apiana*	0.5	0.3	0.2	2
	CEGR	*Ceanothus greggii*	0.4	0.1	0.2	0.2
	QUBE5	*Quercus berberidifolia*	0.3	0.7	0.2	5
	DERI	*Dendromecon rigida*	0.3	0.3	0.2	2
	GUSA2	*Gutierrezia sarothrae*	0.3	0.1	0.2	1
	TRPA3	*Trichostema parishii*	0.3	0.1	0.2	0.2
Herbaceous						
	BRMA3	*Bromus madritensis*	0.7	5.1	0.2	30
	ERCI6	*Erodium cicutarium*	0.5	0.9	0.2	6
	CRYPT	*Cryptantha*	0.5	0.4	0.2	3
	LOST4	*Lotus strigosus*	0.3	0.4	0.2	4
	SACO6	*Salvia columbariae*	0.3	0.2	0.2	1
	DICA14	*Dichelostemma capitatum*	0.3	0.1	0.2	0.2
	PEMU	*Pellaea mucronata*	0.3	0.1	0.2	0.2

***Adenostoma fasciculatum-Arctostaphylos glandulosa* Alliance (Chamise - Eastwood Manzanita)**

ASSOCIATIONS
Adenostoma fasciculatum-Arctostaphylos glandulosa-Quercus berberidifolia

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum-Arctostaphylos glandulosa* Shrubland form an open to intermittent shrub layer (8-45%, mean 25.8%), where *Adenostoma fasciculatum* co-dominates with *Arctostaphylos glandulosa*. Shrubs often occur in two different strata, with low shrubs at 0-2m tall and tall shrubs at 0.5-5m tall. The herbaceous layer is sparse (0.2-7%, mean 2,3%) at 0-0.5m tall. Trees occur as sparse emergents (0-0.2% cover, mean 0.2%) at 5-10m tall. Total vegetation cover is 11-45%, mean 26.3%.

In the *Adenostoma fasciculatum-Arctostaphylos glandulosa-Quercus berberidifolia* Association, *Adenostoma fasciculatum* is co-dominant with *Arctostaphylos glandulosa,* and *Quercus berberidifolia* is characteristically sub-dominant. Other understory shrubs may be present, including *Rhus ovata, Salvia apiana*, *Helianthemum scoparium,* and *Gutierrezia sarothrae.* The herbaceous layer is very sparse.

Hulsea californica, a CNPS List 1B species, was found in 1 of the 4 surveys of the *Adenostoma fasciculatum-Arctostaphylos glandulosa* Alliance, in the mid montane zone of Volcan Mountain. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 1816-5071 ft, mean 3330 ft
Aspect: often NE, occasionally SE or variable
Slope: gentle to steep, range 4-30 degrees, mean 16.3 degrees
Topography: often undulating and occasionally convex, lower to upper slopes
Litter Cover: range 1-67%, mean 37.9%
Rock Cover: range 3-39%, mean 14.8%
Bare Ground: range 20-89%, mean 49.8%
Parent Material: mixed granitic and metamorphic, metamorphic, and Mesozoic granite
Soil Texture: often medium to very fine sandy loam, occasionally medium silt loam

The *Adenostoma fasciculatum-Arctostaphylos glandulosa* Alliance was sampled in the Western Granitic Foothills (M262Bn) and Palomar - Cuyamaca Peak (M262Bo) Subsections on northerly or neutral slopes in mountainous terrain from Pamo Valley east to Volcan Mountain.

Samples used to describe alliance: (n=4) SDRP0174, SDRP0301, SDRP0346, SFVW141

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

GLOBAL DISTRIBUTION
Alliance: North to South Coast (including Mendocino National Forest, Los Padres National Forest, and Santa Monica Mountains), Transverse and Peninsular Ranges (including Santa Monica, San Bernardino, and San Jacinto Mountains south to the western foothills and Palomar - Cuyamaca Peak regions of San Diego County), Anza-Borrego Desert

Adenostoma fasciculatum-Arctostaphylos glandulosa-Quercus berberidifolia Association: Peninsular Ranges (including foothills and mountains of W Riverside and San Diego Counties), though full distribution is not known

REFERENCES
Borchert et al. 2004, CDFG 1998, CNPS and CDFG 2005b, Gordon and White 1994, Keeler-Wolf 1990,

Klein and Evens 2005, Parker 1990, Sawyer and Keeler-Wolf 1995, Vogl 1976

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

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	PICO3-t	*Pinus coulteri*	0.25	0.1	0.2	0.2
Tree Understory						
	QUCH2-m	*Quercus chrysolepis*	0.25	0.1	0.2	0.2
Shrub						
	ADFA	*Adenostoma fasciculatum*	1	15.8	1	35
	ARGL3	*Arctostaphylos glandulosa*	1	5.3	3	10
	QUBE5	*Quercus berberidifolia*	0.75	3.0	3	6
	GUSA2	*Gutierrezia sarothrae*	0.5	0.8	1	2
	SAAP2	*Salvia apiana*	0.5	0.6	0.2	2
	HESC2	*Helianthemum*	0.25	2.5	10	10
	SNAG	Standing snag	0.25	1.3	5	5
	RHOV	*Rhus ovata*	0.25	0.5	2	2
	SACL	*Salvia clevelandii*	0.25	0.5	2	2
	XYBI	*Xylococcus bicolor*	0.25	0.5	2	2
	YUWH	*Yucca whipplei*	0.25	0.5	2	2
	CEBE3	*Cercocarpus betuloides*	0.25	0.3	1	1
	CEGR	*Ceanothus greggii*	0.25	0.3	1	1
	CELE2	*Ceanothus leucodermis*	0.25	0.3	1	1
	MIAU	*Mimulus aurantiacus*	0.25	0.3	1	1
	QUWIF	*Quercus wislizeni* var. *frutescens*	0.25	0.3	1	1
	TODI	*Toxicodendron diversilobum*	0.25	0.3	1	1
	LOSU2	*Lonicera subspicata*	0.25	0.1	0.2	0.2
	RHCR	*Rhamnus crocea*	0.25	0.1	0.2	0.2
	RHIL	*Rhamnus ilicifolia*	0.25	0.1	0.2	0.2
	SYMO	*Symphoricarpos mollis*	0.25	0.1	0.2	0.2
Herbaceous						
	CRYPT	*Cryptantha*	0.5	0.1	0.2	0.2
	CHAEN	*Chaenactis*	0.25	0.8	3	3
	BRTE	*Bromus tectorum*	0.25	0.5	2	2
	HUCA	*Hulsea californica*	0.25	0.1	0.2	0.2
	TRLA3	*Trichostema lanatum*	0.25	0.1	0.2	0.2

***Adenostoma fasciculatum-Arctostaphylos glauca* Alliance (Chamise - Bigberry Manzanita)**

ASSOCIATIONS
Adenostoma fasciculatum-Arctostaphylos glauca
Adenostoma fasciculatum-Arctostaphylos glauca-Quercus berberidifolia

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum-Arctostaphylos glauca* Shrubland form an intermittent to continuous shrub layer (38-80%, mean 64.2%), where *Adenostoma fasciculatum* co-dominant with *Arctostaphylos glauca*. Shrubs often occur in two different strata, with low shrubs at 1-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is sparse to open (1-22%, mean 10%) at 0-0.5m tall, with a variety of native and non native species (see species table). Trees occasionally occur as emergents (0.2-3% cover, mean 1.4%) at 5-10m tall, including *Quercus engelmannii*. Total vegetation cover is 45-83%, mean 71%.

In the *Adenostoma fasciculatum-Arctostaphylos glauca* Association, *Adenostoma fasciculatum* and *Arctostaphylos glauca* are co-dominant in the shrub canopy with relatively low cover of other shrub species.

In the *Adenostoma fasciculatum-Arctostaphylos glauca-Quercus berberidifolia* Association, *Quercus berberidifolia* is at least sub-dominant or co-dominant with *Adenostoma fasciculatum* and *Arctostaphylos glauca.*

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 6 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 2117-3135 ft, mean 2592 ft
Aspect: variable but often NW
Slope: gentle to somewhat steep, range 5-24 degrees, mean 14.2 degrees
Topography: often undulating but occasionally concave, convex or flat, lower to upper slopes and occasionally benches
Litter Cover: range 25-80%, mean 49.6%
Rock Cover: range 10-55%, mean 21.9%
Bare Ground: range 5-48%, mean 24.2%
Parent Material: Mesozoic granite and mixed granitic and metamorphic, rarely metamorphic
Soil Texture: more often moderately coarse sandy loam, can also be medium to very fine sandy loam, moderately fine sandy clay loam, or moderately fine clay loam

The *Adenostoma fasciculatum-Arctostaphylos glauca* Alliance was sampled only within the Western Granitic Foothills (M262Bn) Subsection, on variable slopes in the Lake Sutherland area.

Samples used to describe alliance: (n=10) SDRP0406, SDRP0407, SDRP0409, SDRP0413, SDRP0414, SDRP0415, SDRP0417, SDRP0450, SDRP0457, SDRP0460

RANK: G1 S1, G3 S3, and 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 W Riverside: San Gorgonio and San Jacinto Mountains and Foothills; San Diego County: western foothills), and potentially north to the Central Coast
Adenostoma fasciculatum-Arctostaphylos glauca-Quercus berberidifolia Association: Transverse Ranges, Peninsular Ranges (including San Diego County: western foothills), and potentially north to the Central Coast

REFERENCES

Borchert et al. 2004, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San 2004, Gordon and White 1994, Klein and Evens 2005, Sawyer and Keeler-Wolf 1995

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

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	QUEN-t	*Quercus engelmannii*	0.5	0.6	0.2	3
Shrub						
	ADFA	*Adenostoma fasciculatum*	1	32.2	10	65
	ARGL4	*Arctostaphylos glauca*	1	18.6	1	48
	QUBE5	*Quercus berberidifolia*	0.9	13.6	1	36
	SAAP2	*Salvia apiana*	0.5	0.4	0.2	2
	LOSU2	*Lonicera subspicata*	0.5	0.3	0.2	1
	YUWH	*Yucca whipplei*	0.4	0.2	0.2	1
	RHIL	*Rhamnus ilicifolia*	0.3	0.1	0.2	1
	CELE2	*Ceanothus leucodermis*	0.2	0.4	1	3
Herbaceous						
	BRMA3	*Bromus madritensis*	0.5	2.3	1	14
	FIGA	*Filago gallica*	0.4	0.9	2	3
	CAMIS	*Camissonia hirtella*	0.4	0.2	0.2	1
	CAMIS	*Camissonia strigulosa*	0.4	0.2	0.2	1
	CAMIS	*Camissonia californica*	0.4	0.2	0.2	1
	CAMIS	*Camissonia bistorta*	0.4	0.2	0.2	1
	CAMIS	*Camissonia*	0.4	0.2	0.2	1
	MAMA8	*Marah macrocarpus*	0.3	1	0.2	6
	CRYPT	*Cryptantha*	0.3	0.2	0.2	1
	PTDR	*Pterostegia drymarioides*	0.2	1.2	2	10
	CRMU2	*Cryptantha muricata*	0.2	0.7	3	4
	CRIN8	*Cryptantha intermedia*	0.2	0.4	2	2
	BRHO2	*Bromus hordeaceus*	0.2	0.3	1	2
	TRPA3	*Trichostema parishii*	0.2	0.2	1	1
	PHPA3	*Phacelia parryi*	0.2	0.2	1	1
	PLAGI	*Plagiobothrys*	0.2	0.1	0.2	1

***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 open to intermittent shrub layer (5-50%, mean 31.6%), where *Adenostoma fasciculatum* and *Ceanothus greggii* co-dominate. Shrubs often occur in two different strata, with low shrubs at 1-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is sparse to open (5-30%, mean 18.3%) at 0-0.5m tall, and trees are sparse emergents (1-1%, mean 1%) Total vegetation cover is 22-65%, mean 46.1%.

In the *Adenostoma fasciculatum-Ceanothus greggii* Association, *Adenostoma fasciculatum* and *Ceanothus greggii* are co-dominant shrubs, and other species such as *Rhus ovata* or *Quercus berberidifolia* may be present but usually at lower cover. Herbaceous species including natives *Marah macrocarpus, Navarretia hamata,* and *Camissonia,* and non-natives *Bromus madritensis, Bromus diandrus, Bromus hordeaceus,* and *Avena barbata* occurred in the stands sampled.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 2682-3176 ft, mean 2919 ft
Aspect: often NE or NW, sometimes Flat or SW
Slope: flat to somewhat steep, range 0-28 degrees, mean 13.1 degrees
Topography: often convex or undulating, and occasionally flat; middle slope to ridge top
Litter Cover: range 1-65%, mean 19.2%
Rock Cover: range 5.2-44%, mean 23.9%
Bare Ground: range 10-71%, mean 43.3%
Parent Material: often mixed granitic and metamorphic and occasionally alluvium and other deposits
Soil Texture: often medium to very fine sandy loam or moderately coarse to fine loamy sand, occasionally moderately fine clay loam

The *Adenostoma fasciculatum-Ceanothus greggii* Alliance was sampled in the Western Granitic Foothills (M262Bn) and Desert Slopes (M262Bp) Subsections in desert transition along exposed slopes near Lake Sutherland and in San Felipe Valley.

Samples used to describe alliance: (n=7) SDRP0115, SDRP0458, SDRP0499, SFVW085, SFVW089, SFVW093, SFVW111

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

GLOBAL DISTRIBUTION
Alliance: Central Coast, montane Transverse and Peninsular Ranges (including San Bernardino Mountains, W Riverside and San Diego Counties), Anza-Borrego Desert, Baja California

Adenostoma fasciculatum-Ceanothus greggii Association: Transverse Ranges (San Bernardino Mountains), Peninsular Ranges (including southern W Riverside County: San Jacinto Mountains, and south to San Diego County: western foothills), Anza Borrego Desert and San Felipe Valley desert slopes

REFERENCES
CDFG 1998, Gordon and White 1994, Klein and Evens 2005, Sawyer and Keeler-Wolf 1995

***Adenostoma fasciculatum-Ceanothus greggii* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	ADFA	*Adenostoma fasciculatum*	1	14.9	1	30
	CEGR	*Ceanothus greggii*	0.9	8.4	2	15
	RHOV	*Rhus ovata*	0.7	3.3	0.2	20
	LOSC2	*Lotus scoparius*	0.7	0.4	0.2	1
	MADE	*Malacothamnus densiflorus*	0.6	0.9	0.2	5
	ERFA2	*Eriogonum fasciculatum*	0.6	0.2	0.2	1
	QUBE5	*Quercus berberidifolia*	0.4	2.3	2	10
	ARGL4	*Arctostaphylos glauca*	0.4	0.3	0.2	2
	PRIL	*Prunus ilicifolia*	0.4	0.2	0.2	1
	DERI	*Dendromecon rigida*	0.4	0.1	0.2	0.2
	SAME5	*Sambucus mexicana*	0.4	0.1	0.2	0.2
	TRPA3	*Trichostema parishii*	0.3	0.1	0.2	0.2
	YUWH	*Yucca whipplei*	0.3	0.1	0.2	0.2
Herbaceous						
	BRMA3	*Bromus madritensis*	0.9	8.7	1	20
	ERCI6	*Erodium cicutarium*	0.4	2.0	0.2	13
	MAMA8	*Marah macrocarpus*	0.4	0.5	0.2	3
	BRDI3	*Bromus diandrus*	0.4	0.5	0.2	2
	NAHA2	*Navarretia hamata*	0.3	2.4	8	9
	CAMIS	*Camissonia*	0.3	0.6	1	3
	CLPE	*Claytonia perfoliata*	0.3	0.2	0.2	1
	PACA2	*Paeonia californica*	0.3	0.2	0.2	1
	AVBA	*Avena barbata*	0.3	0.1	0.2	0.2
	BRHO2	*Bromus hordeaceus*	0.3	0.1	0.2	0.2

***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 open to intermittent shrub layer (22-65%, mean 43.9%), where *Adenostoma fasciculatum* is dominant or co-dominates, as *Salvia apiana* and *Artemisia californica* are characteristically present to co-dominant. Shrubs usually occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is sparse to intermittent (0.2-60%, mean 21.4%) at 0-1m tall. Trees rarely occur as emergents (1% cover, mean 1%) at 5-10m tall. Total vegetation cover is 32-85%, mean 57%.

In the *Adenostoma fasciculatum-Salvia apiana-Artemisia californica* Association, *Adenostoma fasciculatum* is dominant to co-dominant with coastal sage species, *Salvia apiana* and *Artemisia californica* (though *A. californica* may be higher in cover than *S. apiana,* and vice versa). Non-native species such as *Bromus madritensis* and *Avena barbata* are common in the herb layer.

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 2 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 1316-2460 ft, mean 1863 ft
Aspect: variable
Slope: gentle to steep, range 2-28 degrees, mean 18.2 degrees
Topography: more often undulating, but can be convex, flat or concave, lower slope to ridge top
Litter Cover: range 10-69%, mean 40.5%
Rock Cover: range 0.4-50%, mean 23.4%
Bare Ground: range 2-55%, mean 31%
Parent Material: more often gabbro or diorite or Mesozoic granite, rarely metamorphic
Soil Texture: often medium to very fine loamy sand but can also be moderately fine sandy clay loam or moderately fine clay loam

Adenostoma fasciculatum-Salvia apiana Alliance was sampled only within the Western Granitic Foothills (M262Bn) Subsection, including the Pamo Valley area east towards Santa Ysabel Ranch.

Samples used to describe alliance: (n=11) SDRP0152, SDRP0289, SDRP0296, SDRP0297, SDRP0300, SDRP0303, SDRP0348, SDRP0360, SDRP0443, SDRP0449, SDRP0487

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: widely distributed in the Transverse and Peninsular Ranges (including W Riverside and San Diego Counties)

Adenostoma fasciculatum-Salvia apiana-Artemisia californica Association: Peninsular Ranges (including W Riverside: southern Santa Ana Mountains, San Diego County: western foothills)

REFERENCES
Klein and Evens 2005, Sawyer and Keeler-Wolf 1995

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

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	ADFA	*Adenostoma fasciculatum*	1	21	11	50
	SAAP2	*Salvia apiana*	1	5.6	1	18
	ARCA11	*Artemisia californica*	0.9	12.5	2	30
	YUWH	*Yucca whipplei*	0.6	1.1	0.2	6
	ERFA2	*Eriogonum fasciculatum*	0.5	1	0.2	4
	MIAU	*Mimulus aurantiacus*	0.5	1.1	0.2	8
	XYBI	*Xylococcus bicolor*	0.5	0.3	0.2	2
	RHOV	*Rhus ovata*	0.4	1.4	0.2	10
	RHIL	*Rhamnus ilicifolia*	0.3	0.7	0.2	6
	MALA6	*Malosma laurina*	0.3	0.4	0.2	2
Herbaceous						
	BRMA3	*Bromus madritensis*	0.7	4.4	0.2	18
	AVBA	*Avena barbata*	0.5	0.2	0.2	1
	PTDR	*Pterostegia drymarioides*	0.4	8.3	3	40
	MAMA8	*Marah macrocarpus*	0.4	0.6	0.2	3
	CAMIS	*Camissonia*	0.3	1.1	1	10
	CAMIS	*Camissonia strigulosa*	0.3	1.1	1	10
	CAMIS	*Camissonia hirtella*	0.3	1.1	1	10
	CAMIS	*Camissonia californica*	0.3	1.1	1	10
	CAMIS	*Camissonia bistorta*	0.3	1.1	1	10
	HIIN3	*Hirschfeldia incana*	0.3	0.7	0.2	7
	BRHO2	*Bromus hordeaceus*	0.3	0.6	0.2	4

***Adenostoma fasciculatum-Xylococcus bicolor* Alliance (Chamise - Mission Manzanita)**

ASSOCIATIONS
Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus crassifolius-Rhus ovata
Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus verrucosus
Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum
Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum-Eriogonum fasciculatum
Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum-Salvia mellifera-Rhus integrifolia
Adenostoma fasciculatum-Xylococcus bicolor-Salvia mellifera-Malosma laurina

LOCAL VEGETATION DESCRIPTION
Stands of *Adenostoma fasciculatum-Xylococcus bicolor* Shrubland form a sparse to continuous shrub layer (0.2-84%, mean 46.7%), *Adenostoma fasciculatum* may be co-dominant with or have more than two times the cover of *Xylococcus bicolor* (which is a characteristic indicator species of this alliance). Shrubs often occur in two different strata, with low shrubs at 0-2m tall and tall shrubs at 0.5-5m tall. The herbaceous layer is non-existent to intermittent (0-65%, mean 10.5%) at 0-1m tall. Trees occasionally occur as emergents (0.2-3% cover, mean 1.5%) at 1-20m tall, such as *Quercus agrifolia* or *Q. engelmannii.* Total vegetation cover is 5-92%, mean 53.1%.

In the *Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus verrucosus* Association, *Ceanothus verrucosus* is characteristically present and sometimes co-dominant with the other two shrubs (*A. fasciculatum* and *X. bicolor)*.

In the *Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus crassifolius-Rhus ovata* Association, there are a mixture of shrubs in the overstory, whereby *Ceanothus crassifolius, C. oliganthus, Malosma laurina, Rhus ovata,* and *Salvia mellifera* are usually present and sometimes co-dominant with the other two shrubs. This association has evidence of repeatable with fire, where the abundance of *C. crassifolius* may vary with time since fire.

Similarly, in the *Adenostoma fasciculatum-Xylococcus bicolor-Salvia mellifera-Malosma laurina* Association, *Salvia mellifera* and *Malosma laurina* together are co-dominant with the other two shrubs.

In the *Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum* Association, there is a characteristic presence to co-dominance of *Cneoridium dumosum* with the other two main shrubs. The understory is usually high in cover and may include *Pterostegia drymarioides, Cryptantha* spp., and *Filago* spp.

Similar to this association is the *Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum-Eriogonum fasciculatum* Association; however, *Eriogonum fasciculatum* is also present and usually similar in cover to *C. dumosum.*

Also similar is the *Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum-Salvia mellifera-Rhus integrifolia* Association, with characteristic presence and sometimes co-dominance of *Salvia mellifera, Rhus integrifolia, Malosma laurina,* and *Artemisia californica* with the other two main shrubs.

Eight different rare plants were found in the 76 surveys of the *Adenostoma fasciculatum-Xylococcus bicolor* Alliance with the listings by CNPS (2005) provided. *Arctostaphylos glandulosa* subsp. *crassifolia*, a CNPS List 1B species, was found in 3 surveys. *Adolphia californica*, a CNPS List 2 species, was found in 1 survey. *Comarostaphylis diversifolia* subsp. *diversifolia*, a CNPS List 1B species, was found in 1 survey. *Ceanothus verrucosus*, a CNPS List 2 species, was found in 13 surveys. *Ferocactus viridescens*, a CNPS List 2 species, was found in 2 surveys. *Pentachaeta aurea*, a CNPS List 4 species, was found in 1 survey. *Quercus dumosa*, a CNPS List 1B species, was found in 9 surveys. *Quercus*

engelmannii, a CNPS List 4 species, was found in 6 surveys. See Appendix 3 for more information on these plants.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 181-4410 ft, mean 1162 ft
Aspect: variable
Slope: flat to steep, range 0-39 degrees, mean 17.8 degrees
Topography: mostly undulating but can be concave, convex and rarely flat, lower slope to ridge top
Litter Cover: range 0-93%, mean 48.2%
Rock Cover: range 0.4-51%, mean 13.7%
Bare Ground: range 0.2-95%, mean 33.4%
Parent Material: mostly Mesozoic granite, but can also occur on sandstone, gabbro and diorite, alluvium and other deposits, metavolcanic, or metamorphic
Soil Texture: more often sandy loams, occasionally clay loams, loams or sands

The *Adenostoma fasciculatum-Xylococcus bicolor* Alliance was sampled from the far-west to middle portions of the study area in the Coastal Terraces (261Bj), Coastal Hills (261Bi), and Western Granitic Foothills (M262Bn) Subsections. It is unique to San Diego and W Riverside Counties on lower to upper slopes from the coast to inland foothills.

Samples used to describe alliance: (n=76) SDRP0054, SDRP0058, SDRP0060, SDRP0126, SDRP0127, SDRP0143, SDRP0144, SDRP0145, SDRP0147, SDRP0149, SDRP0154, SDRP0156, SDRP0157, SDRP0158, SDRP0159, SDRP0160, SDRP0169, SDRP0232, SDRP0234, SDRP0249, SDRP0250, SDRP0255, SDRP0264, SDRP0265, SDRP0266, SDRP0267, SDRP0274, SDRP0279, SDRP0281, SDRP0282, SDRP0285, SDRP0286, SDRP0294, SDRP0304, SDRP0305, SDRP0306, SDRP0314, SDRP0325, SDRP0326, SDRP0327, SDRP0328, SDRP0330, SDRP0331, SDRP0333, SDRP0335, SDRP0356, SDRP0419, SDRP0420, SDRP0422, SDRP0424, SDRP0426, SDRP0428, SDRP0430, SDRP0431, SDRP0432, SDRP0434, SDRP0435, SDRP0439, SDRP0440, SDRP0451, SDRP0452, SDRP0453, SDRP0454, SDRP0455, SDRP0468, SDRP0469, SDRP0470, SDRP0472, SDRP0473, SDRP0475, SDRP0481, SDRP0492, SDRP0493, SDRP0494, SDRP0496, SDRP0497

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

GLOBAL DISTRIBUTION
Alliance: South Coast (including San Diego County coastal terraces and coastal hills) to the Peninsular Ranges (including W Riverside-Santa Ana Mountains south to San Diego County: western foothills)

Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus crassifolius-Rhus ovata Association: southern Peninsular Ranges (western foothills of San Diego County)
Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus verrucosus Association: southern Peninsular Ranges (coastal terraces, coastal hills, and western foothills of San Diego County)
Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum Association: southern Peninsular Ranges (coastal hills to western foothills of San Diego County)
Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum-Eriogonum fasciculatum Association: southern Peninsular Ranges (coastal terraces and western foothills of San Diego County)
Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum-Salvia mellifera-Rhus integrifolia Association: southern Peninsular Ranges (coastal hills and coastal terraces of San Diego County)
Adenostoma fasciculatum-Xylococcus bicolor-Salvia mellifera-Malosma laurina Association: Peninsular Ranges (W Riverside County: Santa Ana Mtns. and San Diego County: coastal hills and foothills)

REFERENCES

Gordon and White 1994, Holland 1986, Klein and Evens 2005, Rivas-Martinez 1997, CNPS unpublished transect data (1993-1995)

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

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	ADFA	*Adenostoma fasciculatum*	1	19.1	0.2	60
	XYBI	*Xylococcus bicolor*	1	10.3	0.2	72
	SAME3	*Salvia mellifera*	0.8	4	0.2	19
	MALA6	*Malosma laurina*	0.7	2.2	0.2	12
	CNDU	*Cneoridium dumosum*	0.6	2.4	0.2	26
	RHOV	*Rhus ovata*	0.5	1	0.2	9
	ERFA2	*Eriogonum fasciculatum*	0.5	1.4	0.2	15
	CECR	*Ceanothus crassifolius*	0.4	2.6	0.2	32
	ARCA11	*Artemisia californica*	0.3	1.2	0.2	21
	YUWH	*Yucca whipplei*	0.3	0.2	0.2	5
	CEOL	*Ceanothus oliganthus*	0.3	1.4	0.2	25
	KEAN	*Keckiella antirrhinoides*	0.3	0.5	0.2	4
Herbaceous						
	BRMA3	*Bromus madritensis*	0.6	2.6	0.2	20
	HIIN3	*Hirschfeldia incana*	0.3	0.7	0.2	11
	FIGA	*Filago gallica*	0.3	0.6	0.2	7
	MAMA8	*Marah macrocarpus*	0.3	0.5	0.2	6
	PTDR	*Pterostegia drymarioides*	0.2	2.8	2	60
	CEME2	*Centaurea melitensis*	0.2	0.2	0.2	2

***Arctostaphylos glandulosa* Alliance (Eastwood Manzanita)**

ASSOCIATIONS
Arctostaphylos glandulosa

LOCAL VEGETATION DESCRIPTION
One stand of *Arctostaphylos glandulosa* Shrubland form an open shrub layer (23%), where *Arctostaphylos glandulosa* dominates. Shrubs occur in two different strata, with low shrubs at 0-0.5m tall and tall shrubs at 1-2m tall. The herbaceous layer is open (1%) at 0-0.5m tall. Total vegetation cover is 25%.

In the *Arctostaphylos glandulosa* Association, *Arctostaphylos glandulosa* is the sole dominant shrub in the overstory. Other shrubs such as *Adenostoma fasciculatum* and *Cercocarpus betuloides* may occur at low cover, and various native herbs also may occur at low cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, 4908 ft
Aspect: SE
Slope: moderate, 8 degrees
Topography: undulating; upper slope
Litter Cover: 1%
Rock Cover: 52.2%
Bare Ground: 46%
Parent Material: mixed granitic and metamorphic
Soil Texture: coarse loamy sand

The *Arctostaphylos glandulosa* Alliance was sampled on a southerly, moderately steep slope within the Palomar - Cuyamaca Peak (M262Bo) Subsection along Volcan Mountain in an area recently burned.

Samples used to describe alliance: (n=1) SFVW147

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: outer North to Central and South Coasts (from the Klamath Mountains to Ventura County), montane Transverse Ranges (including Santa Monica Mountains to San Bernardino Mountains), montane Peninsular Ranges (including Santa Ana Mountains, San Jacinto Mountains, and Palomar - Cuyamaca), Anza-Borrego Desert

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	Freq	Avg	Min	Max
Shrub						
	ARGL3	*Arctostaphylos glandulosa*	1	19.0	19	19
	ADFA	*Adenostoma fasciculatum*	1	1.0	1	1
	QUCO7	*Quercus cornelius-mulleri*	1	1.0	1	1
	CEBE3	*Cercocarpus betuloides*	1	0.2	0.2	0.2
	CECO	*Ceanothus cordulatus*	1	0.2	0.2	0.2
	CECR	*Ceanothus crassifolius*	1	0.2	0.2	0.2
	HEAR5	*Heteromeles arbutifolia*	1	0.2	0.2	0.2
	LOSC2	*Lotus scoparius*	1	0.2	0.2	0.2
	YUWH	*Yucca whipplei*	1	0.2	0.2	0.2
Herbaceous						
	CRYPT	*Cryptantha*	1	0.2	0.2	0.2
	GALIU	*Galium*	1	0.2	0.2	0.2
	HEGR3	*Helianthus gracilentus*	1	0.2	0.2	0.2
	LOST4	*Lotus strigosus*	1	0.2	0.2	0.2

***Arctostaphylos glauca* Alliance (Bigberry Manzanita)**

ASSOCIATIONS
Arctostaphylos glauca

LOCAL VEGETATION DESCRIPTION
Stands of *Arctostaphylos glauca* Shrubland form a continuous shrub layer (70-83%, mean 76.5%) at 1-5m tall, where *Arctostaphylos glauca* dominates. The herbaceous layer is sparse (0.2-5%, mean 2.6%) at 0-0.5m tall. Trees may occur as emergents (4% cover, mean 4%) at 5-10m tall. Total vegetation cover is 75-85%, mean 80%.

In the *Arctostaphylos glauca* Association, *Arctostaphylos glauca* is the dominant shrub while *Adenostoma fasciculatum* is often present in relatively low cover. The herbaceous layer is sparsely vegetated with a variety of native species including *Camissonia* spp., *Galium* spp., *Marah macrocarpus,* and *Phacelia cicutaria*.

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 1 of the 2 surveys of the *Arctostaphylos glauca* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 2125-2130 ft, mean 2128 ft
Aspect: NE and SW
Slope: moderate to somewhat steep, range 14-22 degrees, mean 18.0 degrees
Topography: undulating or convex, middle slope
Litter Cover: range 40-60%, mean 50%
Rock Cover: range 6-45%, mean 25.5%
Bare Ground: range 10-28%, mean 19%
Parent Material: metamorphic or Mesozoic granite
Soil Texture: moderately coarse sandy loam or medium to very fine sandy loam

The *Arctostaphylos glauca* Alliance was sampled only in the Western Granitic Foothills (M262Bn) Subsection within the Pamo Valley and Lake Sutherland areas.

Samples used to describe alliance: (n=2) SDRP0350, SDRP0412

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

GLOBAL DISTRIBUTION
Alliance: Central Coast (including Santa Clara County south to Santa Barbara County) , inner South Coast, and montane Transverse and Peninsular Ranges (including W Riverside and San Diego Counties from Southern San Bernardino Mountains, San Jacinto Mountains, and San Diego County western foothills), Baja California

Arctostaphylos glauca Association: Transverse and Peninsular Ranges (including the southern San Bernardino and San Jacinto Mountains south to the San Diego County western foothills), though full distribution is not known

REFERENCES
Borchert et al. 2004, CNPS and CDFG 2005a, Evens and San 2004, Gordon and White 1994, Keeler-Wolf 1990, Sawyer and Keeler-Wolf 1995

***Arctostaphylos glauca* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	QUEN-t	*Quercus engelmannii*	0.5	2	4	4
Shrub						
	ARGL4	*Arctostaphylos glauca*	1	67.5	60	75
	ADFA	*Adenostoma fasciculatum*	1	6.5	6	7
	TODI	*Toxicodendron diversilobum*	0.5	0.5	1	1
	QUBE5	*Quercus berberidifolia*	0.5	0.5	1	1
	RHIL	*Rhamnus ilicifolia*	0.5	0.5	1	1
	SAAP2	*Salvia apiana*	0.5	0.5	1	1
	RHOV	*Rhus ovata*	0.5	0.5	1	1
	MIAU	*Mimulus aurantiacus*	0.5	0.1	0.2	0.2
Herbaceous						
	MAMA8	*Marah macrocarpus*	0.5	0.5	1	1
	BRMA3	*Bromus madritensis*	0.5	0.5	1	1
	PHPA3	*Phacelia parryi*	0.5	0.1	0.2	0.2
	GAAP2	*Galium aparine*	0.5	0.1	0.2	0.2
	CAMIS	*Camissonia hirtella*	0.5	0.1	0.2	0.2
	CAMIS	*Camissonia strigulosa*	0.5	0.1	0.2	0.2
	CAMIS	*Camissonia californica*	0.5	0.1	0.2	0.2
	CAMIS	*Camissonia*	0.5	0.1	0.2	0.2
	CRYPT	*Cryptantha*	0.5	0.1	0.2	0.2
	PHCI	*Phacelia cicutaria*	0.5	0.1	0.2	0.2
	CAMIS	*Camissonia bistorta*	0.5	0.1	0.2	0.2
	GALIU	*Galium*	0.5	0.1	0.2	0.2
Cryptogam						
	LICHEN	Lichen	0.5	0.5	1	1
	MOSS	Moss	0.5	0.1	0.2	0.2

***Arctostaphylos pringlei* Alliance (Pink-bracted Manzanita)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Arctostaphylos pringlei* Shrubland form a continuous shrub layer (68-95%, mean 81.5%), where *Arctostaphylos pringlei* dominates. The herbaceous layer is sparse (2-2%, mean 2%). Trees may occur as emergents (2% cover, mean 2%). Total vegetation cover is 70-95%, mean 82.5%.

In the *Arctostaphylos pringlei* Alliance, *Arctostaphylos pringlei* is dominant. *Quercus berberidifolia, Salvia apiana* and *Eriogonum fasciculatum* may also be present in lower cover. The sparse understory includes non-native and native species such as *Bromus madritensis*, *Bromus diandrus*, and *Galium angustifolium.* This alliance may be related to the *Arctostaphylos glandulosa-Arctostaphylos pringlei* Association, where *Arctostaphylos pringlei* and *Ceanothus leucodermis* are characteristically present in the shrub overstory and may be co-dominant or sub-dominant with *A. glandulosa*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2983-4257 ft, mean 3620 ft
Aspect: NE or SW
Slope: somewhat steep to steep, range 22-27 degrees, mean 24.5 degrees
Topography: undulating or convex, lower to middle slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: metamorphic or mixed granitic and metamorphic
Soil Texture: fine sand (in one plot)

The *Arctostaphylos pringlei* Alliance was sampled in the Western Granitic Foothills (M262Bn) and Palomar - Cuyamaca Peak (M262Bo) Subsections along lower to middle foothill slopes just west of Santa Ysabel Ranch to western Volcan Mountain.

Samples used to describe alliance: (n=2) SDRP0040, SDRP0230

RANK: G2 S2

GLOBAL DISTRIBUTION
Alliance: Peninsular Ranges (including San Diego County: western foothills and Palomar - Cuyamaca Peak area), Mountains of Anza-Borrego Desert State Park, though full distribution is not known. This alliance may be similar to the *Arctostaphylos glandulosa-Arctostaphylos pringlei* Association, which was sampled in Peninsular Ranges (Western Riverside County: San Jacinto Subsections).

REFERENCES
CDFG 1998, Klein and Evens 2005

***Arctostaphylos pringlei* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	QUCH2-t	*Quercus chrysolepis*	0.5	1	2	2
Shrub						
	ARPR	*Arctostaphylos pringlei*	1	62.5	60	65
	SAAP2	*Salvia apiana*	1	1.6	0.2	3
	ERFA2	*Eriogonum fasciculatum*	1	0.2	0.2	0.2
	QUBE5	*Quercus berberidifolia*	0.5	22.5	45	45
	CELE2	*Ceanothus leucodermis*	0.5	0.5	1	1
	ADFA	*Adenostoma fasciculatum*	0.5	0.5	1	1
	SYMO	*Symphoricarpos mollis*	0.5	0.1	0.2	0.2
	QUGR4	*Quercus × grandidentata*	0.5	0.1	0.2	0.2
	MIAU	*Mimulus aurantiacus*	0.5	0.1	0.2	0.2
	GUSA2	*Gutierrezia sarothrae*	0.5	0.1	0.2	0.2
Herbaceous						
	GAAN2	*Galium angustifolium*	1	0.2	0.2	0.2
	BRDI3	*Bromus diandrus*	1	0.2	0.2	0.2
	BRMA3	*Bromus madritensis*	1	0.2	0.2	0.2
	CLEMA	*Clematis (lasiantha)*	0.5	0.5	1	1
	CORI2	*Cordylanthus rigidus*	0.5	0.1	0.2	0.2
	AVBA	*Avena barbata*	0.5	0.1	0.2	0.2
Cryptogam						
	LICHEN	Lichen	0.5	1	2	2

***Artemisia californica* Alliance (California Sagebrush)**

ASSOCIATIONS
Artemisia californica
Artemisia californica-Malosma laurina

LOCAL VEGETATION DESCRIPTION
Stands of *Artemisia californica* Shrubland form an open to continuous shrub layer (13-80%, mean 37.2%), where *Artemisia californica* dominates or co-dominates with *Malosma laurina*. Shrubs are often in one layer at 0.5-2m tall but occasionally occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 0-5m tall. The herbaceous layer is sparse to intermittent (1-40%, mean 15.9%) at 0-0.5m tall. Trees seldom occur as emergents (0.2% cover, mean 0.2%) at 2-5m tall. Total vegetation cover is 22-95%, mean 51.2%.

In the *Artemisia californica* Association, *Artemisia californica* is the sole dominant shrub in the understory, while herbaceous species may be abundant in the understory, including *Nassella lepida, Bromus madritensis* and *Centaurea melitensis*. Shrub species *Malosma laurina* and *Eriogonum fasciculatum* are often present but in relatively low cover.

In the *Artemisia californica-Malosma laurina* Association, *Artemisia californica* and *Malosma laurina* co-dominate. *Mimulus aurantiacus* may also be present and similar in cover, while *Salvia apiana* also may be present but in lower cover. The non-native species, *Bromus madritensis,* is consistent in the understory.

Adolphia californica and *Ferocactus viridescens* were found in 1 of 11 surveys of the *Artemisia californica* Alliance, which are both CNPS List 2 species (CNPS 2005). See Appendix 3 for more information on these plants.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 118-1051 ft, mean 527 ft
Aspect: mostly SW, but occasionally NE and rarely NW
Slope: gentle to steep, range 2-28 degrees, mean 13.0 degrees
Topography: undulating, concave, flat and convex, lower slope to ridge top
Litter Cover: range 11.7-95%, mean 58.6%
Rock Cover: range 1.2-18%, mean 8.8%
Bare Ground: range 12-65%, mean 38%
Parent Material: often Mesozoic granite, occasionally sandstone
Soil Texture: more often medium to very fine sandy loam, occasionally moderately fine sandy clay loam, moderately fine clay loam, medium sand or fine sandy clay

The *Artemisia californica* Alliance was sampled in the western to middle portion of the study area in the Coastal Terraces (261Bj), Coastal Hills (261Bi), and Western Granitic Foothills (M262Bn) Subsections. It is found on exposed coastal hills to lower slopes of inland foothills on a variety of topographic settings.

Samples used to describe alliance: (n=11) SDRP0065, SDRP0087, SDRP0093, SDRP0132 SDRP0139, SDRP0162, SDRP0233, SDRP0280, SDRP0320, SDRP0358, SDRP0480

RANK:G1 S1, G2 S2, G3 S3, and G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Central and South Coast (including Marin County south to W Riverside and San Diego

Counties), Peninsular and Transverse Ranges (including the Santa Monica, southern San Bernardino, and Santa Ana Mountains, and western foothills of San Diego County), Channel Islands, Baja California

Artemisia californica Association: South Coast (including Ventura to W Riverside and San Diego Counties), Transverse Range (including Santa Monica Mountains), and Peninsular Ranges (including San Diego County: western foothills)
Artemisia californica-Malosma laurina Association: South Coast (from Ventura to San Diego County), Peninsular Ranges (including W Riverside County: Santa Ana Mountains, San Diego County: coastal hills and western foothills)

REFERENCES

Borchert et al. 2004, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San 2004, Gordon and White 1994, Hanes 1976, Keeler-Wolf 1990, Kirkpatrick and Hutchinson 1977, Klein and Evens 2005, 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	Freq	Avg	Min	Max
Shrub						
	ARCA11	*Artemisia californica*	1	25.3	10	42
	MALA6	*Malosma laurina*	0.8	5.8	0.2	23
	ERFA2	*Eriogonum fasciculatum*	0.7	1.6	0.2	8
	SAAP2	*Salvia apiana*	0.6	0.3	0.2	2
	MIAU	*Mimulus aurantiacus*	0.4	4.9	0.2	34
	OPLI3	*Opuntia littoralis*	0.3	0.6	0.2	5
	KEAN	*Keckiella antirrhinoides*	0.2	1.2	3	9
	SAME3	*Salvia mellifera*	0.2	1.1	1	10
	YUWH	*Yucca whipplei*	0.2	0.1	0.2	1
Herbaceous						
	BRMA3	*Bromus madritensis*	0.8	8.6	0.2	35
	CEME2	*Centaurea melitensis*	0.6	1	0.2	7
	HIIN3	*Hirschfeldia incana*	0.5	1.7	0.2	10
	AVBA	*Avena barbata*	0.5	0.4	0.2	2
	ERODI	*Erodium (brachycarpum, botrys, and moschatum)*	0.4	0.5	0.2	3
	VUMY	*Vulpia myuros*	0.4	0.2	0.2	1
	BRDI3	*Bromus diandrus*	0.2	0.6	1	5
	MICA6	*Mirabilis californica*	0.2	0.2	1	1
	LEFI11	*Lessingia filaginifolia*	0.2	0.1	0.2	1
Cryptogam						
	MOSS	Moss	0.2	0.3	1	2

***Artemisia californica-Eriogonum fasciculatum* Alliance (California Sagebrush - California Buckwheat)**

ASSOCIATIONS
Artemisia californica-Eriogonum fasciculatum
Artemisia californica-Eriogonum fasciculatum-Malosma laurina

LOCAL VEGETATION DESCRIPTION
Stands of *Artemisia californica-Eriogonum fasciculatum* Shrubland form an open to continuous shrub layer (25-75%, mean 39.3%), where *Artemisia californica* and *Eriogonum fasciculatum* co-dominate. Shrubs often occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is sparse to intermittent (1-50%, mean 20.5%) at 0-1m tall. Total vegetation cover is 35-75%, mean 51.5%.

In the *Artemisia californica-Eriogonum fasciculatum* Association, *Artemisia californica* and *Eriogonum fasciculatum* are co-dominants in the shrub layer. A variety of non-native and native herbs occur in the understory with variable cover, including *Bromus madritensis, B. hordeaceus, Hirschfeldia incana, Erodium* spp., *Claytonia* spp., and *Navarretia* spp.

The *Artemisia californica-Eriogonum fasciculatum-Malosma laurina* Association is quite similar, though it also has *Malosma laurina* as a co-dominant in the shrub layer.

Quercus dumosa, a CNPS List 1B species (CNPS 2005), was found in 1 of 12 surveys of the *Artemisia californica-Eriogonum fasciculatum* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 336-1901 ft, mean 721 ft
Aspect: variable
Slope: moderate to steep, range 7-45 degrees, mean 18.7 degrees
Topography: convex and undulating, rarely concave, lower to upper slope
Litter Cover: range 4.5-63%, mean 31.7%
Rock Cover: range 5.2-21%, mean 11.4%
Bare Ground: range 12-85%, mean 51.7%
Parent Material: gabbro or diorite or Mesozoic granite, Mesozoic granite, and alluvium and other deposits
Soil Texture: more often medium to very fine sandy loam but also moderately coarse sandy loam. Occasionally moderately fine clay loam, moderately fine sandy clay loam and medium sand

The *Artemisia californica-Eriogonum fasciculatum* Alliance was sampled in the Coastal Hills (261Bi) and Western Granitic Foothills (M262Bn) Subsections, especially near Lake Hodges and east to the Pamo Valley area. It is usually found on more anthropogenically disturbed slopes (e.g., foot traffic, grazing) than the pure *Artemisia californica* or *Artemisia californica-Salvia apiana* alliances.

Samples used to describe alliance: (n=12) SDRP0089, SDRP0090, SDRP0091, SDRP0125, SDRP0130, SDRP0164, SDRP0190, SDRP0261, SDRP0309, SDRP0319, SDRP0345, SDRP0467

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

GLOBAL DISTRIBUTION
Alliance: Central Coast (including San Benito County), South Coast (including Ventura to San Diego County), montane Transverse and Peninsular Ranges (including Ventura and Los Angeles Counties: Santa Monica Mountains, W Riverside County: Santa Ana Mountains, and San Diego County: western foothills), Baja California

Artemisia californica-Eriogonum fasciculatum/Annual Grass-Herb Association: South Coast (including Ventura to W Riverside and San Diego Counties), Peninsular Ranges (W Riverside County: Santa Ana Mountains, San Diego County: coastal hills and western foothills)
Artemisia californica-Eriogonum fasciculatum-Malosma laurina Association: South Coast (San Diego County, Peninsular Ranges (W Riverside County: Santa Ana Mountains, San Diego County: including coastal hills and western foothills)

REFERENCES

Boyd et al.1995, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Gordon and White 1994, Klein and Evens 2005, Sawyer and Keeler-Wolf 1995, White 1994

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

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	ARCA11	*Artemisia californica*	1	16.2	3	30
	ERFA2	*Eriogonum fasciculatum*	1	13.5	1	25
	MALA6	*Malosma laurina*	0.6	4.5	0.2	35
	SAAP2	*Salvia apiana*	0.5	0.5	0.2	3
	RHCR	*Rhamnus crocea*	0.3	1	0.2	12
	KEAN	*Keckiella antirrhinoides*	0.3	0.6	0.2	5
	RHOV	*Rhus ovata*	0.2	1.1	1	8
	CNDU	*Cneoridium dumosum*	0.2	0.6	0.2	5
Herbaceous						
	BRMA3	*Bromus madritensis*	0.8	8.6	1	50
	HIIN3	*Hirschfeldia incana*	0.5	2.2	0.2	25
	ERODI	*Erodium (brachycarpum, botrys, and moschatum)*	0.4	2.4	0.2	15
	BRHO2	*Bromus hordeaceus*	0.3	3.5	7	18
	CEME2	*Centaurea melitensis*	0.3	1	0.2	12
	AVBA	*Avena barbata*	0.3	0.5	0.2	5
	BRASS2	*Brassica*	0.2	0.1	0.2	1
Cryptogam						
	MOSS	Moss	0.2	1.9	4	15
	LICHEN	Lichen	0.2	0.3	0.2	4

***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 open to intermittent shrub layer (20-54%, mean 41.2%) at 0-2m tall, where *Artemisia californica* and *Salvia apiana* usually co-dominate. The herbaceous layer is sparse to intermittent (2-52%, mean 18.5%) at 0-0.5m tall. Trees occur occasionally as emergents (0.2-5% cover, mean 2.6%) at 5-10m tall, including *Quercus engelmannii* or *Q. agrifolia*. Total vegetation cover is 43-65%, mean 55.7%.

In the *Artemisia californica-Salvia apiana* Association, the two shrub species co-dominate while *Eriogonum fasciculatum, Eriophyllum confertiflorum,* and *Malosma laurina* are often present but in relatively low cover. Non-native species, such as *Bromus madritensis,* are often in the understory.

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 2 of 6 surveys of the *Artemisia californica-Salvia apiana* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 476-2308 ft, mean 1156 ft
Aspect: NE, NW and SW
Slope: gentle to somewhat steep range 1-25 degrees, mean 16.3 degrees
Topography: more often convex, but occasionally flat or undulating
Litter Cover: range 20-24%, mean 22%
Rock Cover: range 3-35%, mean 19%
Bare Ground: range 40-70%, mean 55%
Parent Material: frequently Mesozoic granite, rarely metamorphic
Soil Texture: more often moderately coarse sandy loam, occasionally medium loam, medium to very fine sandy loam or moderately fine clay loam

The *Artemisia californica-Salvia apiana* Alliance was sampled in the Coastal Hills (261Bi) and Western Granitic Foothills (M262Bn) Subsections, especially near Lake Hodges and east to the Pamo Valley area. Some stands have signs of recent burning.

Samples used to describe alliance: (n=6) SDRP0097, SDRP0136, SDRP0138, SDRP0140, SDRP0448, SDRP0471

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: South Coast (including San Diego County) to Peninsular Ranges (including W Riverside and San Diego Counties), California.

Artemisia californica-Salvia apiana Association: Peninsular Ranges (including W Riverside County: Santa Ana Mountains, San Diego County: coastal hills and western foothills)

REFERENCES
Gordon and White 1994, Klein and Evens 2005

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

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	QUEN-t	*Quercus engelmannii*	0.3	0.2	0.2	1
Shrub						
	ARCA11	*Artemisia californica*	1	23.2	5	40
	SAAP2	*Salvia apiana*	1	12.8	6	17
	ERFA2	*Eriogonum fasciculatum*	1	1.9	0.2	5
	ERCO25	*Eriophyllum confertiflorum*	0.7	0.1	0.2	0.2
	MALA6	*Malosma laurina*	0.5	1.8	1	5
	YUWH	*Yucca whipplei*	0.5	0.4	0.2	2
	HASQ2	*Hazardia squarrosa*	0.5	0.4	0.2	2
	MIAU	*Mimulus aurantiacus*	0.5	0.2	0.2	1
	KEAN	*Keckiella antirrhinoides*	0.3	0.4	0.2	2
Herbaceous						
	BRMA3	*Bromus madritensis*	0.8	1.4	0.2	5
	MICA6	*Mirabilis californica*	0.5	0.4	0.2	2
	PTDR	*Pterostegia drymarioides*	0.3	4.2	0.2	25
	ERODI	*Erodium (brachycarpum, botrys, and moschatum)*	0.3	3.5	1	20
	BRDI3	*Bromus diandrus*	0.3	0.5	1	2
	CEME2	*Centaurea melitensis*	0.3	0.3	1	1
	AVBA	*Avena barbata*	0.3	0.2	0.2	1
Cryptogam						
	MOSS	Moss	0.5	2	2	5

***Artemisia californica-Salvia mellifera* Alliance (California Sagebrush - Black Sage)**

ASSOCIATIONS
Artemisia californica-Salvia mellifera-Baccharis sarothroides

LOCAL VEGETATION DESCRIPTION
Stands of *Artemisia californica-Salvia mellifera* Shrubland form an open to continuous shrub layer (30-90%, mean 60.7%), where *Artemisia californica* and *Salvia mellifera* co-dominate. Shrubs often occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is sparse to open (1-25%, mean 6.5%) at 0-2m tall. Trees infrequently occur as emergents (4% cover, mean 4%) at 5-10m tall. Total vegetation cover is 48-92%, mean 67.5%.

In the *Artemisia californica-Salvia mellifera-Baccharis sarothroides* Association, *Baccharis sarothroides* is a co-dominant with the other two shrubs. *Malosma laurina, Mimulus aurantiacus,* and *Rhus integrifolia* also may be scattered in the shrub layer. *Quercus agrifolia* is occasionally emerging in the tree layer. The herbaceous layer is dominated by non-native species such as *Brassica* sp., *Centaurea melitensis,* and *Foeniculum vulgare.*

Adolphia californica and *Ceanothus verrucosus*, both CNPS List 2 species (CNPS 2005), were found in 1 of 6 surveys of the *Artemisia californica-Salvia mellifera* Alliance. See Appendix 3 for more information on these plants.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 172-398 ft, mean 281 ft
Aspect: often NE, occasionally NW or SE
Slope: gentle to steep, range 2-30 degrees, mean 14.5 degrees
Topography: more often flat or undulating, occasionally concave or convex
Litter Cover: range 43.7-84%, mean 63.4%
Rock Cover: range 0.4-46%, mean 15.6%
Bare Ground: range 5-32%, mean 15.7%
Parent Material: sandstone, occasionally Mesozoic granite
Soil Texture: more often moderately coarse sandy loam or moderately fine clay loam, occasionally medium to very fine loamy sand

The *Artemisia californica-Salvia mellifera* Alliance was sampled mainly in the western portion of the study area in the Coastal Hills (261Bi) and Coastal Terraces (261Bj) Subsections. It was found on northerly or neutral slopes on variable topography.

Samples used to describe alliance: (n=6) SDRP0075, SDRP0272, SDRP0273, SDRP0275, SDRP0276, SDRP0278

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

GLOBAL DISTRIBUTION
Alliance: Central Coast (including Santa Clara and San Benito Counties), South Coast (including San Diego County: coastal hills and terraces), Transverse and Peninsular Ranges (including W Riverside County: Santa Ana Mountains and San Jacinto Foothills), southern California along the Coast Ranges

Artemisia californica-Salvia mellifera-Baccharis sarothroides Association: South Coast and Peninsular Ranges (including San Diego County: coastal hills and coastal terraces), 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	Freq	Avg	Min	Max
Shrub						
	ARCA11	*Artemisia californica*	1	25.5	13	40
	SAME3	*Salvia mellifera*	1	14.4	0.2	35
	BASA2	*Baccharis sarothroides*	0.8	11.5	5	27
	MALA6	*Malosma laurina*	0.8	1.1	0.2	3
	RHIN2	*Rhus integrifolia*	0.8	0.4	0.2	1
	MIAU	*Mimulus aurantiacus*	0.7	3.9	0.2	20
	XYBI	*Xylococcus bicolor*	0.3	1.5	0.2	9
	SAME5	*Sambucus mexicana*	0.3	0.9	0.2	5
Herbaceous						
	CEME2	*Centaurea melitensis*	0.7	0.7	0.2	2
	BRASS2	*Brassica*	0.5	0.4	0.2	1
	FOVU	*Foeniculum vulgare*	0.3	4.3	1	25
	COSE4	*Cortaderia selloana*	0.3	0.2	0.2	1

***Baccharis pilularis* Alliance (Coyote Brush)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
The stand of *Baccharis pilularis* Shrubland forms an open shrub layer (25%) at 1-2m tall, where *Baccharis pilularis* dominates. The herbaceous layer is open (22%) at 0-0.5m tall. Total vegetation cover is 40%.

In the *Baccharis pilularis* Alliance, *Baccharis pilularis* dominates, while shrubs such as *B. salicifolius, Eriogonum fasciculatum,* or *Artemisia californica* also may be found in the shrub layer but in relatively low cover. The understory is dominated by non-native species such as *Erodium* spp. and *Bromus* spp., yet native species such as *Juncus* spp.*, Muhlenbergia rigens,* and *Lessingia filaginifolia* may be found.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 389 ft
Aspect: NE
Slope: moderate, 6 degrees
Topography: concave, bottom
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: Mesozoic granite
Soil Texture: no data
Samples used to describe alliance: (n=1) SDRP0129

The *Baccharis pilularis* Alliance was sampled in the Coastal Hills (261Bi) Subsection in the Lake Hodges area on alluvial surfaces. It is usually indicative of disturbed seral conditions and is often found in relatively mesic low-lying settings in southern California.

RANK: G5 S5

GLOBAL DISTRIBUTION
Alliance: widely distributed from the inner and outer Coast and Coast Ranges (from Humboldt to San Diego County)

REFERENCES
Borchert et al. 2004, CNPS and CDFG 2005b, Evens and San 2004, NatureServe et al. 2003a, Sawyer and Keeler-Wolf 1995

***Baccharis pilularis* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	BAPI	*Baccharis pilularis*	1	25	25	25
	ERFA2	*Eriogonum fasciculatum*	1	4	4	4
	BASA4	*Baccharis salicifolia*	1	1	1	1
	ISME5	*Isocoma menziesii*	1	1	1	1
Herbaceous						
	BRHO2	*Bromus hordeaceus*	1	10	10	10
	ERODI	*Erodium (brachycarpum, botrys, and moschatum)*	1	10	10	10
	BRDI3	*Bromus diandrus*	1	5	5	5
	BRMA3	*Bromus madritensis*	1	3	3	3
	MURI2	*Muhlenbergia rigens*	1	2	2	2
	JUDU	*Juncus dubius*	1	1	1	1
	AMPS	*Ambrosia psilostachya*	1	1	1	1
	MEPO3	*Medicago polymorpha*	1	0.2	0.2	0.2
	JUPH	*Juncus phaeocephalus*	1	0.2	0.2	0.2
	NAPU4	*Nassella pulchra*	1	0.2	0.2	0.2
	HOMU	*Hordeum murinum*	1	0.2	0.2	0.2
	HIIN3	*Hirschfeldia incana*	1	0.2	0.2	0.2
	LEFI11	*Lessingia filaginifolia*	1	0.2	0.2	0.2
	POLYG4	*Polygonum*	1	0.2	0.2	0.2
	CYDA	*Cynodon dactylon*	1	0.2	0.2	0.2
Cryptogam						
	MOSS	Moss	1	1	1	1

***Baccharis salicifolia* Alliance (Mulefat)**

ASSOCIATIONS
Baccharis salicifolia

LOCAL VEGETATION DESCRIPTION
Stands of *Baccharis salicifolia* Shrubland form an open to continuous shrub layer (4-72%, mean 32.9%), where *Baccharis salicifolia* 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 sparse to continuous (1-72%, mean 17.9%) at 0-1m tall. Trees often occur as emergents (0.2-4% cover, mean 1.3%) at 2-15m tall. Total vegetation cover is 8-90%, mean 51.1%.

In the *Baccharis salicifolia* Association, *B. salicifolia* is usually dominant. Non-native *Tamarix* is often found but usually in relatively low cover. *B. pilularis* may also be present in low cover. *Salix gooddingii* may be emergent in some stands. The herbaceous layer is dominated by a variety of non-native and native species such as *Ambrosia psilostachya, Bromus hordeaceus, Hirschfeldia incana, Lepidium latifolium,* and *Urtica dioica*.

Iva hayesiana, a CNPS List 2 species, and *Juncus acutus* subsp. *leopoldii,* a CNPS List 4 species (CNPS 2005), were found in 1 of 8 surveys of the *Baccharis salicifolia* Alliance. Both were in the same stand. See Appendix 3 for more information on these plants.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 216-3000 ft, mean 771 ft
Aspect: more often flat of NW, but occasionally SW or variable
Slope: flat to somewhat steep, range 0-15 degrees, mean 2.6 degrees
Topography: often flat, occasionally concave, often bottom occasionally lower slope
Litter Cover: range 54.3-72%, mean 63%
Rock Cover: range 0.4-20%, mean 10.2%
Bare Ground: range 3-40%, mean 21.5%
Parent Material: mixed alluvium often Mesozoic granite or sandstone
Soil Texture: more often coarse sand, occasionally medium to very fine sandy loam

The *Baccharis salicifolia* Association was sampled in a variety of seasonally flooded habitats of the Coastal Hills (261Bi) and Western Granitic Foothills (M262Bn) Subsections, including the margin of Lake Hodges and tributaries of Santa Ysabel Creek and the San Dieguito River watershed.

Samples used to describe alliance: (n=8) SDRP0064, SDRP0067, SDRP0078, SDRP0081, SDRP0150, SDRP0163, SDRP0200, SDRP0316

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: inner North Coast, Central and South Coast, Central Valley, Klamath foothills, Cascade Range foothills, Sierra Nevada, Transverse and Peninsular Ranges (including Ventura to W Riverside and San Diego Counties), Mojave Desert, Colorado Desert (including Anza-Borrego Desert)

REFERENCES
Boyd et al. 1995, CDFG 1998, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Klein and Evens 2005, Potter 2003, Sawyer and Keeler-Wolf 1995

***Baccharis salicifolia* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	SAGO-t	*Salix gooddingii*	0.5	0.7	0.2	4
Shrub						
	BASA4	*Baccharis salicifolia*	1	27.9	3	72
	TAMAR2	*Tamarix*	0.8	0.3	0.2	1
	BAPI	*Baccharis pilularis*	0.5	1	0.2	7
	ISME5	*Isocoma menziesii*	0.4	0.9	0.2	7
	SAME5	*Sambucus mexicana*	0.4	0.3	0.2	2
	BASA2	*Baccharis sarothroides*	0.3	1.3	3	7
	MEAL2	*Melilotus albus*	0.3	0.2	0.2	1
Herbaceous						
	HIIN3	*Hirschfeldia incana*	0.5	0.8	0.2	3
	COMA2	*Conium maculatum*	0.4	1.8	1	8
	BRHO2	*Bromus hordeaceus*	0.4	1.5	0.2	11
	CYCA	*Cynara cardunculus*	0.4	0.2	0.2	1
	AMBRO	*Ambrosia*	0.4	0.2	0.2	0.2
	URDI	*Urtica dioica*	0.4	0.2	0.2	0.2
	BRDI3	*Bromus diandrus*	0.3	1.4	1	10
	LELA2	*Lepidium latifolium*	0.3	3.5	1	27
	ARDO4	*Arundo donax*	0.3	0.4	1	2
	BRMA3	*Bromus madritensis*	0.3	0.3	0.2	2

***Ceanothus crassifolius* Alliance (Hoaryleaf Ceanothus)**

ASSOCIATIONS
Ceanothus crassifolius
Ceanothus crassifolius-Adenostoma fasciculatum-Xylococcus bicolor

LOCAL VEGETATION DESCRIPTION
Stands of *Ceanothus crassifolius* Shrubland form an open to continuous shrub layer (25-70%, mean 51.2%), where *Ceanothus crassifolius* dominates. Shrubs usually occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is sparse to intermittent (0.2-65%, mean 15.4%) at 0-0.5m tall. Total vegetation cover is 26-95%, mean 57.5%.

In the *Ceanothus crassifolius* Association, *Ceanothus crassifolius* is consistently dominant. Other shrubs, including *Adenostoma fasciculatum, Artemisia californica, Keckiella antirrhinoides, Mimulus aurantiacus,* and *Salvia mellifera,* may be present in lower cover. *Marah macrocarpus* and annual grasses are present consistently in the herb layer.

In the *Ceanothus crassifolius-Adenostoma fasciculatum-Xylococcus bicolor* Association, *Ceanothus crassifolius* is dominant. *Adenostoma fasciculatum, Xylococcus bicolor, Malosma laurina, Salvia mellifera,* and *Rhus ovata* are consistently present in lower cover. This association is fire-dependent and probably transitions to the *Adenostoma fasciculatum-Xylococcus bicolor-Rhus ovata-Ceanothus crassifolius* Association, where *C. crassifolius* is not dominant but usually present.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low (to mid), range 690-1940 ft, mean 1178 ft
Aspect: often NW, occasionally SE or NE
Slope: somewhat steep to steep, range 18-36 degrees, mean 24.0 degrees
Topography: often undulating, occasionally flat, lower to middle slope
Litter Cover: range 19.5-88%, mean 56.8%
Rock Cover: range 2.2-36%, mean 13.5%
Bare Ground: range 1-73%, mean 24.8%
Parent Material: Mesozoic granite
Soil Texture: more often medium to very fine sandy loam, occasionally medium loam

The *Ceanothus crassifolius* Alliance was sampled only within the Western Granitic Foothills (M262Bn) Subsection in the lower foothills of Pamo Valley and Lake Sutherland areas.

Samples used to describe alliance: (n=6) SDRP0307, SDRP0308, SDRP0311, SDRP0438, SDRP0465, SDRP0479

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, San Gabriel, San Bernardino, Santa Ana, and San Jacinto Mountains, and western foothills of San Diego County), Baja California

Ceanothus crassifolius Association: Transverse and Peninsular Ranges (from San Bernardino and San Gabriel Mountains south to the western foothills of San Diego County)
Ceanothus crassifolius-Adenostoma fasciculatum-Xylococcus bicolor Association: Peninsular Ranges (including W Riverside County: Santa Ana Mountains, San Diego County: western foothills)

REFERENCES

Borchert et al. 2004, Boyd et al. 1995, CNPS and CDFG 2005b, Gordon and White 1994, Klein and Evens 2005, Minnich 1976, Sawyer and Keeler-Wolf 1995

***Ceanothus crassifolius* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	CECR	*Ceanothus crassifolius*	1	35.7	14	60
	SAME3	*Salvia mellifera*	0.8	3.5	0.2	12
	MALA6	*Malosma laurina*	0.8	2.8	2	5
	RHOV	*Rhus ovata*	0.8	1.8	1	3
	ADFA	*Adenostoma fasciculatum*	0.7	4	4	10
	XYBI	*Xylococcus bicolor*	0.7	2.5	0.2	8
	ARCA11	*Artemisia californica*	0.5	0.7	0.2	3
	MIAU	*Mimulus aurantiacus*	0.5	0.2	0.2	1
	CNDU	*Cneoridium dumosum*	0.3	0.9	0.2	5
Herbaceous						
	MAMA8	*Marah macrocarpus*	0.7	2	0.2	6
	BRMA3	*Bromus madritensis*	0.3	2.5	0.2	15
	BRDI3	*Bromus diandrus*	0.3	2.2	3	10

***Ceanothus integerrimus* Alliance (Deerbrush)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
The stand of *Ceanothus integerrimus* Shrubland forms an intermittent shrub layer (65%), where *Ceanothus integerrimus* usually dominates, though it may co-dominate. The herbaceous layer is sparse (1%).Total vegetation cover is 65%.

In one sample of *Ceanothus integerrimus* Alliance, *Ceanothus integerrimus* co-dominates with *Rhamnus tomentella.* The understory herbaceous layer is sparse and includes both native and non-native species.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, 5008 ft
Aspect: NW
Slope: Steep, 45 degrees
Topography: undulating, upper slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed granitic and metamorphic
Soil Texture: no data

The *Ceanothus integerrimus* Alliance was sampled only within the Palomar - Cuyamaca Peak (M262Bo) Subsection on the upper elevation slope of Volcan Mountain.

Samples used to describe alliance: (n=1) SDRP0212

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

GLOBAL DISTRIBUTION
Alliance: North and Central Coast, Klamath Ranges, Cascade Ranges, Sierra Nevada, Transverse and Peninsular Ranges (including W Riverside County: San Jacinto and Santa Ana Mountains; San Diego County: Palomar - Cuyamaca Peak), Colorado Desert (including mountains of Anza-Borrego Desert State Park)

REFERENCES
CDFG 1998, Klein and Evens 2005, NatureServe et al. 2003b, Sawyer and Keeler-Wolf 1995

***Ceanothus integerrimus* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	CEIN3	*Ceanothus integerrimus*	1	45	45	45
	RHTO6	*Rhamnus tomentella*	1	35	35	35
	TODI	*Toxicodendron diversilobum*	1	1	1	1
	KETE	*Keckiella ternata*	1	0.2	0.2	0.2
Herbaceous						
	GAAN2	*Galium angustifolium*	1	1	1	1
	SCCA2	*Scrophularia californica*	1	0.2	0.2	0.2
	MEIM	*Melica imperfecta*	1	0.2	0.2	0.2
	BRDI3	*Bromus diandrus*	1	0.2	0.2	0.2
	CLRH	*Clarkia rhomboidea*	1	0.2	0.2	0.2
	BRHO2	*Bromus hordeaceus*	1	0.2	0.2	0.2

***Ceanothus leucodermis* Alliance (Chaparral Whitethorn)**

ASSOCIATIONS
Ceanothus leucodermis

LOCAL VEGETATION DESCRIPTION
Stands of *Ceanothus leucodermis* Shrubland form an intermittent shrub layer (20-55%, mean 37.5%), where *Ceanothus leucodermis* dominates. The herbaceous layer is sparse (8-30%, mean 19%) at 0-05.m tall, and trees are sparse emergents (2-5%, mean 3.5%). Total vegetation cover is 45-60%, mean 52.5%.

In the *Ceanothus leucodermis* Association, *Ceanothus leucodermis* is dominant while other shrubs such as *Toxicodendron diversilobum, Lotus scoparius, Lonicera subspicata, Ribes nevadense*, *Ericameria parishii,* and *Salvia apiana* may be present in lower cover. The herbaceous layer is sparse (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, 2775-4709 ft, mean 3742 ft
Aspect: SW, NE (variable)
Slope: moderate, range 10-14 degrees, mean 12.0 degrees
Topography: concave to convex, bottom to middle slope
Litter Cover: 10% (one sample)
Rock Cover: 15.2% (one sample)
Bare Ground: 74% (one sample)
Parent Material: mixed granitic and metamorphic
Soil Texture: medium to very fine sandy loam

The *Ceanothus leucodermis* Alliance was sampled within the Western Granitic Foothills (M262Bn) Subsection on exposed slopes in transition areas from coastal sage to chaparral. It also was sampled within the Palomar - Cuyamaca Peak (M262Bo) Subsection on Volcan Mountain where it has been recently burned (e.g., regeneration of this alliance has occurred after the Pines Fire of 2002) in areas above directly at/above canyon bottoms.

Samples used to describe alliance: (n=3) SDRP0050, SFVW137, SFVW148

RANK: G3 S3 and 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, and San Jacinto Mountains; western foothills and Palomar - Cuyamaca Peak of San Diego County), Baja California

Ceanothus leucodermis Association: Transverse and Peninsular Ranges (including San Bernardino, San Gabriel, and San Jacinto Mountains; western foothills and Palomar - Cuyamaca Peak of San Diego County), though full distribution is not known

REFERENCES
CNPS and CDFG 2005a, Gordon and White 1994, Klein and Evens 2005, NatureServe 2003b, Sawyer and Keeler-Wolf 1995

***Ceanothus leucodermis* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	PLRA-t	*Platanus racemosa*	0.3	0.7	2	2
Tree Understory						
	QUCH2-m	*Quercus chrysolepis*	0.3	1.0	3	3
	QUKE-m	*Quercus kelloggii*	0.3	0.7	2	2
Shrub						
	CELE2	*Ceanothus leucodermis*	1	23.3	8	45
	TODI	*Toxicodendron diversilobum*	0.7	0.7	1	1
	LOSC2	*Lotus scoparius*	0.3	2.7	8	8
	LOSU2	*Lonicera subspicata*	0.3	1.3	4	4
	RINE	*Ribes nevadense*	0.3	1.3	4	4
	ERPA24	*Ericameria parishii*	0.3	1.0	3	3
	SAAP2	*Salvia apiana*	0.3	0.7	2	2
	ADFA	*Adenostoma fasciculatum*	0.3	0.3	1	1
	ARCA11	*Artemisia californica*	0.3	0.3	1	1
	CEBE3	*Cercocarpus betuloides*	0.3	0.3	1	1
	SAME5	*Sambucus mexicana*	0.3	0.3	1	1
	ARGL3	*Arctostaphylos glandulosa*	0.3	0.1	0.2	0.2
	ERCO25	*Eriophyllum confertiflorum*	0.3	0.1	0.2	0.2
	PRIL	*Prunus ilicifolia*	0.3	0.1	0.2	0.2
	RULE	*Rubus leucodermis*	0.3	0.1	0.2	0.2
	SYMO	*Symphoricarpos mollis*	0.3	0.1	0.2	0.2
Herbaceous						
	BRDI3	*Bromus diandrus*	0.7	0.1	0.2	0.2
	BRMA3	*Bromus madritensis*	0.3	1.7	5	5
	CLPE	*Claytonia perfoliata*	0.3	1.0	3	3
	BRTE	*Bromus tectorum*	0.3	0.7	2	2
	MEIM	*Melica imperfecta*	0.3	0.7	2	2
	URDI	*Urtica dioica*	0.3	0.7	2	2
	ARDO3	*Artemisia douglasiana*	0.3	0.3	1	1
	PHIM	*Phacelia imbricata*	0.3	0.3	1	1
	STBU	*Stachys bullata*	0.3	0.3	1	1
	AVBA	*Avena barbata*	0.3	0.1	0.2	0.2
	GAAN2	*Galium angustifolium*	0.3	0.1	0.2	0.2
	PHACE	*Phacelia*	0.3	0.1	0.2	0.2
Cryptogam						
	LICHEN	*Lichen*	0.3	1.7	5	5
	MOSS	*Moss*	0.3	1.0	3	3

***Ceanothus oliganthus* Alliance (Hairyleaf Ceanothus)**

ASSOCIATIONS
Ceanothus oliganthus-Adenostoma fasciculatum-Xylococcus bicolor

LOCAL VEGETATION DESCRIPTION
Stands of *Ceanothus oliganthus* Shrubland form an intermittent to continuous shrub layer (28-75%, mean 54.5%), where *Ceanothus oliganthus* usually dominates. Shrubs often occur in two different strata, with low shrubs at 1-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is sparse to intermittent (1-30%, mean 14.5%) at 0-0.5m tall, and trees may occur as sparse emergents (2% in one sample). Total vegetation cover is 40-80%, mean 60.8%.

In the *Ceanothus oliganthus-Adenostoma fasciculatum-Xylococcus bicolor* Association, Ceanothus oliganthus dominates while *Salvia mellifera, Adenostoma fasciculatum,* and *Xylococcus bicolor* are consistently found in lower cover. Non-native species *Bromus madritensis* and *Hirschfeldia incana* are dominant in the sparse herbaceous layer with a variety of native herbaceous species. Recent fire is evident with shrub trunks burned almost to the ground.

In another stand of the alliance, *Ceanothus oliganthus* co-dominates with *Ribes nevadense* in a riparian area that was burned less than two years ago (in an area affected by the Pine Fire of 2002).

Ceanothus tomentosus and *C. oliganthus* were sometimes indiscernible in the field. While the occurrence of *C. oliganthus* was confirmed by UC-Riverside botanist Andy Sanders in the region where this type was sampled, it is possible that either *Ceanothus* species may be present and both are included within this overarching alliance.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1150-1741 ft, mean 1431 ft
Aspect: NE or NW
Slope: gentle to moderate range 4-12 degrees, mean 7.3 degrees
Topography: often flat, occasionally convex or concave
Litter Cover: range 20-70%, mean 38.3%
Rock Cover: range 11-60%, mean 30.7%
Bare Ground: range 10-45%, mean 23.3%
Parent Material: Mesozoic granite, mixed granitic and metamorphic
Soil Texture: frequently medium to very fine sandy loam, occasionally moderately fine sandy clay loam

The *Ceanothus oliganthus* Alliance was sampled in areas that have had recent fire disturbance, including riparian areas, and tends to senesce after about three to four decades. It was found in the Western Granitic Foothills (M262Bn) Subsection, primarily within the Boden and Pamo Canyon areas, and in the Palomar - Cuyamaca Peak (M262Bo) Subsection in Volcan Mountain (especially after the Pines Fire of 2002).

Samples used to describe alliance: (n=4) SDRP0148, SDRP0425, SDRP0495, SFVW150

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: Central Coast (including Los Padres National Forest), Transverse and Peninsular Ranges (including Santa Monica, San Gabriel, Santa Ana, and San Jacinto Mountains; western foothills and Palomar - Cuyamaca Peak of San Diego County)

Ceanothus oliganthus-Adenostoma fasciculatum-Xylococcus bicolor Association: southern Peninsular

Ranges (western foothills of San Diego County), though full distribution is not known

REFERENCES
Borchert et al. 2004, CNPS and CDFG 2005b, Klein and Evens 2005

***Ceanothus oliganthus* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Understory						
	CADE27-I	*Calocedrus decurrens*	0.25	0.3	1	1
	PSMA-I	*Pseudotsuga*	0.25	0.3	1	1
	PICO3-I	*Pinus coulteri*	0.25	0.1	0.2	0.2
	QUCH2-I	*Quercus chrysolepis*	0.25	0.1	0.2	0.2
Shrub						
	CEOL	*Ceanothus oliganthus*	1	37.0	14	55
	SAME3	*Salvia mellifera*	0.75	5.8	4	15
	ADFA	*Adenostoma fasciculatum*	0.75	3.5	2	9
	XYBI	*Xylococcus bicolor*	0.75	2.3	0.2	8
	RHOV	*Rhus ovata*	0.75	1.3	1	2
	RINE	*Ribes nevadense*	0.5	3.6	0.2	14
	MALA6	*Malosma laurina*	0.5	0.3	0.2	1
	SYMO	*Symphoricarpos mollis*	0.5	0.1	0.2	0.2
	HESC2	*Helianthemum*	0.25	2.5	10	10
	QUBE5	*Quercus berberidifolia*	0.25	1.0	4	4
	CECR	*Ceanothus crassifolius*	0.25	0.3	1	1
	CNDU	*Cneoridium dumosum*	0.25	0.3	1	1
	KEAN	*Keckiella antirrhinoides*	0.25	0.3	1	1
	ARCA11	*Artemisia californica*	0.25	0.1	0.2	0.2
	ERFA2	*Eriogonum fasciculatum*	0.25	0.1	0.2	0.2
	HASQ2	*Hazardia squarrosa*	0.25	0.1	0.2	0.2
	LOSC2	*Lotus scoparius*	0.25	0.1	0.2	0.2
	RHIL	*Rhamnus ilicifolia*	0.25	0.1	0.2	0.2
	RULE	*Rubus leucodermis*	0.25	0.1	0.2	0.2
Herbaceous						
	BRMA3	*Bromus madritensis*	0.5	1.3	0.2	5
	HIIN3	*Hirschfeldia incana*	0.5	1.1	0.2	4
	MAMA8	*Marah macrocarpus*	0.5	0.3	0.2	1
	CLPE	*Claytonia perfoliata*	0.25	6.3	25	25
	FIGA	*Filago gallica*	0.25	1.0	4	4
	PTDR	*Pterostegia drymarioides*	0.25	1.0	4	4
	FICA2	*Filago californica*	0.25	0.8	3	3
	CAMIS	*Camissonia hirtella*	0.25	0.3	1	1
	CRMI2	*Cryptantha micromeres*	0.25	0.3	1	1
	POACXX	Poaceae	0.25	0.3	1	1
	POGL9	*Potentilla glandulosa*	0.25	0.3	1	1
	STBU	*Stachys bullata*	0.25	0.3	1	1
	BRTE	*Bromus tectorum*	0.25	0.1	0.2	0.2
	DICA14	*Dichelostemma capitatum*	0.25	0.1	0.2	0.2

***Ceanothus oliganthus* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Herbaceous						
	LASE	*Lactuca serriola*	0.25	0.1	0.2	0.2
	MICA3	*Mimulus cardinalis*	0.25	0.1	0.2	0.2
	NALE2	*Nassella lepida*	0.25	0.1	0.2	0.2
	PHPA3	*Phacelia parryi*	0.25	0.1	0.2	0.2
	SOOL	*Sonchus oleraceus*	0.25	0.1	0.2	0.2
	URDI	*Urtica dioica*	0.25	0.1	0.2	0.2
Cryptogam						
	MOSS	*Moss*	0.25	0.3	1	1

***Ceanothus verrucosus* Alliance (White Coast Ceanothus)**

ASSOCIATIONS

Ceanothus verrucosus-Xylococcus bicolor

LOCAL VEGETATION DESCRIPTION
Stands of *Ceanothus verrucosus* Shrubland form an intermittent to continuous shrub layer (56-86%, mean 68%) at 1-5 m tall, where *Ceanothus verrucosus* dominates. The herbaceous layer is sparse to open (0.2-20%, mean 7.6%) at 0-0.5m tall. Total vegetation cover is 65-86%, mean 70.5%.

In the *Ceanothus verrucosus-Xylococcus bicolor* Association, *Ceanothus verrucosus* dominates while *Xylococcus bicolor* and *Salvia mellifera* are characteristically present in lower cover. *Adenostoma fasciculatum* and *Malosma laurina* are often present in low cover. Non-natives *Bromus madritensis* and *Brassica* spp. are often dominant in the herbaceous layer, while the native *Marah macrocarpus* is often present in low cover. This is the first time this alliance has been described, and it is formerly considered part of the southern maritime chaparral of Holland (1986).

Quercus dumosa, a CNPS List 1B species, was found in 1 of 4 surveys of the *Ceanothus verrucosus* Alliance. Further, *Ceanothus verrucosus,* in all surveys, is a CNPS List 2 species (CNPS 2005). See Appendix 3 for more information on these plants.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 410-626 ft, mean 543 ft
Aspect: often SE, occasionally NW or NE
Slope: somewhat steep to steep, range 15-27 degrees, mean 20.3 degrees
Topography: often undulating, occasionally convex or concave, lower to upper slope
Litter Cover: range 84.7-85%, mean 84.7%
Rock Cover: range 5%, mean 5%
Bare Ground: range 5%, mean 5%
Parent Material: often metavolcanic, occasionally Mesozoic granite
Soil Texture: medium to very fine sandy loam, moderately coarse sandy loam, or moderately fine sandy clay loam

The *Ceanothus verrucosus* Alliance was sampled only within the Coastal Hills (261Bi) Subsection, on steep northerly or neutral slopes around and west of Lake Hodges.

Samples used to describe alliance: (n=4) SDRP0056, SDRP0057, SDRP0128, SDRP0332

RANK: G2 S2

GLOBAL DISTRIBUTION
Alliance: Coastal terraces and hills of San Diego County, particularly within the lower San Dieguito River watershed

Ceanothus verrucosus-Xylococcus bicolor Association: distribution same as alliance

REFERENCES
Holland 1986, Reiser 2001, CNPS unpublished transect data (1993-1995)

***Ceanothus verrucosus* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	CEVE2	*Ceanothus verrucosus*	1	48	27	65
	XYBI	*Xylococcus bicolor*	1	11.8	3	20
	SAME3	*Salvia mellifera*	1	1.6	0.2	4
	ADFA	*Adenostoma fasciculatum*	0.8	4.8	1	10
	MALA6	*Malosma laurina*	0.8	2.3	1	5
	ERFA2	*Eriogonum fasciculatum*	0.5	1.3	0.2	5
	LOSC2	*Lotus scoparius*	0.5	0.1	0.2	0.2
	CNDU	*Cneoridium dumosum*	0.5	0.1	0.2	0.2
	RHIN2	*Rhus integrifolia*	0.5	0.1	0.2	0.2
	ARCA11	*Artemisia californica*	0.3	0.3	1	1
Herbaceous						
	BRMA3	*Bromus madritensis*	0.5	7	10	18
	BRASS2	*Brassica*	0.5	2	1	7
	GAVE3	*Gastridium ventricosum*	0.5	0.3	0.2	1
	MAMA8	*Marah macrocarpus*	0.5	0.1	0.2	0.2
	AVBA	*Avena barbata*	0.3	0.3	1	1

***Cercocarpus minutiflorus* Unique Stands (San Diego Mountain-mahogany)**

ASSOCIATIONS
None, unique stands only

LOCAL VEGETATION DESCRIPTION
This stand of *Cercocarpus minutiflorus* Shrubland forms a continuous shrub layer (85%), where *Cercocarpus minutiflorus* dominates. Shrubs are in two different strata, with low shrubs at 0.5-1m tall and tall shrubs at 2-5m tall. The herbaceous layer is sparse (0.2%) at 0-0.5m tall. Total vegetation cover is 85%.

In one sample, *Cercocarpus minutiflorus* was found as the dominant species, while *Salvia mellifera* is found in lower cover. Species diversity is relatively low in this sample. In other reconnaissance surveys, *C. minutiflorus* was found dominant in small localized stands.

Ceanothus verrucosus, a CNPS List 2 species (CNPS 2005), was found in the one survey of the *Cercocarpus minutiflorus* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 339 ft
Aspect: NE
Slope: gentle, 2 degrees
Topography: concave, bottom
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: alluvium and other deposits
Soil Texture: medium sand

The *Cercocarpus minutiflorus* Unique Stands were sampled only in the Coastal Terraces (261Bj) and Coastal Hills (261Bi) Subsections. Stands were small and localized on sandy, alluvial surfaces.

Samples used to describe alliance: (n=1) SDRP0247

RANK: G1 S1

GLOBAL DISTRIBUTION
Alliance: San Diego County in coastal terraces and coastal hills (though may also occur in the foothills)

REFERENCES
Beauchamp 1986

***Cercocarpus minutiflorus* Unique Stands**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	CEMI3	*Cercocarpus minutiflorus*	1	82	82	82
	SAME3	*Salvia mellifera*	1	4	4	4
	HASQ2	*Hazardia squarrosa*	1	1	1	1
	ARCA11	*Artemisia californica*	1	0.2	0.2	0.2
	CEVE2	*Ceanothus verrucosus*	1	0.2	0.2	0.2
	CNDU	*Cneoridium dumosum*	1	0.2	0.2	0.2

***Chilopsis linearis* Alliance (Desert Willow)**

ASSOCIATIONS
Chilopsis linearis

LOCAL VEGETATION DESCRIPTION
Stands of *Chilopsis linearis* Shrubland form an open shrub layer (7-20%, mean 13.4%) at 2-5m tall, where *Chilopsis linearis* dominates. The herbaceous layer is open to continuous (20-40%, mean 42%) at 0-0.5m tall. The tree layer is infrequently present and sparse at 5-15m tall (0-0.2%). Total vegetation cover is 27-73%, mean 51.3%.

In the *Chilopsis linearis* Association, *Chilopsis linearis* is dominant as a tall shrub in the overstory. Other shrub species occur at low cover including *Acacia greggii, Prosopis glandulosa, Sambucus mexicana* and *Baccharis salicifolius*. The herbaceous layer is comprised of a variety of native and non-native species and is dominated by species such as *Bromus madritensis, B. diandrus,* or *Lupinus bicolor.* The tree layer is infrequently present and includes *Quercus agrifolia.*

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, -2970 ft, mean 2631 ft
Aspect: flat or NE, sometimes SW
Slope: flat to gentle, 0-2 degrees, mean 0.8 degrees
Topography: flat to concave; bottom
Litter Cover: range 2.0-10%, mean 6.7%
Rock Cover: range 4.0-17%, mean 8.7%
Bare Ground: range 20.0-80%, mean 44.0%
Parent Material: alluvium and other deposits
Soil Texture: medium to very fine sandy loam, coarse sand, or medium sand

The *Chilopsis linearis* Alliance was sampled only within the Desert Slopes (M262Bp) Subsection, in the intermittently to seasonally flooded washes of San Felipe Valley.

Samples used to describe alliance: (n=5) SDRP0121, SFVW013, SFVW048, SFVW112, SFVW126

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance and *Chilopsis linearis* Association: Mojave Desert and Colorado Desert (including Joshua Tree National Park, Anza-Borrego Desert, and San Felipe Valley)

REFERENCES
CDFG 1998, Keeler-Wolf et al. 2004, Spolsky 1979, Thomas et al. 2004

***Chilopsis linearis* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	QUAG-t	*Quercus agrifolia*	0.2	0.0	0.2	0.2
Shrub						
	CHLI2	*Chilopsis linearis*	1	12.8	6	18
	ACGR	*Acacia greggii*	0.4	0.4	1	1
	OPPH	*Opuntia phaeacantha*	0.4	0.2	0.2	1
	PRGL2	*Prosopis glandulosa*	0.4	0.2	0.2	1
	SAME5	*Sambucus mexicana*	0.4	0.2	0.2	1
	BASA4	*Baccharis salicifolia*	0.4	0.1	0.2	0.2
	ERFA2	*Eriogonum fasciculatum*	0.2	0.0	0.2	0.2
	RHOV	*Rhus ovata*	0.2	0.0	0.2	0.2
	RIMA	*Ribes malvaceum*	0.2	0.0	0.2	0.2
	SAEX	*Salix exigua*	0.2	0.0	0.2	0.2
Herbaceous						
	ERCI6	*Erodium cicutarium*	1	3.2	0.2	8
	BRMA3	*Bromus madritensis*	0.8	19.8	4	35
	CRYPT	*Cryptantha*	0.8	0.3	0.2	1
	LUBI	*Lupinus bicolor*	0.6	7.4	0.2	35
	LUCO	*Lupinus concinnus*	0.6	0.1	0.2	0.2
	MEPO3	*Medicago polymorpha*	0.4	0.6	1	2
	BRDI3	*Bromus diandrus*	0.2	4.0	20	20
	BRTE	*Bromus tectorum*	0.2	3.6	18	18
	AMMEI2	*Amsinckia menziesii* var. *intermedia*	0.2	1.2	6	6
	HIIN3	*Hirschfeldia incana*	0.2	0.8	4	4
	ERSE3	*Eremocarpus setigerus*	0.2	0.4	2	2
	SISYM	*Sisymbrium*	0.2	0.2	1	1
	ARDI5	*Aristida divaricata*	0.2	0.0	0.2	0.2
	BRAR3	*Bromus arenarius*	0.2	0.0	0.2	0.2
	BRTO	*Brassica tournefortii*	0.2	0.0	0.2	0.2
	CAMIS	*Camissonia*	0.2	0.0	0.2	0.2
	CLPE	*Claytonia perfoliata*	0.2	0.0	0.2	0.2
	DAWR2	*Datura wrightii*	0.2	0.0	0.2	0.2
	ERGR5	*Eriogonum gracile*	0.2	0.0	0.2	0.2
	ERIOG	*Eriogonum*	0.2	0.0	0.2	0.2
	GILIA	*Gilia*	0.2	0.0	0.2	0.2
	LAMIU	*Lamium*	0.2	0.0	0.2	0.2
	PLAR	*Plagiobothrys arizonicus*	0.2	0.0	0.2	0.2

***Dendromecon rigida* Alliance (Bush Poppy)**

ASSOCIATIONS
Dendromecon rigida

LOCAL VEGETATION DESCRIPTION
Stands of *Dendromecon rigida* Shrubland form an open to intermittent shrub layer (18-28%, mean 24.0%), where *Dendromecon rigida* dominates. Shrubs occur in two different strata, with low shrubs at 0.5-1m tall and tall shrubs at 1-2m tall. The herbaceous layer is sparse (0.2-1%, mean 1.0%) at 0-0.5m tall. Total vegetation cover is 18-28%, mean 24.3%.

In the *Dendromecon rigida* Association, *Dendromecon rigida* is the main dominant shrub in the overstory. It reproduces readily (or germinates from an existing seed bank) after fires, and it persists for around 10 years in stands. All four stands sampled have *Adenostoma fasciculatum, Ceanothus greggii,* and *Rhus ovata* present at low cover. The herbaceous layer is relatively sparse, and includes disturbance-following species such as *Dicentra chrysantha* and *Helianthus gracilentus.*

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 2961-3133 ft, mean 3074 ft
Aspect: NE
Slope: moderate to somewhat steep, range 8-21 degrees, mean 14.7 degrees
Topography: convex; lower to upper slopes
Litter Cover: range 2-12%, mean 8.0%
Rock Cover: range 22-43%, mean 32.3%
Bare Ground: range 43-75%, mean 61.7%
Parent Material: mixed granitic and metamorphic
Soil Texture: loam (moderately fine clay loam, fine silt loam, or medium loam)

The *Dendromecon rigida* Alliance was sampled on moderate to somewhat steep, north-trending slopes within the Palomar - Cuyamaca Peak (M262Bo) Subsection along Volcan Mountain in areas recently burned by the Pines Fire of 2002. It is typically an ephemeral, post-fire alliance that exists for around 10 years, occurring in many chaparral types following fire. Over a period of years, *Dendromecon* is replaced by *Adenostoma fasciculatum, Ceanothus* spp., and other chaparral shrub species.

Similarly, in Yosemite National Park, stands with *D. rigida* dominant occurred with *A. fasciculatum* sub-dominant*;* however, they were considered an association of the *Adenostoma fasciculatum* alliance.

Samples used to describe alliance: (n=3) SFVW053, SFVW054, SFVW094

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance and *Dendromecon rigida* Association: South Coast, Transverse and Peninsular Ranges (from Ventura to San Diego County); though full distribution is expected to be found throughout California from the foothills of the Klamath Mountains south (including the Sierra Nevada) to Southern California

REFERENCES
CNPS and CDFG 2005b, NatureServe et al. 2003b

***Dendromecon rigida* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	DERI	*Dendromecon rigida*	1	17.3	10	22
	ADFA	*Adenostoma fasciculatum*	1	4.3	3	5
	CEGR	*Ceanothus greggii*	1	1.3	1	2
	RHOV	*Rhus ovata*	1	0.3	0.2	0.2
	MADE	*Malacothamnus densiflorus*	0.7	0.1	0.2	0.2
	ERCO25	*Eriophyllum confertiflorum*	0.3	0.1	0.2	0.2
	HESC2	*Helianthemum*	0.3	0.1	0.2	0.2
	PRIL	*Prunus ilicifolia*	0.3	0.1	0.2	0.2
	TRPA3	*Trichostema parishii*	0.3	0.1	0.2	0.2
Herbaceous						
	DICH	*Dicentra chrysantha*	0.7	0.7	1	1
	HEGR3	*Helianthus gracilentus*	0.7	0.1	0.2	0.2
	BRMA3	*Bromus madritensis*	0.3	0.1	0.2	0.2
	CAMIS	*Camissonia*	0.3	0.1	0.2	0.2
	CRYPT	*Cryptantha*	0.3	0.1	0.2	0.2
	SCHIS	*Schismus*	0.3	0.1	0.2	0.2

***Encelia californica* Alliance (California Encelia)**

ASSOCIATIONS
Encelia californica-Artemisia californica
Encelia californica-Artemisia californica-Salvia mellifera-Baccharis pilularis

LOCAL VEGETATION DESCRIPTION
Stands of *Encelia californica* Shrubland form a sparse to continuous shrub layer (2-75%, mean 30%), where *Encelia californica* dominates or co-dominates. Shrubs occasionally occur 0.5-5m tall. The herbaceous layer is sparse to open (0.2-11%, mean 6.1%) at 0-2m tall. Total vegetation cover is 13-75%, mean 34.3%.

In the *Encelia californica-Artemisia californica* Association, *Encelia californica* and *Artemisia californica* are co-dominant in the shrub layer. *Hirschfeldia incana* or *Bromus madritensis* may dominate the herbaceous layer.

In the *Encelia californica-Artemisia californica-Salvia mellifera-Baccharis pilularis* Association, *Encelia californica, Artemisia californica, Salvia mellifera,* and *Baccharis pilularis* co-dominate in the shrub layer. *Bromus madritensis* may dominate the herbaceous layer.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 250-455 ft, mean 320 ft
Aspect: SE, SW, or NW
Slope: gentle to steep, range 2-30 degrees, mean 16.7 degrees
Topography: undulating, concave or flat, bottom or lower slopes
Litter Cover: 0%, mean 0% (from one plot)
Rock Cover: 7%, mean 7% (from one plot)
Bare Ground: 87%, mean 87% (from one plot)
Parent Material: mixed alluvium
Soil Texture: medium to very fine sandy loam

The *Encelia californica* Alliance was sampled only in western portion of the study area in the Coastal Terraces (261Bj) and Coastal Hills (261Bi) Subsections on bottom or lower alluvial slopes

Samples used to describe alliance: (n=3) SDRP0321, SDRP0353, SDRP0354

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

GLOBAL DISTRIBUTION
Alliance: southern outer Central Coast, South Coast (including Ventura County south to W Riverside and San Diego Counties), western Transverse Ranges (including Santa Monica Mountains), Channel Islands

Encelia californica-Artemisia californica Association: South Coast (including Ventura to Riverside and San Diego Counties on coastal valleys, hills, and terraces), western Transverse Ranges (including Santa Monica Mountains)
Encelia californica-Artemisia californica-Salvia mellifera-Baccharis pilularis Association*:* South Coast (San Diego County on coastal terraces), though full distribution is not known

REFERENCES
CNPS and CDFG 2005b, Klein and Evens 2005, Malanson 1984, Sawyer and Keeler-Wolf 1995

***Encelia californica* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	ENCA	*Encelia californica*	1	10.3	1	28
	ARCA11	*Artemisia californica*	1	9.4	0.2	25
	LOSC2	*Lotus scoparius*	1	1.5	0.2	4
	SAME3	*Salvia mellifera*	0.7	8.3	5	20
	BAPI	*Baccharis pilularis*	0.7	7	1	20
	ERFA2	*Eriogonum fasciculatum*	0.7	0.1	0.2	0.2
	OPLI3	*Opuntia littoralis*	0.7	0.1	0.2	0.2
	ATRIP	*Atriplex*	0.3	0.7	2	2
	ERICA2	*Ericameria*	0.3	0.3	1	1
	SAAP2	*Salvia apiana*	0.3	0.3	1	1
Herbaceous						
	BRMA3	*Bromus madritensis*	0.7	2.7	1	7
	HIIN3	*Hirschfeldia incana*	0.3	3.7	11	11
	COSE4	*Cortaderia selloana*	0.3	0.7	2	2
Cryptogam						
	MOSS	Moss	0.3	0.3	1	1

***Eriogonum fasciculatum* Alliance (California Buckwheat)**

ASSOCIATIONS
Eriogonum fasciculatum
Eriogonum fasciculatum-Rhus ovata

LOCAL VEGETATION DESCRIPTION
Stands of *Eriogonum fasciculatum* Shrubland form an open to intermittent shrub layer (7-55%, mean 21.8%), where *Eriogonum fasciculatum* dominates. Shrubs occur 0.5-5m tall. The herbaceous layer is sparse to intermittent (1-57%, mean 21.8%) at 0-0.5m tall. Trees seldom occur as emergents (0.2% cover, mean 0.2%) at 1-2m tall. Total vegetation cover is 19-64%, mean 40.3%.

In the *Eriogonum fasciculatum* Association, other shrubs are absent or in very low cover while the herbaceous layer is dominated by non-native species such as *Hirschfeldia incana, Erodium* spp., *Bromus* spp, and *Avena* spp.

In the *Eriogonum fasciculatum-Rhus ovata* Association, *Rhus ovata* is present to co-dominant. *Prunus fremontii* and *Prosopis glandulosa* are often present. The herbaceous layer is dominated by *Bromus madritensis* and other non-native species such as *Hirschfeldia incana*, *Erodium* spp. and *Avena barbata*.

Ceanothus verrucosus, a CNPS List 2 species (CNPS 2005), was found in 1 of 11 surveys of the *Eriogonum fasciculatum* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 422-2881 ft, mean 1866.5 ft
Aspect: more often NE, occasionally SE or SW
Slope: gentle to steep, range 2-30 degrees, mean 15.1 degrees
Topography: undulating or convex, usually lower slope, sometimes middle to upper slope
Litter Cover: 25% (one sample)
Rock Cover: 10% (one sample)
Bare Ground: 62% (one sample)
Parent Material: often alluvium and other deposits, occasionally Mesozoic granite or metamorphic
Soil Texture: more often medium to very fine sandy loam, occasionally coarse sand or loamy sand

The *Eriogonum fasciculatum* Alliance was sampled in the Coastal Hills (261Bi), Western Granitic Foothills (M262Bn), and Desert Slopes (M262Bp) Subsections, usually on alluvial/depositional, lower slopes that are undulating or convex. All stands denote recent disturbance from fire, grazing, erosion, foot traffic, etc.

Samples used to describe alliance: (n=11) SDRP0029, SDRP0074, SDRP0083, SDRP0088, SDRP0101, SDRP0112, SDRP0116, SDRP0119, SDRP0165, SDRP0166, SFVW033

RANK: G2 S3 and 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, Los Angeles, W Riverside, and San Diego Counties), Channel Islands, Mojave Desert, Colorado Desert (including Anza-Borrego Desert), Baja California

Eriogonum fasciculatum/Annual Grass-Herb Association: South Coast to Transverse and Peninsular Ranges (coastal hills/valleys to interior mountains of Ventura and Los Angeles to W Riverside and San Diego Counties)

Eriogonum fasciculatum-Rhus ovata Association: Peninsular Ranges (including W Riverside: San Jacinto Mountains and foothills, San Diego County: western foothills), Colorado Desert (San Diego County: desert slopes)

REFERENCES

Borchert et al. 2004, CDFG 1998, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Klein and Evens 2005, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004

***Eriogonum fasciculatum* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	ERFA2	*Eriogonum fasciculatum*	1	14.4	6	35
	RHOV	*Rhus ovata*	0.5	1.7	0.2	10
	SAAP2	*Salvia apiana*	0.5	0.5	0.2	3
	ARCA11	*Artemisia californica*	0.5	0.5	0.2	3
	YUWH	*Yucca whipplei*	0.5	0.1	0.2	0.2
	PRFR	*Prunus fremontii*	0.4	0.5	0.2	3
	GUSA2	*Gutierrezia sarothrae*	0.4	0.1	0.2	1
	ACGR	*Acacia greggii*	0.3	0.5	0.2	4
	ISME5	*Isocoma menziesii*	0.3	0.3	0.2	3
	CEGR	*Ceanothus greggii*	0.3	0.2	0.2	2
	ADFA	*Adenostoma fasciculatum*	0.3	0.1	0.2	1
	PRGL2	*Prosopis glandulosa*	0.3	0.1	0.2	0.2
Herbaceous						
	BRMA3	*Bromus madritensis*	0.8	7.7	0.2	35
	HIIN3	*Hirschfeldia incana*	0.5	0.1	0.2	0.2
	AVBA	*Avena barbata*	0.5	1.3	0.2	12
	ERODI	*Erodium (brachycarpum botrys,* and *moschatum)*	0.3	5.3	18	22
	ERCI6	*Erodium cicutarium*	0.3	0.4	0.2	4
	BRDI3	*Bromus diandrus*	0.3	0.2	0.2	1
	ERSE3	*Eremocarpus setigerus*	0.3	0.1	0.2	0.
	ERBR3	*Erodium brachycarpum*	0.2	1.2	1	12
	BROMU	*Bromus*	0.2	0.9	5	5
	NAPU4	*Nassella pulchra*	0.2	0.6	1	5
	BRHO2	*Bromus hordeaceus*	0.2	0.5	2	3
	BRAR3	*Bromus arenarius*	0.2	0.3	0.2	3
	CRIN8	*Cryptantha intermedia*	0.2	0.2	0.2	2
	PHDI	*Phacelia distans*	0.2	0.2	0.2	2
	CRYPT	*Cryptantha*	0.2	0.1	0.2	1
	FILAG	*Filago*	0.2	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 (15-57%, mean 33.2%) at 0.5-2m tall, where *Eriogonum fasciculatum* and *Salvia apiana* co-dominate. The herbaceous layer is open (15-28%, mean 22.7%) at 0-0.5m tall. Trees occasionally occur as emergents (0.2-0% cover, mean 0.2%) at 5-10m tall. Total vegetation cover is 30-80%, mean 47.8%.

In the *Eriogonum fasciculatum-Salvia apiana* Association, *Eriogonum fasciculatum* and *Salvia apiana* co-dominate. Other shrubs such as *Gutierrezia californica*, *Artemisia californica,* or *Malosma laurina* may be sub-dominant in some stands. The shrub overstory is diverse in a stand sampled on a desert slope, with *Prunus fremontii, Viguiera parishii,* and *Opuntia acanthocarpa* present while *Eriogonum fasciculatum* and *Salvia apiana* exhibit higher cover. The herbaceous layer is often dominated by non-native species such as *Avena barbata, Bromus hordeaceus,* and *B. madritensis* and natives such as *Calochortus* sp*. Nassella pulchra* is dominant in stands where non-native species are less abundant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 482-3022 ft, mean 1763.3 ft
Aspect: variable but more often SW
Slope: somewhat steep, range 15-40 degrees, mean 21.7 degrees
Topography: often undulating or convex; lower to upper slope
Litter Cover: range 5-67%, mean 36.7%
Rock Cover: range 1.2-30%, mean 16.3%
Bare Ground: range 27-67%, mean 42.3%
Parent Material: often Mesozoic granite, occasionally metamorphic
Soil Texture: moderately fine sandy clay loam, medium to very fine sandy loam, or coarse loamy sand

The *Eriogonum fasciculatum-Salvia apiana* Alliance was sampled in the Western Granitic Foothills (M262Bn) Subsection from the Pamo Canyon area to Santa Ysabel Ranch. It also is found on the lower exposed Desert Slopes (M262Bp) Subsections along Banner Grade of Volcan Mountain.

Samples used to describe alliance: (n=6) SDRP0037, SDRP0161, SDRP0170, SDRP0188, SDRP0195, SFVW011

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

GLOBAL DISTRIBUTION
Alliance: South Coast, Transverse Ranges (Santa Monica Mountains: Simi Hills and eastward), Peninsular Ranges (including W Riverside and San Diego Counties), Colorado Desert (including Anza-Borrego Desert), Baja California

Eriogonum fasciculatum-Salvia apiana Association: South Coast (Western Riverside County: Perris Valley Hills and Fontana Plains - Calimesa Terraces Subsections), Peninsular Ranges (W Riverside County: Santa Ana and San Jacinto Mountains; San Diego County: western foothills)

REFERENCES
Boyd et al. 1995, CDFG 1998, CNPS and CDFG 2005b, Gordon and White 1994, Klein and Evens 2005, Sawyer and Keeler-Wolf 1995, Sproul 2001

***Eriogonum fasciculatum-Salvia apiana* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	SAAP2	*Salvia apiana*	1	15.7	3	45
	ERFA2	*Eriogonum fasciculatum*	1	12.5	4	30
	GUSA2	*Gutierrezia sarothrae*	0.7	1.4	0.2	5
	ARCA11	*Artemisia californica*	0.5	1.9	0.2	10
	MALA6	*Malosma laurina*	0.3	2.5	1	14
	RHCR	*Rhamnus crocea*	0.3	0.7	1	3
	YUWH	*Yucca whipplei*	0.3	0.1	0.2	0.2
Herbaceous						
	BRMA3	*Bromus madritensis*	0.7	2.3	1	8
	BRHO2	*Bromus hordeaceus*	0.5	2.7	1	10
	CEME2	*Centaurea melitensis*	0.5	1.0	0.2	4
	AVBA	*Avena barbata*	0.3	4.5	1	26
	CALOC	*Calochortus*	0.3	0.1	0.2	0.2

***Eriogonum wrightii* Alliance (Wright's Buckwheat)**

ASSOCIATIONS
Eriogonum wrightii-Lessingia filaginifolia

LOCAL VEGETATION DESCRIPTION
Stands of *Eriogonum wrightii* Shrubland form an open shrub layer (12-32%, mean 19.3%), where *Eriogonum wrightii* dominates or co-dominates. The herbaceous layer is sparse to intermittent (5-48%, mean 29%). Trees occasionally occur as emergents (0.2% cover, mean 0.2%). Total vegetation cover is 35-65%, mean 47.5%.

In the *Eriogonum wrightii-Lessingia filaginifolia* Association, *Eriogonum wrightii* dominates in the shrub layer while *Lessingia filaginifolia* is dominant in the herbaceous layer. The herbaceous layer also may be co-dominated by non-native species such as *Bromus* spp. and *Avena barbata*, while the native species *Achillea millefolium* is often present in low cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4244-5386 ft, mean 4921 ft
Aspect: often SW, occasionally NW
Slope: gentle to somewhat steep, range 5-15 degrees, mean 10.8 degrees
Topography: often convex, middle to upper slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed granitic and metamorphic
Soil Texture: medium sand

The *Eriogonum wrightii* Alliance was sampled within in the Palomar - Cuyamaca Peak (M262Bo) Subsection, occurring from Santa Ysabel Ranch to Volcan Mountain. It occurs in small, dry meadows on gentle to somewhat steep, southerly or neutral slopes that are often convex.

Samples used to describe alliance: (n=4) SDRP0018, SDRP0206, SDRP0214, SDRP0228

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: inner Central Coast and Central Valley (including San Benito and adjacent W Fresno County), inner N Coast Range foothills (T. Keeler-Wolf, personal communication), Peninsular Ranges (including W Riverside County: San Jacinto Mountains, San Diego County: Palomar - Cuyamaca Peak region), Mojave Desert (J. Evens personal observation), Colorado Desert (including Anza-Borrego Desert), though full distribution is not known

Eriogonum wrightii-Lessingia filaginifolia Association: mountains of San Diego County including the Palomar - Cuyamaca Peak region, though full distribution is not known

REFERENCES
CDFG 1998, CNPS and CDFG 2005a, Klein and Evens 2005, Moran 2004

***Eriogonum wrightii* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	ERWR	*Eriogonum wrightii*	1	18.5	12	30
	ERCO25	*Eriophyllum confertiflorum*	0.3	0.5	2	2
	TODI	*Toxicodendron diversilobum*	0.3	0.3	1	1
	RHTR	*Rhus trilobata*	0.3	0.3	1	1
	ERFA2	*Eriogonum fasciculatum*	0.3	0.3	1	1
Herbaceous						
	LEFI11	*Lessingia filaginifolia*	1	15.5	2	45
	AVBA	*Avena barbata*	1	3.8	1	10
	BRDI3	*Bromus diandrus*	1	0.7	0.2	2
	BRTE	*Bromus tectorum*	0.8	2.1	0.2	8
	BRHO2	*Bromus hordeaceus*	0.8	0.4	0.2	1
	ACMI2	*Achillea millefolium*	0.8	0.2	0.2	0.2
	ELGL	*Elymus glaucus*	0.5	0.6	0.2	2
	SIMAS	*Sidalcea malviflora* subsp. *sparsifolia*	0.5	0.6	0.2	2
	KOMA	*Koeleria macrantha*	0.5	0.3	0.2	1
	ERSE3	*Eremocarpus setigerus*	0.5	0.1	0.2	0.2
	HIIN3	*Hirschfeldia incana*	0.5	0.1	0.2	0.2
	ERFO2	*Erigeron foliosus*	0.5	0.1	0.2	0.2
	ARPU9	*Aristida purpurea*	0.3	1.8	7	7
	SIBE	*Sisyrinchium bellum*	0.3	1.5	6	6
	SABI3	*Sanicula bipinnatifida*	0.3	0.5	2	2
	BRMA3	*Bromus madritensis*	0.3	0.3	1	1
	LUEX	*Lupinus excubitus*	0.3	0.3	1	1
	CASP	*Calochortus splendens*	0.3	0.3	1	1
	AMPS	*Ambrosia psilostachya*	0.3	0.3	1	1
	CRIN8	*Cryptantha intermedia*	0.3	0.3	1	1
	PLER3	*Plantago erecta*	0.3	0.3	1	1

***Gutierrezia sarothrae* Alliance (Matchweed Alliance)**

ASSOCIATIONS
Gutierrezia sarothrae-Erodium spp.-*Nassella pulchra*

LOCAL VEGETATION DESCRIPTION
Stands of *Gutierrezia sarothrae* Shrubland form an open shrub layer (17-26%, mean 20.3%) at 0-0.5m tall. *Gutierrezia sarothrae* usually dominates, or it co-dominates with *Eriogonum fasciculatum*. The herbaceous layer is intermittent (38-45%, mean 41%) at 0-0.5m tall. Total vegetation cover is 45-63%, mean 56%.

In the *Gutierrezia sarothrae-Erodium* spp.-*Nassella pulchra* Association, *Gutierrezia* is the dominant shrub. *Eriogonum fasciculatum* may sometimes be present and a co-dominant. While the herbaceous layer is dominated by non-native species such as *Erodium* spp., *Bromus hordeaceus,* and *Avena barbata*, *Nassella pulchra* is consistently present.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3553-3874 ft, mean 3699 ft
Aspect: SW
Slope: moderate to somewhat steep, range 6-15 degrees, mean 12.0 degrees
Topography: convex, concave, or undulating, bottom to middle slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mostly mixed granitic and metamorphic, occasionally schist
Soil Texture: moderately coarse sandy loam

The *Gutierrezia sarothrae* Alliance was sampled in the Western Granitic Foothills (M262Bn) and Palomar - Cuyamaca Peak (M262Bo) Subsections in the Santa Ysabel Ranch to Volcan Mountain areas. It occurs particularly on disturbed, exposed southerly aspects in slope draws to middle slopes.

Samples used to describe alliance: (n=3) SDRP0004, SDRP0006, SDRP0180

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: southern Peninsular Ranges (San Diego County: western foothills and Palomar - Cuyamaca Peak region), Mojave Desert (J. Evens, personal observation)

Gutierrezia sarothrae-Erodium spp.-*Nassella pulchra* Association: southern Peninsular Ranges (San Diego County: western foothills and Palomar - Cuyamaca Peak region), though full distribution is not known

REFERENCES
Moran 2004

***Gutierrezia sarothrae* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	GUSA2	*Gutierrezia sarothrae*	1	18	12	25
	ERFA2	*Eriogonum fasciculatum*	0.7	2.3	1	6
Herbaceous						
	ERODI	*Erodium (brachycarpum, botrys, and moschatum)*	1	19.7	12	27
	NAPU4	*Nassella pulchra*	1	4.5	1	8
	BRHO2	*Bromus hordeaceus*	1	2.4	0.2	6
	AVBA	*Avena barbata*	1	0.2	0.2	0.2
	BRMA3	*Bromus madritensis*	0.7	2.7	3	5
	LEFI11	*Lessingia filaginifolia*	0.7	2.3	3	4
	BRDI3	*Bromus diandrus*	0.7	1	1	2
	STGN	*Stylocline gnaphalioides*	0.7	0.1	0.2	0.2
	ARPU9	*Aristida purpurea*	0.3	2.3	7	7
	AMPS	*Ambrosia psilostachya*	0.3	1.3	4	4
	IPOMO2	*Ipomopsis*	0.3	1	3	3
	CAMA24	*Calystegia macrostegia*	0.3	0.3	1	1
	PLANT	*Plantago*	0.3	0.3	1	1
	PLANT	*Plantago (patagonica)*	0.3	0.3	1	1
	CASP	*Calochortus splendens*	0.3	0.3	1	1
	SABI3	*Sanicula bipinnatifida*	0.3	0.3	1	1

***Isocoma menziesii* Alliance (Goldenbush)**

ASSOCIATIONS
Isocoma menziesii

LOCAL VEGETATION DESCRIPTION
Stands of *Isocoma menziesii* Shrubland form a sparse to open shrub layer (5-24%, mean 13.7%) at 0-0.5m tall, where *Isocoma menziesii* dominates. The herbaceous layer is open to continuous (10-90%, mean 45.7%) at 0-1m tall. Total vegetation cover is 18-92%, mean 56.7%.

In the *Isocoma menziesii* Association, *Isocoma menziesii* dominates in the shrub layer. The understory herbaceous layer is dominated by non-native species such as *Bromus diandrus, B. madritensis, B. hordeaceus, Hirschfeldia incana,* and *Erodium* spp.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 19-414 ft, mean 268 ft
Aspect: Flat, SW or SE
Slope: flat to moderate range 0-10 degrees, mean 4.0 degrees
Topography: often flat, occasionally convex
Litter Cover: range 39.3-89%, mean 64.3%
Rock Cover: range 0.4-0%, mean 0.4%
Bare Ground: range 5-55%, mean 30%
Parent Material: alluvium and other deposits, including Mesozoic granite origin
Soil Texture: loam or sandy clay loam

The *Isocoma menziesii* Alliance was sampled in the Coastal Terraces (261Bj) and Western Granitic Foothills (M262Bn) Subsections on alluvial surfaces that appear recently disturbed and sometimes riparian in nature. This is an “early seral” alliance similar to *Hazardia squarrosa* in southern California

Samples used to describe alliance: (n=3) SDRP0076, SDRP0242, SDRP0337

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance and *Isocoma menziesii* Association: South Coast and Peninsular Ranges (including Western Riverside: coastal hills and valleys, and San Diego Counties: coastal terraces and western foothills)

REFERENCES
Bramlet 1994

***Isocoma menziesii* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	ISME5	*Isocoma menziesii*	1	12.7	7	23
	SNAG	*Standing snag*	0.3	4	12	12
	SAVI	*Salicornia virginica*	0.3	1.7	5	5
	GUCA	*Gutierrezia californica*	0.3	1.3	4	4
	BASA2	*Baccharis sarothroides*	0.3	0.3	1	1
Herbaceous						
	BRDI3	*Bromus diandrus*	0.7	8.7	1	25
	BRMA3	*Bromus madritensis*	0.7	8.3	5	20
	BRHO2	*Bromus hordeaceus*	0.3	20	60	60
	HIIN3	*Hirschfeldia incana*	0.3	4	12	12
	HORDE	*Hordeum*	0.3	3.3	10	10
	GALIU	*Galium*	0.3	2	6	6
	CEME2	*Centaurea melitensis*	0.3	2	6	6
	ERODI	*Erodium (brachycarpum, botrys, and moschatum)*	0.3	1.3	4	4
	DISP	*Distichlis spicata*	0.3	0.7	2	2
	ERSE3	*Eremocarpus setigerus*	0.3	0.3	1	1

***Keckiella antirrhinoides* Alliance (Bush Penstemon)**

ASSOCIATIONS
Keckiella antirrhinoides-Artemisia californica
Keckiella antirrhinoides-Mixed chaparral

LOCAL VEGETATION DESCRIPTION
Stands of *Keckiella antirrhinoides* Shrubland form an open to continuous shrub layer (25-60%, mean 43.6%) at 1-2m tall, where *Keckiella antirrhinoides* dominates or co-dominates. The herbaceous layer, when present, is sparse to intermittent (0-50%, mean 22.9%) at 0-1m tall. Trees infrequently occur as emergents (0.2% cover, mean 0.2%) at 2-10m tall, including *Quercus engelmannii*. Total vegetation cover is 37-78%, mean 56.3%.

In the *Keckiella antirrhinoides-Artemisia californica* Association, *Artemisia californica* is sub-dominant to co-dominant with *Keckiella antirrhinoides.* Other coastal sage species may be present at low cover, including *Eriogonum fasciculatum, Malosma laurina, Salvia apiana,* and *Mimulus aurantiacus.* The herbaceous layer is diverse, often including non-native species, such as *Bromus madritensis* and *Hirschfeldia incana,* and native species, such as *Pterostegia drymarioides* and *Daucus pusillus.*

In the *Keckiella antirrhinoides*-Mixed chaparral Association, chaparral species such as *Adenostoma fasciculatum* and *Xylococcus bicolor* are sub-dominant to co-dominant with *Keckiella antirrhinoides.* Other shrubs at low cover may include *Cneoridium dumosum, Artemisia californica,* and *Eriogonum fasciculatum.* The herbaceous layer is diverse, often including non-native species, such as *Avena* spp. and *Filago gallica,* and native species, such as *Chaenactis glabriuscula* and *Camissonia* spp.

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 1 of 9 surveys of the *Keckiella antirrhinoides* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 301-1330 ft, mean 857 ft
Aspect: variable but more often NW
Slope: gentle to steep range 4-33 degrees, mean 21.4 degrees
Topography: often convex, occasionally undulating
Litter Cover: range 15-65%, mean 40%
Rock Cover: range 8-20%, mean 13.5%
Bare Ground: range 15-61%, mean 41.5%
Parent Material: Mesozoic granite
Soil Texture: often medium to very fine sandy loam, occasionally medium loam or moderately fine clay loam

The *Keckiella antirrhinoides* Alliance was sampled in the Coastal Hills (261Bi) and Western Granitic Foothills (M262Bn) Subsections, especially around Lake Hodges east to Pamo Valley area on northerly aspects in transition between coastal sage scrub and chaparral.

Samples used to describe alliance: (n=9) SDRP0070, SDRP0084, SDRP0135, SDRP0318, SDRP0429, SDRP0456, SDRP0463, SDRP0464, SDRP0466

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: South Coast (including coastal hills and valleys in W Riverside and San Diego Counties), Peninsular Ranges (including W Riverside County: Santa Ana and San Jacinto Mountains; San Diego

County: western foothills),

Keckiella antirrhinoides-Artemisia californica Association: distribution same as alliance
Keckiella antirrhinoides-Mixed chaparral Association: South Coast and Peninsular Ranges (W Riverside County: Perris Valley and hills, San Jacinto foothills; San Diego County: western foothills)

REFERENCES
Gordon and White 1994, Klein and Evens 2005

***Keckiella antirrhinoides* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	KEAN	*Keckiella antirrhinoides*	1	19.9	5	45
	ARCA11	*Artemisia californica*	0.9	11.1	1	26
	MALA6	*Malosma laurina*	0.7	1.8	0.2	5
	ERFA2	*Eriogonum fasciculatum*	0.7	1.2	1	3
	ADFA	*Adenostoma fasciculatum*	0.6	4.2	2	20
	CNDU	*Cneoridium dumosum*	0.6	2.4	1	9
	SAAP2	*Salvia apiana*	0.6	2.2	0.2	15
	MIAU	*Mimulus aurantiacus*	0.4	0.8	0.2	3
	XYBI	*Xylococcus bicolor*	0.3	1.7	2	8
Herbaceous						
	BRMA3	*Bromus madritensis*	0.7	4.8	1	15
	HIIN3	*Hirschfeldia incana*	0.7	1.8	0.2	6
	PTDR	*Pterostegia drymarioides*	0.3	2.1	4	10
	FIGA	*Filago gallica*	0.3	1.7	2	7
	CEME2	*Centaurea melitensis*	0.3	0.7	0.2	6
	BRDI3	*Bromus diandrus*	0.3	0.7	0.2	5
	BRTE	*Bromus tectorum*	0.2	5	20	25
	DAPU3	*Daucus pusillus*	0.2	0.8	1	6
	CHGL	*Chaenactis glabriuscula*	0.2	0.7	3	3
	BRHO2	*Bromus hordeaceus*	0.2	0.4	0.2	3
	MAMA8	*Marah macrocarpus*	0.2	0.2	0.2	2
	CLPE	*Claytonia perfoliata*	0.2	0.2	1	1
	AVFA	*Avena fatua*	0.2	0.2	1	1
Cryptogam						
	LICHEN	Lichen	0.2	1.2	1	10

***Lotus scoparius* Alliance (Deerweed)**

ASSOCIATIONS
Lotus scoparius

LOCAL VEGETATION DESCRIPTION
Stands of *Lotus scoparius* Shrubland form a sparse to intermittent shrub layer (7-35%, mean 21.4%), where *Lotus scoparius* dominates. Shrubs often occur in two different strata, with low shrubs dominant at 0-2m tall and tall shrubs present at 0-5m tall. The herbaceous layer is sparse to open (6-51%, mean 19.1%) at 0-0.5m tall. Total vegetation cover is 8.0-75%, mean 37.8%.

In the *Lotus scoparius* Association, *Lotus scoparius* is dominant*. Artemisia californica, Eriogonum fasciculatum,* and *Lessingia filaginifolia* may be present but in low cover. The herbaceous layer is diverse and often includes non-native species, such as *Centaurea melitensis*, *Erodium* spp., and *Bromus madritensis,* and native species, such as *Artemisia dracunculus* and *Croton californicus.*

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 84-3422 ft, mean 1929 ft
Aspect: variable but more often SE or SW
Slope: somewhat steep, range 4-33 degrees, mean 20.0 degrees
Topography: more often flat, occasionally convex or undulating, lower to middle slope
Litter Cover: range 1.5-82%, mean 29.0%
Rock Cover: range 0.4-90%, mean 22.6%
Bare Ground: range 4.0-88%, mean 44.6%
Parent Material: Mesozoic granite or sandstone
Soil Texture: more often medium to very fine loamy sand, occasionally coarse loamy sand, medium loam, or fine sandy clay loam

The *Lotus scoparius* Alliance is found on the Coastal Terraces (261Bj), Western Granitic Foothills (M262Bn), and Desert Slopes (M262Bp) Subsections of the study area, particularly in areas that have been recently disturbed such as through clearing or fire (e.g. areas burned by the Pines Fire of 2002).

Samples used to describe alliance: (n=9) SDRP0192, SDRP0193, SDRP0231, SDRP0258, SFVW023, SFVW024, SFVW046, SFVW090, SFVW151,

RANK: G5 S5 (though associations may be locally rare)

GLOBAL DISTRIBUTION
Alliance and *Lotus scoparius* Assocation: Central Coast (including San Benito County), western Transverse Ranges (including Santa Monica Mountains), Sierra Nevada foothills (J. Evens personal observation), South Coast and Peninsular Ranges (including Ventura County south to W Riverside and San Diego Counties), Colorado Desert (including Anza-Borrego Desert)

REFERENCES
CDFG 1998, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Klein and Evens 2005, White 1994

***Lotus scoparius* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	LOSC2	*Lotus scoparius*	1	18.7	4	65
	ERFA2	*Eriogonum fasciculatum*	0.6	0.7	0.2	3
	ADFA	*Adenostoma fasciculatum*	0.4	1.0	0.2	8
	MADE	*Malacothamnus densiflorus*	0.4	1.0	0.2	8
	ARCA11	*Artemisia californica*	0.4	0.8	0.2	4
	RHOV	*Rhus ovata*	0.4	0.4	0.2	3
	SAAP2	*Salvia apiana*	0.3	0.3	0.2	2
	PRFR	*Prunus fremontii*	0.2	0.6	0.2	5
	HASQ2	*Hazardia squarrosa*	0.2	0.2	1	1
	OPLI3	*Opuntia littoralis*	0.2	0.1	0.2	1
Herbaceous						
	BRMA3	*Bromus madritensis*	0.9	8.4	2	42
	CEME2	*Centaurea melitensis*	0.4	0.8	1	3
	ARDR4	*Artemisia dracunculus*	0.3	2.0	0.2	10
	ERODI	*Erodium*	0.3	1.6	3	6
	CRCA5	*Croton californicus*	0.2	2.0	8	10
	BRASS2	*Brassica nigra*	0.2	1.7	2	13
	LOST4	*Lotus strigosus*	0.2	0.2	1	1
	CAMIS	*Camissonia*	0.2	0.0	0.2	0.2
	PACA2	*Paeonia californica*	0.2	0.0	0.2	0.2

***Malosma laurina* Alliance (Laurel Sumac)**

ASSOCIATIONS
Malosma laurina-Eriogonum fasciculatum
Malosma laurina-Eriogonum fasciculatum-Salvia mellifera

LOCAL VEGETATION DESCRIPTION
Stands of *Malosma laurina* Shrubland form a sparse to continuous shrub layer (6-73%, mean 33%), where *Malosma laurina* dominates or co-dominates with coastal sage species such as *Eriogonum fasciculatum* or *Salvia* spp. Shrubs usually occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is sparse to intermittent (0.2-65%, mean 27.7%) at 0-2m tall. Total vegetation cover is 37-80%, mean 56.2%.

In the *Malosma laurina-Eriogonum fasciculatum* Association, *Malosma laurina* and *Eriogonum fasciculatum* are usually co-dominant in the shrub layer. The understory herbaceous layer is variable and usually dominated by non-native species such as *Bromus madritensis, Avena fatua, Centaurea melitensis,* and *Hirschfeldia incana.*

In the *Malosma laurina-Eriogonum fasciculatum-Salvia mellifera* Association, *Malosma laurina, Salvia mellifera,* and *Eriogonum fasciculatum* usually co-dominate in the shrub layer. *Artemisia californica* may also be present. The herbaceous layer, which includes a variety of native and non-native species, is usually dominated by *Bromus madritensis*.

Ceanothus verrucosus, a CNPS List 2 species (CNPS 2005), was found in 1 of 11 surveys of the *Malosma laurina* Alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 265-1250 ft, mean 694 ft
Aspect: variable
Slope: moderate to steep, range 6-30 degrees, mean 21.3 degrees
Topography: often undulating, occasionally convex, concave or flat, lower to upper slope
Litter Cover: range 12-84%, mean 35.1%
Rock Cover: range 3-43%, mean 19.2%
Bare Ground: range 8-65%, mean 41.9%
Parent Material: usually Mesozoic granite, occasionally sandstone or Metavolcanic
Soil Texture: Often medium to very fine sandy loam, occasionally medium loam, moderately fine clay loam, moderately fine sandy clay loam, moderately fine silty clay loam

The *Malosma laurina* Alliance was sampled in the Coastal Hills (261Bi) and Western Granitic Foothills (M262Bn) Subsections from the Lake Hodges area east to the Pamo Valley area. It is particularly found in rocky areas within coastal sage scrub.

Samples used to describe alliance: (n=11) SDRP0131, SDRP0263, SDRP0329, SDRP0334, SDRP0359, SDRP0401, SDRP0421, SDRP0423, SDRP0427, SDRP0441, SDRP0477

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

GLOBAL DISTRIBUTION
Alliance: outer South Coast (coastal hills of Ventura County south to W Riverside and San Diego Counties), western Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (including W Riverside and San Diego Counties), Baja California

Malosma laurina-Eriogonum fasciculatum Association: South Coast and Transverse Ranges (including Ventura and Los Angeles Counties: Santa Monica Mountains), Peninsular Ranges (including W Riverside: Santa Ana Mountains; San Diego County: western foothills)
Malosma laurina-Eriogonum fasciculatum-Salvia mellifera Association: South Coast (including San Diego County: coastal hills), Peninsular Ranges (W Riverside County: Santa Ana Mountains)

REFERENCES
CNPS and CDFG 2005b, Klein and Evens 2005, Sawyer and Keeler-Wolf 1995

***Malosma laurina* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	MALA6	*Malosma laurina*	1	10.6	3	19
	ERFA2	*Eriogonum fasciculatum*	0.9	7.3	1	30
	SAME3	*Salvia mellifera*	0.6	10.7	0.2	47
	ARCA11	*Artemisia californica*	0.6	1.8	0.2	8
	XYBI	*Xylococcus bicolor*	0.3	2.1	1	20
	CNDU	*Cneoridium dumosum*	0.3	0.7	1	5
	ADFA	*Adenostoma fasciculatum*	0.3	0.6	0.2	3
	HEAR5	*Heteromeles arbutifolia*	0.3	0.2	0.2	2
Herbaceous						
	BRMA3	*Bromus madritensis*	0.7	6.4	3	20
	HIIN3	*Hirschfeldia incana*	0.5	6.9	2	50
	AVFA	*Avena fatua*	0.5	6	4	20
	CEME2	*Centaurea melitensis*	0.4	1.8	2	8
	BRDI3	*Bromus diandrus*	0.3	2.6	6	14
	SACO6	*Salvia columbariae*	0.3	1.1	1	9
	PHPA3	*Phacelia parryi*	0.3	0.2	0.2	2
Cryptogam						
	LICHEN	Lichen	0.3	1.1	3	5

***Mesembryanthemum* spp. - *Carpobrotus* spp. Alliance (Ice Plant - Sea Fig)**

ASSOCIATIONS
Carpobrotus chilensis-Artemisia californica

LOCAL VEGETATION DESCRIPTION
A stand of *Carpobrotus chilensis* forms an intermittent herbaceous layer (65%) at 0-0.5m tall, where *Carpobrotus chilensis* dominates. The shrub layer is open (30%) at 1-5m tall. Trees occur as emergents (2% cover) at 5-10m tall. Total vegetation cover is 90%.

In one stand of the *Carpobrotus chilensis-Artemisia californica* Association, *Carpobrotus chilensis* dominates in the shrub layer. *Artemisia californica* is sub-dominant at varying cover, partially depending on the amount of *Carpobrotus* invasion. Other shrub species at low cover include *Atriplex lentiformis* and *Baccharis pilularis*. The tree and herbaceous layers are spare, including *Salix lasiolepis* and *Cortaderia jubata,* respectively.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 16 ft
Aspect: NE
Slope: moderate, 10 degrees
Topography: undulating, bottom to lower slope
Litter Cover: 90.3%
Rock Cover: 0.4%
Bare Ground: 4%
Parent Material: sandstone
Soil Texture: medium to very fine loamy sand

The *Mesembryanthemum* spp. - *Carpobrotus* spp. Alliance was sampled only within the Coastal Terraces (261Bj) Subsection within the wildland-urban interface of development and coastal sage scrub where ornamental species have escaped from cultivation.

Samples used to describe alliance: (n=1) SDRP0341

RANK: none, invasive

GLOBAL DISTRIBUTION
Alliance: outer North to outer South Coast to Mexico; native to southern Africa

Carpobrotus chilensis-Artemisia californica Association: South Coast (including San Diego County: coastal terraces). Full distribution is not known but potentially includes Central Coast, California

REFERENCES
CNPS and CDFG 2005b, Sawyer and Keeler-Wolf 1995

***Mesembryanthemum* spp. - *Carpobrotus chilensis* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Understory						
	SALA6-t	*Salix lasiolepis*	1	0.2	0.2	0.2
Shrub						
	CACH38	*Carpobrotus chilensis*	1	65	65	65
	ARCA11	*Artemisia californica*	1	18	18	18
	ATLE	*Atriplex lentiformis*	1	9	9	9
	BAPI	*Baccharis pilularis*	1	4	4	4
	ENFA	*Encelia farinosa*	1	1	1	1
	RHIN2	*Rhus integrifolia*	1	1	1	1
	SALA6-m	*Salix lasiolepis*	1	1	1	1
	ISME5	*Isocoma menziesii*	1	1	1	1
	ACLO	*Acacia longifolia*	1	1	1	1
	ENCA	*Encelia californica*	1	1	1	1
Herbaceous						
	COJU2	*Cortaderia jubata*	1	1	1	1

***Opuntia littoralis* Alliance (Coast Prickly-pear)**

ASSOCIATIONS
Opuntia littoralis-Eriogonum fasciculatum-Malosma laurina
Opuntia-Mixed Coastal Sage Scrub

LOCAL VEGETATION DESCRIPTION
Stands of *Opuntia littoralis* Shrubland form an open to intermittent shrub layer (30-42%, mean 36%) at 0-2m tall, where *Opuntia littoralis* dominates or co-dominates, usually with coastal sage scrub species. The herbaceous layer is sparse (0.2-8%, mean 2.8%) at 0-1m tall. Total vegetation cover is 30-48%, mean 39.3%.

In the *Opuntia littoralis-Eriogonum fasciculatum-Malosma laurina* Association, *Opuntia littoralis* and *Eriogonum fasciculatum* are co-dominant, while *Malosma laurina* is present in varying cover.

In reconnaissance surveys, *Opuntia littoralis* was found co-dominating with *Artemisia californica* and/or *Eriogonum fasciculatum*, which may be considered an *Opuntia*-Mixed coastal sage scrub Association.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 292-871 ft, mean 518 ft
Aspect: SW
Slope: moderate to somewhat steep, range 13-22 degrees, mean 16.7 degrees
Topography: undulating, lower to upper slope
Litter Cover: range 24.7-38%, mean 31.2%
Rock Cover: range 13-20%, mean 16.5%
Bare Ground: range 44-50%, mean 47%
Parent Material: Mesozoic granite
Soil Texture: moderately fine clay loam (from one plot)

The *Opuntia littoralis* Alliance was sampled in the Coastal Hills (261Bi) and Western Granitic Foothills (M262Bn) Subsections from the Lake Hodges area east towards Boden and Pamo Canyons.

Samples used to describe alliance: (n=3) SDRP0137, SDRP0246, SDRP0324

RANK: G1 S1, G2 S1, and G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: outer South Coast (including coastal hills and terraces of Ventura County south to W Riverside and San Diego Counties), western Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (including western foothills of San Diego County), Channel Islands, Baja California

Opuntia littoralis-Eriogonum fasciculatum-Malosma laurina Association: South Coast and Southern Peninsular Ranges (coastal hills and western foothills of San Diego County), though full distribution is not known
Opuntia-Mixed Coastal Sage Scrub Association: coastal hills of the South Coast (including Ventura, Los Angeles, and San Diego Counties), western Transverse Ranges (including Santa Monica Mountains)

REFERENCES
CNPS and CDFG 2005b, Klein and Evens 2005, Sawyer and Keeler-Wolf 1995

***Opuntia littoralis* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	ERFA2	*Eriogonum fasciculatum*	1	15	12	21
	OPLI3	*Opuntia littoralis*	1	13.3	10	15
	MALA6	*Malosma laurina*	1	3.7	1	8
	ARCA11	*Artemisia californica*	0.3	5.7	17	17
Herbaceous						
	BRMA3	*Bromus madritensis*	0.3	0.3	1	1
	CUSCU	*Cuscuta*	0.3	0.3	1	1
Cryptogam						
	LICHEN	Lichen	0.3	0.3	1	1

***Prosopis glandulosa* Alliance (Honey Mesquite)**

ASSOCIATIONS
*Prosopis glandulosa-Rhus ovata (*Upper Desert Mesquite Spring) Association

LOCAL VEGETATION DESCRIPTION
Stands of *Prosopis glandulosa* Shrubland form an open to intermittent shrub layer (2-55%, mean 21%), where *Prosopis glandulosa* dominates. Shrubs occasionally occur in two different strata, with low shrubs at 0.5-1m tall and tall shrubs at 0-10m tall. The herbaceous layer is sparse to intermittent (1-65%, mean 25.5%) at 0-1m tall. Trees of *Prosopis glandulosa* occasionally occur as emergents (one survey at 15%) at 5-10m tall. Total vegetation cover is 15-95%, mean 60.5%.

In this Alliance, *Prosopis glandulosa* is dominant among a variety of other woody shrubs and cacti. The herbaceous layer is comprised of a variety of native and non-native species (see species table), and it may be dominated by *Bromus diandrus.*

In the *Prosopis glandulosa-Rhus ovata (*Upper Desert Mesquite Spring) Association, *Prosopis glandulosa* is relatively high in cover though a variety of upland and riparian shrub species also occur in lower cover, such as *Rhus ovata, Acacia greggii, Juniperus californica, Sambucus racemosa,* and *Yucca schidigera.*

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 2444-2918 ft, mean 2644 ft
Aspect: more often SW or SE, occasionally flat or NE
Slope: flat to gentle, range 0-6 degrees, mean 2.9 degrees
Topography: more often flat, occasionally convex or undulating, bottom to lower slope
Litter Cover: range 1-40%, mean 10.3%
Rock Cover: range 4-90%, mean 48.5%
Bare Ground: range 1-91%, mean 19.1%
Parent Material: alluvium and other deposits
Soil Texture: more often medium to very fine sandy loam or coarse to fine loamy sand, occasionally medium sand, fine sandy clay, or medium silt loam

The *Prosopis glandulosa* Alliance occurs along intermittently flooded margins of arroyos and washes, streambanks and floodplains, fringes of playa lakes, sand dunes, springs, and surrounding alkali sinks. In the study area it occurred in the Desert Slopes (M262Bp) Subsection, particularly on the desert slope floodplains and washes of San Felipe Valley.

Samples used to describe alliance: (n=13) SDRP0102, SDRP0103, SDRP0118, SDRP0123, SFVW026, SFVW035, SFVW036, SFVW080, SFVW100, SFVW101, SFVW102, SFVW104, SFVW116

RANK: G3 S2 and G4 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: South Coast (including W Riverside: Perris Valley and hills and Fontana Plain - Calimesa Terraces), 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-Rhus ovata (*Upper Desert Mesquite Spring) Association: Sonoran Desert (including San Diego County: San Felipe Valley and Anza Borrego Desert), though full distribution is not known

REFERENCES
CDFG 1998, Keeler-Wolf et al. 2004, Klein and Evens 2005, NatureServe 2004, Spolsky 1979,

Thomas et al. 2004

***Prosopis glandulosa* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	PRGL2	*Prosopis glandulosa*	1	16.5	2	35
	JUCA7	*Juniperus californica*	0.2	1.7	1	19
	ACGR	*Acacia greggii*	0.2	0.6	0.2	5
	YUSC2	*Yucca schidigera*	0.2	0.3	0.2	3
	SAME5	*Sambucus mexicana*	0.2	0.2	0.2	2
	ISAC2	*Isocoma acradenia*	0.2	0.0	0.2	0.2
Herbaceous						
	BRMA3	*Bromus madritensis*	0.9	14.3	0.2	30
	ERCI6	*Erodium cicutarium*	0.7	11.0	0.2	45
	PLAR	*Plagiobothrys arizonicus*	0.5	0.2	0.2	1
	BRDI3	*Bromus diandrus*	0.4	6.8	0.2	65
	LUBI	*Lupinus bicolor*	0.4	0.3	0.2	2
	SCHIS	*Schismus*	0.3	1.5	2	11
	SISYM	*Sisymbrium*	0.3	0.6	0.2	5
	HIIN3	*Hirschfeldia incana*	0.2	0.4	0.2	5
	DESO2	*Descurainia sophia*	0.2	0.3	1	2
	HOMU	*Hordeum murinum*	0.2	0.2	0.2	2
	AMMEI2	*Amsinckia menziesii* var. *intermedia*	0.2	0.0	0.2	0.2
Epiphyte						
	PHCA8	*Phoradendron californicum*	0.2	0.2	0.2	1

***Prunus fremontii* Alliance (Desert Apricot)**

ASSOCIATIONS
Prunus fremontii

LOCAL VEGETATION DESCRIPTION
One sample of *Prunus fremontii* Shrubland forms an open shrub layer (5-31%, mean 18.3%), where *Prunus fremontii* dominates. Shrubs are in two different strata, with low shrubs at 0.5-1m tall and tall shrubs at 1-5m tall. The herbaceous layer is open (15-33%, mean 22.8%) at 0-0.5m tall. Total vegetation cover is open to intermittent at 22-60%, mean 36.3%.

In this alliance, *Prunus fremontii* is dominant in the shrub layer. *Eriogonum fasciculatum, Acacia greggii,* and *Yucca whipplei* are also characteristically present in lower cover, while *Rhus* ovata, *Lotus scoparius,* and *Opuntia acanthocarpa* are often present in low cover. The herbaceous layer consistently has non-native species such as *Bromus madritensis, Erodium cicutarium,* and *Avena barbata,* though native species such as *Lupinus concinnus, Marah macrocarpus Mirabilis* sp., and *Salvia columbariae* also may occur.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 2492-2801 ft, mean 2643.3 ft
Aspect: often SE or NE, sometimes NW or Flat/none
Slope: flat to somewhat steep, range 0-17 degrees, mean 9.0 degrees
Topography: frequently undulating, sometime flat or convex; lower to middle slope
Litter Cover: range 0-40%, mean 12.6%
Rock Cover: range 4-54%, mean 25.2%
Bare Ground: range 35-94%, mean 52.8%
Parent Material: sandy alluvium and other deposits
Soil Texture: medium to fine sand, coarse to very fine loamy sand

The *Prunus fremontii* Alliance was sampled only within the Desert Slopes (M262Bp) Subsection on repeating small, alluvial hillslopes in desert transition above San Felipe Valley.

Samples used to describe alliance: (n=6) SDRP0104, SFVW004, SFVW014, SFVW031, SFVW081, SFVW118

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance and *Prunus fremontii* Association: Desert slopes of San Diego County (including San Felipe Valley and Anza-Borrego Desert regions)

REFERENCES
CDFG 1998

***Prunus fremontii* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	PRFR	*Prunus fremontii*	1	7.2	0.2	18
	ERFA2	*Eriogonum fasciculatum*	1	1.8	0.2	6
	ACGR	*Acacia greggii*	0.8	0.6	0.2	2
	YUWH	*Yucca whipplei*	0.8	0.4	0.2	1
	RHOV	*Rhus ovata*	0.5	2.2	1	8
	LOSC2	*Lotus scoparius*	0.5	0.2	0.2	1
	OPAC	*Opuntia acanthocarpa*	0.5	0.2	0.2	1
	ADFA	*Adenostoma fasciculatum*	0.3	1.2	1	6
	GUSA2	*Gutierrezia sarothrae*	0.3	0.4	0.2	2
Herbaceous						
	BRMA3	*Bromus madritensis*	1	14.5	6	30
	ERCI6	*Erodium cicutarium*	1	4.5	0.2	7
	LUCO	*Lupinus concinnus*	0.3	1.8	2	9
	AVBA	*Avena barbata*	0.3	0.7	0.2	4
	MAMA8	*Marah macrocarpus*	0.3	0.2	0.2	1
	CAMIS	*Camissonia*	0.3	0.1	0.2	0.2
	SACO6	*Salvia columbariae*	0.3	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 (26-40%, mean 33%) at 0.5-2m tall, where *Prunus ilicifolia* dominates or co-dominates. The herbaceous layer is sparse (0.2-5%, mean 2.6%) at 0-0.5m tall. Total vegetation cover is 26-45%, mean 35.5%.

In the *Prunus ilicifolia-Heteromeles arbutifolia* Association, *Heteromeles arbutifolia* is found as a subdominant to co-dominant with *Prunus ilicifolia*. A variety of other shrubs and herbs also usually occur in the association (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 1638-2745 ft, mean 2192 ft
Aspect: NW or SE
Slope: steep, range 30-34 degrees, mean 32.0 degrees
Topography: undulating, lower slope
Litter Cover: 22.5%, mean 22.5% (for one plot)
Rock Cover: 72%, mean 72% (for one plot)
Bare Ground: 0.2%, mean 0.2% (for one plot)
Parent Material: mixed granitic and metamorphic or gabbro or diorite or Mesozoic granite
Soil Texture: medium to very fine sandy loam (for one plot)

The *Prunus ilicifolia* Alliance was sampled only within the Western Granitic Foothills (M262Bn) Subsection on rocky, undulating granitic slopes just above dry creekbeds.

Samples used to describe alliance: (n=2) SDRP0063, SDRP0290

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

GLOBAL DISTRIBUTION
Alliance: outer central and south Coast (includes Marin County south to Santa Barbara, Ventura, Los Angeles, and W Riverside Counties), Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (including W 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, Los Angeles, and W Riverside Counties), western Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (including W Riverside County: San Jacinto foothills, San Diego County: western foothills)

REFERENCES
Borchert et al. 2004, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San 2004, Klein and Evens 2005, NatureServe et al. 2003a, Sawyer and Keeler-Wolf 1995

***Prunus ilicifolia* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	QUAG-t	*Quercus agrifolia*	0.5	0.1	0.2	0.2
Shrub						
	PRIL	*Prunus ilicifolia*	1	24.5	19	30
	HEAR5	*Heteromeles arbutifolia*	1	6.5	3	10
	RHIL	*Rhamnus ilicifolia*	1	1.1	0.2	2
	ARCA11	*Artemisia californica*	1	1.1	0.2	2
	MIAU	*Mimulus aurantiacus*	1	0.2	0.2	0.2
	BRCA3	*Brickellia californica*	1	0.2	0.2	0.2
	ARPR	*Arctostaphylos (pringlei)*	0.5	1.5	3	3
	TODI	*Toxicodendron diversilobum*	0.5	0.5	1	1
	KETE	*Keckiella ternata*	0.5	0.5	1	1
	OPUNT	*Opuntia (littoralis x phaeacantha)*	0.5	0.1	0.2	0.2
	LOSU2	*Lonicera subspicata*	0.5	0.1	0.2	0.2
	RIBES	*Ribes*	0.5	0.1	0.2	0.2
Herbaceous						
	BRDI3	*Bromus diandrus*	1	0.2	0.2	0.2
	BRMA3	*Bromus madritensis*	0.5	0.1	0.2	0.2
	CLEMA	*Clematis (lasiantha)*	0.5	0.1	0.2	0.2
Cryptogam						
	LICHEN	Lichen	0.5	15	30	30
	MOSS	Moss	0.5	2	4	4

***Prunus virginiana* Alliance (Western Chokecherry)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
A stand of *Prunus virginiana* Shrubland forms an intermittent shrub layer (66%), where *Prunus virginiana* dominates. The herbaceous layer is open (30%). Trees occur as emergents (1%). Total vegetation cover is 66%.

In one sample of the *Prunus virginiana* Alliance, *Prunus virginiana* dominates. *Symphoricarpos mollis, Rosa californica,* and a variety of other shrubs are also present but in lower cover. The herbaceous layer is diverse with native and non-native species (see species table).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, 4222 ft
Aspect: NW
Slope: steep, range 42 degrees
Topography: flat, lower slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed granitic and metamorphic
Soil Texture: no data

The *Prunus virginiana* Alliance was sampled only within the Palomar - Cuyamaca Peak (M262Bo) Subsection in large patches on middle to upper slopes of Volcan Mountain. It is associated with rock outcrops and draws.

Samples used to describe alliance: (n=1) SDRP0221

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: widely distributed in scattered locations in the western United States; confirmed from California, Oregon, Washington, Colorado, Idaho, Montana, Wyoming, and South Dakota

REFERENCES
Manning and Padgett 1995, NatureServe 2004, Sproul 2001

***Prunus virginiana* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Understory						
	QUAG-m	*Quercus agrifolia*	1	1	1	1
Shrub						
	PRVI	*Prunus virginiana*	1	45	45	45
	SYMO	*Symphoricarpos mollis*	1	10	10	10
	ROCA2	*Rosa californica*	1	8	8	8
	SAME5	*Sambucus mexicana*	1	4	4	4
	RHCA	*Rhamnus californica*	1	3	3	3
	TODI	*Toxicodendron diversilobum*	1	3	3	3
	RHTR	*Rhus trilobata*	1	0.2	0.2	0.2
	ERFA2	*Eriogonum fasciculatum*	1	0.2	0.2	0.2
Herbaceous						
	BRDI3	*Bromus diandrus*	1	20	20	20
	BRHO2	*Bromus hordeaceus*	1	10	10	10
	LOPU3	*Lotus purshianus*	1	5	5	5
	BRTE	*Bromus tectorum*	1	2	2	2
	LASE	*Lactuca serriola*	1	1	1	1
	HIIN3	*Hirschfeldia incana*	1	1	1	1
	MAVU	*Marrubium vulgare*	1	0.2	0.2	0.2
	AVBA	*Avena barbata*	1	0.2	0.2	0.2
	URDI	*Urtica dioica*	1	0.2	0.2	0.2
	CRIN8	*Cryptantha intermedia*	1	0.2	0.2	0.2
	SCCA2	*Scrophularia californica*	1	0.2	0.2	0.2

***Quercus berberidifolia* Alliance (Scrub Oak)**

ASSOCIATIONS
Quercus berberidifolia
Quercus berberidifolia-Adenostoma fasciculatum-Arctostaphylos glandulosa

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus berberidifolia* Shrubland form an intermittent to continuous shrub layer (40-95%, mean 62.6%), where *Quercus berberidifolia* 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, when present, is usually open (0-35%, mean 9.9%) at 0-0.5m tall. Trees occasionally occur as emergents (1-4% cover, mean 1.8%) at 2-10m tall. Total vegetation cover is 52-95%, mean 72.6%.

In the *Quercus berberidifolia* Association, *Q. berberidifolia* is the sole dominant in the shrub layer. The understory herbaceous layer is sparse or may be dominated by non-native species such as *Bromus diandrus* or *B. madritensis*.

In the *Quercus berberidifolia-Adenostoma fasciculatum-Arctostaphylos glandulosa* Association, *Q. berberidifolia* is dominant, and *Adenostoma fasciculatum* and *Arctostaphylos glandulosa* are sub-dominant (though sometimes *A. glandulosa* may be co-dominant). *Salvia apiana* is often present in low cover. Other shrubs or trees such as *Quercus* × *grandidentata* or *Q. engelmannii* may be found.

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 3 of the 9 surveys of the *Quercus berberidifolia* Alliance at low cover values. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2404-3999 ft, mean 2714 ft
Aspect: NE or NW
Slope: somewhat steep to steep, range 15-30 degrees, mean 23.3 degrees
Topography: concave or undulating, occasionally convex, lower to upper slope
Litter Cover: range 66-91%, mean 79.7%
Rock Cover: range 1.2-3%, mean 2.1%
Bare Ground: range 3-25%, mean 12.7%
Parent Material: Mesozoic granite or mixed granitic and metamorphic, occasionally metamorphic
Soil Texture: more often medium to very fine sandy loam, occasionally coarse loamy sand, moderately coarse sandy loam, or moderately fine sandy clay loam

The *Quercus berberidifolia* Alliance was sampled in the Western Granitic Foothills (M262Bn) and Palomar - Cuyamaca Peak (M262Bo) Subsections on northerly steep slopes.

Samples used to describe alliance: (n=9) SDRP0021, SDRP0038, SDRP0155, SDRP0171, SDRP0173, SDRP0179, SDRP0197, SDRP0302, SFVW154

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

GLOBAL DISTRIBUTION
Alliance: inner North Coast, Cascade Range foothills, Sierra Nevada foothills, Central Coast (including San Benito, Monterey, and San Luis Obispo Counties), western Transverse to southern Peninsular Ranges (including Ventura County south to W Riverside and San Diego Counties), Anza-Borrego Desert, Baja California

Quercus berberidifolia Association: montane Central Coast (including Monterey and San Luis Obispo

Counties), western Transverse to southern Peninsular Ranges (including Ventura County south to W Riverside and San Diego Counties), though full distribution is not known
Quercus berberidifolia-Adenostoma fasciculatum-Arctostaphylos glandulosa Association: Peninsular Ranges (W Riverside County: Santa Ana Mountains, San Diego: western foothills and Palomar - Cuyamaca Peak area), though full distribution is not known

REFERENCES

Allen et al. 1989, Allen et al. 1991, Borchert et al. 2004, CDFG 1998, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Gordon and White 1994, Hanes 1976, Klein and Evens 2005, Sawyer and Keeler-Wolf 1995

***Quercus berberidifolia* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	QUAG-t	*Quercus agrifolia*	0.3	0.3	1	1
	QUEN-t	*Quercus engelmannii*	0.2	0.8	3	4
Shrub						
	QUBE5	*Quercus berberidifolia*	1	37.1	5	65
	SAAP2	*Salvia apiana*	0.8	2.5	0.2	8
	ARGL3	*Arctostaphylos glandulosa*	0.6	6.9	0.2	55
	ADFA	*Adenostoma fasciculatum*	0.6	3.0	1	12
	ERFA2	*Eriogonum fasciculatum*	0.6	0.6	0.2	5
	LOSU2	*Lonicera subspicata*	0.6	0.3	0.2	1
	TODI	*Toxicodendron diversilobum*	0.4	1.3	1	7
	MIAU	*Mimulus aurantiacus*	0.3	0.5	0.2	3
	RHIL	*Rhamnus ilicifolia*	0.3	0.5	0.2	3
	HEAR5	*Heteromeles arbutifolia*	0.3	0.4	1	2
	HASQ2	*Hazardia squarrosa*	0.3	0.2	0.2	1
	RHCR	*Rhamnus crocea*	0.2	1.3	2	10
	ARCA11	*Artemisia californica*	0.2	1.1	2	8
	MALA6	*Malosma laurina*	0.2	0.4	0.2	3
	CEBE3	*Cercocarpus betuloides*	0.2	0.2	0.2	2
	RHOV	*Rhus ovata*	0.2	0.2	1	1
Herbaceous						
	BRMA3	*Bromus madritensis*	0.6	3.5	0.2	28
	BRDI3	*Bromus diandrus*	0.4	2.3	0.2	20
	MAMA8	*Marah macrocarpus*	0.4	0.1	0.2	0.2
	BRHO2	*Bromus hordeaceus*	0.3	0.9	0.2	6
	PACA2	*Paeonia californica*	0.2	0.0	0.2	0.2

***Quercus berberidifolia-Adenostoma fasciculatum* Alliance (Scrub Oak - Chamise)**

ASSOCIATIONS
Quercus berberidifolia-Adenostoma fasciculatum

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus berberidifolia-Adenostoma fasciculatum* Shrubland form an intermittent to continuous shrub layer (45-70%, mean 58.8%), where *Quercus berberidifolia* and *Adenostoma fasciculatum* co-dominate. Shrubs often occur in two different strata, with low shrubs at 1-2m tall and tall shrubs at 1-5m tall. The herbaceous layer, when present, is sparse to intermittent (0-50%, mean 16.3%) at 0-0.5m tall. Trees infrequently occur as emergents (3% cover, mean 3%) at 10-15m tall. Total vegetation cover is 45-80%, mean 66.3%.

In the *Quercus berberidifolia-Adenostoma fasciculatum* Association, *Quercus berberidifolia* and *Adenostoma fasciculatum* usually are co-dominant. Other shrubs may be present but with relatively low cover. The herbaceous layer is usually sparse but can be dominated by non-native species *Bromus diandrus* and *B. madritensis,* or by native species *Pterostegia drymarioides*.

Quercus engelmannii, a CNPS List 4 species (CNPS 2005), was found in 3 of 4 surveys of the *Quercus berberidifolia-Adenostoma fasciculatu*m Alliance at low cover values. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2386-3075 ft, mean 2705 ft
Aspect: NE, NW, or SE
Slope: moderate to steep, range 14-30 degrees, mean 21.5 degrees
Topography: more often undulating, occasionally convex or concave, lower to upper slope
Litter Cover: range 45-65%, mean 58.3%
Rock Cover: range 5.2-23%, mean 14.1%
Bare Ground: range 12-35%, mean 24%
Parent Material: Mesozoic granite or mixed granitic and metamorphic
Soil Texture: more often moderately fine clay loam, occasionally medium loam

The *Quercus berberidifolia-Adenostoma fasciculatum* Alliance was sampled in the Western Granitic Foothills (M262Bn) and Palomar - Cuyamaca Peak (M262Bo) Subsections on northerly or neutral slopes that are moderately steep to steep.

Samples used to describe alliance: (n=4) SDRP0108, SDRP0349, SDRP0446, SDRP0498

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: South Coast (including W Riverside County), 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 (including W Riverside County: Santa Ana Mountains, San Jacinto Mountains and Foothills; San Diego County: western foothills and Palomar - Cuyamaca Peak region), though full distribution is not known

REFERENCES
Borchert et al. 2004, CNPS and CDFG 2005b, Gordon and White 1994, Klein and Evens 2005, Sawyer

and Keeler-Wolf 1995, Vogl 1976

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

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	QUAG-t	*Quercus agrifolia*	0.3	0.8	3	3
	QUEN-t	*Quercus engelmannii*	0.3	0.3	1	1
Tree Understory						
	QUEN-m	*Quercus engelmannii*	0.5	0.3	0.2	1
Shrub						
	ADFA	*Adenostoma fasciculatum*	1	28.5	18	38
	QUBE5	*Quercus berberidifolia*	1	20	14	30
	ERFA2	*Eriogonum fasciculatum*	0.8	0.8	0.2	2
	SAAP2	*Salvia apiana*	0.5	2.1	0.2	8
	CELE2	*Ceanothus leucodermis*	0.5	1.3	1	4
	ARCA11	*Artemisia californica*	0.5	1.1	0.2	4
	LOSU2	*Lonicera subspicata*	0.5	0.5	1	1
	CEGR	*Ceanothus greggii*	0.5	0.3	0.2	1
	MIAU	*Mimulus aurantiacus*	0.5	0.3	0.2	1
	GUCA	*Gutierrezia californica*	0.3	1.8	7	7
	SACL	*Salvia clevelandii*	0.3	1.3	5	5
	SAME3	*Salvia mellifera*	0.3	1.3	5	5
	ARGL4	*Arctostaphylos glauca*	0.3	1	4	4
	RHOV	*Rhus ovata*	0.3	0.8	3	3
	TODI	*Toxicodendron diversilobum*	0.3	0.3	1	1
Herbaceous						
	BRMA3	*Bromus madritensis*	0.8	4.6	0.2	10
	BRDI3	*Bromus diandrus*	0.8	2.3	0.2	5
	MAMA8	*Marah macrocarpus*	0.8	0.8	0.2	2
	FIGA	*Filago gallica*	0.5	2	4	4
	PTDR	*Pterostegia drymarioides*	0.3	5	20	20
	STGN	*Stylocline gnaphalioides*	0.3	0.3	1	1
	BRHO2	*Bromus hordeaceus*	0.3	0.3	1	1
	NAPU4	*Nassella pulchra*	0.3	0.3	1	1

***Quercus cornelius-mulleri* Alliance (Muller Oak)**

ASSOCIATIONS

Quercus cornelius-mulleri-Eriogonum fasciculatum-Ericameria linearifolia
Quercus cornelius-mulleri-Rhus ovata

LOCAL VEGETATION DESCRIPTION

Stands of *Quercus cornelius-mulleri* Shrubland form an open to intermittent shrub layer (4.0-47%, mean 15.6%). *Quercus cornelius-mulleri* is characteristically present as an indicator species that dominates or co-dominates with other shrubs in desert-transition environments. Shrubs often occur in two different strata, with low shrubs at 0-2m tall and tall shrubs at 1-10m tall. The herbaceous layer is open to intermittent (7.0-40%, mean 21.9%) at 0-1m tall. Trees occur occasionally as emergents (0.2-3% cover, mean 1.6%) at 5-10m tall. Total vegetation cover is 23.0-56%, mean 34.7%.

In the *Quercus cornelius-mulleri-Eriogonum fasciculatum-Ericameria linearifolia* Association, *Quercus cornelius-mulleri* is dominant to co-dominant over a mixture of low desert shrub species such as *Eriogonum fasciculatum, Ericameria linearifolia,* and *Gutierrezia sarothrae.* No other evergreen shrub exceeds the *Quercus* in cover although others (e.g., *Juniperus californica, Rhus ovata*, *Ceanothus greggii*) in total, may equal it in cover. Various desert succulent species also usually occur (e.g., *Echinocereus engelmannii, Opuntia acanthocarpa, O. chlorotica,* or *Agave deserti).* Herbaceous species may be present at variable cover, including *Bromus madritensis*, *Cryptantha,* and *Selaginella*.

In the *Quercus cornelius-mulleri-Rhus ovata* Association, *Quercus cornelius-mulleri* usually is co-dominant with *Rhus ovata* with an open understory. Other shrub species may also occur as sub-dominants such as *Arctostaphylos glauca, Adenostoma fasciculatum, Juniperus californica, Opuntia* spp., and *Eriogonum fasciculatum.* Herbaceous species may be present at low cover, including *Bromus madritensis*.

LOCAL ENVIRONMENTAL DESCRIPTION

Elevation: low, range 2622-3223 ft, mean 2769 ft
Aspect: usually NE or NW
Slope: gentle to steep, range 4-37 degrees, mean 18.8 degrees
Topography: concave, convex, or undulating; lower to middle slope
Litter Cover: range 1-5%, mean 2.1%
Rock Cover: range 2-57%, mean 18.5%
Bare Ground: range 41-95%, mean 84.0%
Parent Material: mixed granitic and metamorphic
Soil Texture: medium loam, coarse loamy sand or sandy loam, fine sand

The *Quercus cornelius-mulleri* Alliance was sampled on gentle to steep, north-trending slopes of the Palomar - Cuyamaca Peak (M262Bo) and Desert Slopes (M262Bp) Subsections along the lower, eastern side of Volcan Mountain and east to Anza Borrego State Park.

Samples used to describe alliance: (n=7) SFVW039, SFVW044, SFVW055, SFVW059, SFVW071, SFVW073, SFVW096

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

GLOBAL DISTRIBUTION

Alliance: eastern Peninsular Ranges (Western Riverside and San Diego Counties), Anza-Borrego Desert

Quercus cornelius-mulleri -Eriogonum fasciculatum-Ericameria linearifolia and *Quercus cornelius-mulleri-Rhus ovata* Associations: eastern Peninsular Range to the Anza Borrego Desert in San Diego County

REFERENCES
CDFG 1998, Klein and Evens 2005

***Quercus cornelius-mulleri* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	QUCO7	*Quercus cornelius-mulleri*	1	9.1	4	20
	RHOV	*Rhus ovata*	1	1.4	0.2	5
	ADFA	*Adenostoma fasciculatum*	1	1.4	0.2	3
	JUCA7	*Juniperus californica*	0.4	1.4	2	5
	MADE	*Malacothamnus densiflorus*	0.4	0.6	0.2	3
	CEGR	*Ceanothus greggii*	0.4	0.2	0.2	1
	ERCO25	*Eriophyllum confertiflorum*	0.4	0.2	0.2	1
	ARGL4	*Arctostaphylos glauca*	0.3	0.6	1	3
	ZIPA	*Ziziphus parryi*	0.3	0.6	2	2
	OPAC	*Opuntia acanthocarpa*	0.3	0.5	0.2	3
	SAAP2	*Salvia apiana*	0.3	0.3	1	1
	ERFA2	*Eriogonum fasciculatum*	0.3	0.2	0.2	1
	YUWH	*Yucca whipplei*	0.3	0.2	0.2	1
	ERTR7	*Eriodictyon trichocalyx*	0.3	0.1	0.2	0.2
Herbaceous						
	BRMA3	*Bromus madritensis*	0.9	10.0	0.2	28
	ERCI6	*Erodium cicutarium*	0.6	1.9	0.2	12
	SCHIS	*Schismus*	0.6	0.5	0.2	2
	MAMA8	*Marah macrocarpus*	0.6	0.1	0.2	0.2
	CLEX2	*Claytonia exigua*	0.4	1.2	0.2	6
	CRYPT	*Cryptantha*	0.3	0.6	2	2
	AGDE	*Agave deserti*	0.3	0.2	0.2	1
	SCCA2	*Scrophularia californica*	0.3	0.1	0.2	0.2
	SOLAN	*Solanum*	0.3	0.1	0.2	0.2

***Quercus wislizenii-Ceanothus leucodermis* Alliance (Interior Live Oak - Chaparral Whitethorn)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Quercus wislizenii-Ceanothus leucodermis* Shrubland form an open shrub layer (10-20%, mean 15.0%), where *Quercus wislizenii* and *Ceanothus leucodermis* usually co-dominate. Shrubs occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-2m tall. The herbaceous layer is open (6.0-12%, mean 9.0%) at 0-0.5m tall. Trees occur as sparse emergents (1-1% cover, mean 1.0%) at 5-10m tall. Total vegetation cover is 16-29%, mean 22.5%.

In three stands of this alliance, the shrub layer is diverse in nature due to recent fire disturbance. *Quercus wislizeni* and *Ceanothus leucodermis* may share dominance with *Arctostaphylos glandulosa, Eriophyllum confertiflorum, Rhamnus tomentella, Ribes roezlii, Quercus berberidifolia,* and *Q. chrysolepis.* A variety of fire-following and common herbs may also be present, including *Bromus tectorum, Cryptantha, Lotus strigosus, Helianthus gracilentus,* and *Penstemon spectabilis.*

Hulsea californica, a CNPS List 1B species, was found in 1 of the 3 surveys of the *Quercus wislizenii-Ceanothus leucodermis* Alliance, in the mid montane zone of Volcan Mountain. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 3414-5086 ft, mean 4497 ft
Aspect: NE, NW
Slope: somewhat steep, range 16-22 degrees, mean 19.0 degrees
Topography: flat, concave, undulating; middle to upper slope
Litter Cover: range 1-4%, mean 2.5%
Rock Cover: range 2-2%, mean 2.1%
Bare Ground: range 95-95%, mean 95.0%
Parent Material: mixed granitic and metamorphic or gabbro
Soil Texture: medium to very fine sandy loam

The *Quercus wislizenii-Ceanothus leucodermis* Alliance was sampled on somewhat steep, north-trending slopes only within the Palomar - Cuyamaca Peak (M262Bo) Subsection on middle to upper slopes of Volcan Mountain. Stands are regenerating after recent fire (e.g., on Volcan Mountain after the Pines Fire of 2002), and there is evidence of previous overstory tree presence (including tree *Quercus wislizeni)*.

Samples used to describe alliance: (n=3) SFVW138, SFVW140, SFVW155

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: montane Transverse and Peninsular Ranges (including San Bernardino, San Jacinto, Santa Ana, and Volcan Mountains)

REFERENCES
Gordon and White 1994, Sawyer and Keeler-Wolf 1995, White and Sawyer 1995

***Quercus wislizenii-Ceanothus leucodermis* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Understory						
	QUCH2-m	*Quercus chrysolepis*	0.3	0.7	2	2
Shrub						
	QUWIF	*Quercus wislizeni* var. *frutescens*	1	6.3	3	11
	CELE2	*Ceanothus leucodermis*	1	2.3	2	3
	ARGL3	*Arctostaphylos glandulosa*	0.7	1.1	0.2	3
	ERPA24	*Ericameria parishii*	0.7	0.1	0.2	0.2
	PESP3	*Penstemon spectabilis*	0.3	1.7	5	5
	RIRO	*Ribes roezlii*	0.3	1.7	5	5
	RHTO6	*Rhamnus tomentella*	0.3	1.0	3	3
	ERCO25	*Eriophyllum confertiflorum*	0.3	0.7	2	2
	QUBE5	*Quercus berberidifolia*	0.3	0.7	2	2
	RHCR	*Rhamnus crocea*	0.3	0.3	1	1
	RHOV	*Rhus ovata*	0.3	0.3	1	1
	CEBE3	*Cercocarpus betuloides*	0.3	0.1	0.2	0.2
	DERI	*Dendromecon rigida*	0.3	0.1	0.2	0.2
	HASQ2	*Hazardia squarrosa*	0.3	0.1	0.2	0.2
	KETE	*Keckiella ternata*	0.3	0.1	0.2	0.2
	SAME5	*Sambucus mexicana*	0.3	0.1	0.2	0.2
	TODI	*Toxicodendron diversilobum*	0.3	0.1	0.2	0.2
Herbaceous						
	BRTE	*Bromus tectorum*	1	2.1	0.2	3
	CRYPT	*Cryptantha*	1	1.8	0.2	5
	DICH	*Dicentra chrysantha*	0.3	1.3	4	4
	GAAN2	*Galium angustifolium*	0.3	0.7	2	2
	HUCA	*Hulsea californica*	0.3	0.7	2	2
	CLPE	*Claytonia perfoliata*	0.3	0.3	1	1
	ERCI6	*Erodium cicutarium*	0.3	0.3	1	1
	HEGR3	*Helianthus gracilentus*	0.3	0.3	1	1
	LASE	*Lactuca serriola*	0.3	0.3	1	1
	SOXA	*Solanum xanti*	0.3	0.3	1	1
	BRMA3	*Bromus madritensis*	0.3	0.1	0.2	0.2
	CALYS	*Calystegia*	0.3	0.1	0.2	0.2
	LAVEA4	*Lathyrus vestitus* var. *alefeldii*	0.3	0.1	0.2	0.2
	LOST4	*Lotus strigosus*	0.3	0.1	0.2	0.2

***Quercus wislizeni-Quercus berberidifolia* Alliance (Interior Live Oak - Scrub Oak)**

ASSOCIATIONS
Quercus wislizeni-Quercus berberidifolia

LOCAL VEGETATION DESCRIPTION
One stand of the *Quercus wislizeni-Quercus berberidifolia* Shrubland forms an intermittent shrub layer (39%), where *Quercus wislizeni* and *Q. berberidifolia* co-dominate. Shrubs occur in one main stratum at 1-2m tall. The herbaceous layer is open (20%) at 0-0.5m tall. Total vegetation cover is 55%.

In one stand of this alliance is the *Quercus wislizeni-Quercus berberidifolia* association, where the two main shrub species are *Quercus wislizeni* and *Q. berberidifolia*. Other species may occur at lower cover, including *Arctostaphylos glandulosa, Ceanothus leucodermis,* and *Cercocarpus betuloides*. Non-native and native herbs may be present, including *Bromus diandrus, B. tectorum, Camissonia, Lathyrus vestitus,* and *Lotus*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 4977 ft
Aspect: NE
Slope: somewhat steep, 21 degrees
Topography: convex; upper slope
Litter Cover: 10%
Rock Cover: 4%
Bare Ground: 85%
Parent Material: mixed granitic and metamorphic
Soil Texture: medium to very fine sandy loam

The *Quercus wislizeni-Quercus berberidifolia* Alliance was sampled within one large stand on a north-trending slope within the Palomar - Cuyamaca Peak (M262Bo) Subsection. The stand is a post-fire shrubland with variable cover of *Quercus wislizeni* and *Q. berberidifolia* (e.g., on Volcan Mountain after the Pines Fire of 2002), and the pre-fire stand had scattered *Pinus coulteri*.

Samples used to describe alliance: (n=1) SFVW132

RANK: G4 S4

GLOBAL DISTRIBUTION
Alliance: montane Transverse and Peninsular Ranges (including southern San Bernardino Mountains, Fontana Plain, Santa Ana, San Gorgonio, San Jacinto, and Volcan Mountains)

REFERENCES
Gordon and White 1994, Klein and Evens 2005, Minnich 1976, Sawyer and Keeler-Wolf 1995

***Quercus wislizeni-Quercus berberidifolia* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	QUBE5	*Quercus berberidifolia*	1	30	30	30
	QUWIF	*Quercus wislizeni* var. *frutescens*	1	10	10	10
	CELE2	*Ceanothus leucodermis*	1	5	5	5
	ARGL3	*Arctostaphylos glandulosa*	1	1	1	1
	CEBE3	*Cercocarpus betuloides*	1	1	1	1
	ERPA24	*Ericameria parishii*	1	1	1	1
Herbaceous						
	BRTE	*Bromus tectorum*	1	10	10	10
	BRDI3	*Bromus diandrus*	1	8	8	8
	CAMIS	*Camissonia*	1	2	2	2
	CLPE	*Claytonia perfoliata*	1	1	1	1
	LAVEA4	*Lathyrus vestitus* var. *alefeldii*	1	1	1	1
	GAAN2	*Galium angustifolium*	1	0.2	0.2	0.2
	LOTUS	*Lotus*	1	0.2	0.2	0.2

***Rhamnus tomentella* Alliance (Chaparral Coffeeberry)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
The stand of *Rhamnus tomentella* Shrubland forms an intermittent shrub layer (60%), where *Rhamnus tomentella* dominates or co-dominates. The herbaceous layer is sparse (4%). Trees occur as emergents (3%). Total vegetation cover is 60%.

In one sample of *Rhamnus tomentella* Alliance, *Rhamnus tomentella* subsp. *tomentella* is dominant. Other shrubs such as *Sambucus mexicana* and *Ribes roezlii* are present but in lower cover. *Quercus chrysolepis* is emergent in the overstory, and a variety of herbaceous species occur in the understory in low cover, including *Avena barbata* and *Solidago californica*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, 5384 ft
Aspect: SE
Slope: moderate, 12 degrees
Topography: convex, upper slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed granitic and metamorphic
Soil Texture: no data

The *Rhamnus tomentella* Alliance was sampled only within the Palomar - Cuyamaca Peak (M262Bo) Subsection on the upper, neutral slopes of Volcan Mountain.

Samples used to describe alliance: (n=1) SDRP0208

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 W Riverside and San Diego Counties), though full distribution is not known

REFERENCES
Evens and San 2004, Evens et al. 2004, Klein and Evens 2005, CNPS unpublished rapid assessment data (2002-2003)

***Rhamnus tomentella* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	QUCH2-t	*Quercus chrysolepis*	1	3	3	3
Shrub						
	RHTO6	*Rhamnus tomentella*	1	55	55	55
	SAME5	*Sambucus mexicana*	1	4	4	4
	RIRO	*Ribes roezlii*	1	3	3	3
	TODI	*Toxicodendron diversilobum*	1	2	2	2
	PRVI	*Prunus virginiana*	1	0.2	0.2	0.2
	ERWR	*Eriogonum wrightii*	1	0.2	0.2	0.2
Herbaceous						
	AVBA	*Avena barbata*	1	3	3	3
	SOCA5	*Solidago californica*	1	1	1	1
	BRDI3	*Bromus diandrus*	1	0.2	0.2	0.2
	STEX	*Stephanomeria exigua*	1	0.2	0.2	0.2
	CIOC	*Cirsium occidentale*	1	0.2	0.2	0.2
	HIIN3	*Hirschfeldia incana*	1	0.2	0.2	0.2
	LEFI11	*Lessingia filaginifolia*	1	0.2	0.2	0.2
	LUPIN	*Lupinus*	1	0.2	0.2	0.2
	OSBR	*Osmorhiza brachypoda*	1	0.2	0.2	0.2
	BRTE	*Bromus tectorum*	1	0.2	0.2	0.2
	ERFO2	*Erigeron foliosus*	1	0.2	0.2	0.2
	ERCI6	*Erodium cicutarium*	1	0.2	0.2	0.2
	ASER2	*Asclepias erosa*	1	0.2	0.2	0.2

***Rhus integrifolia* Alliance (Lemonade Berry)**

ASSOCIATIONS
Rhus integrifolia-Artemisia californica-Adenostoma fasciculatum
Rhus integrifolia-Artemisia californica-Salvia mellifera

LOCAL VEGETATION DESCRIPTION
Stands of *Rhus integrifolia* Shrubland form an open to continuous shrub layer (22-95%, mean 60.1%), where *Rhus integrifolia* dominates or co-dominates. Shrubs often occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-15m tall. The herbaceous layer is sparse to intermittent (0.2-36%, mean 9%) at 0-1m tall. Trees seldom occur as emergents (2% cover, mean 2%) at 5-10m tall. Total vegetation cover is 50-95%, mean 67.3%.

In the *Rhus integrifolia-Adenostoma fasciculatum-Artemisia californica* Association, *Rhus integrifolia*, Adenostoma *fasciculatum,* and *Artemisia californica* are co-dominant. *Eriogonum fasciculatum*, *Mimulus aurantiacus,* and *Xylococcus bicolor* may also be present and sometimes co-dominant.

In the *Rhus integrifolia-Salvia mellifera-Artemisia californica* Association, *Rhus integrifolia* is co-dominant with *Salvia mellifera* and *Artemisia californica* (or *R. integrifolia* may be dominant with the other two shrubs sub-dominant). *Malosma laurina* is usually present and sometimes co-dominant. A variety of other shrubs, including *Mimulus aurantiacus, Opuntia littoralis,* and *Heteromeles arbutifolia,* may also be present.

Four different rare plant species were found in the *Rhus integrifolia* Alliance, with CNPS (2005) ranks provided. *Adolphia californica*, a CNPS List 2 species, was found in 2 of the 16 surveys. *Ceanothus verrucosus*, a CNPS List 2 species, was found in 1 survey. *Comarostaphylis diversifolia* subsp. *diversifolia*, a CNPS List 1B species, was found in 3 surveys. *Quercus dumosa*, a CNPS List 1B species, was found in 4 surveys. See Appendix 3 for more information on these plants.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 52-365 ft, mean 239 ft
Aspect: more often NW or NE, occasionally variable
Slope: gentle to steep, range 2-36 degrees, mean 20.7 degrees
Topography: more often undulating, occasionally convex or concave, bottom to upper slope
Litter Cover: range 25-94%, mean 72.4%
Rock Cover: range 0-33%, mean 6.2%
Bare Ground: range 0.2-50%, mean 16.3%
Parent Material: usually sandstone, occasionally Mesozoic granite or alluvium and other deposits
Soil Texture: more often medium to very fine loamy sand, occasionally moderately fine sandy clay loam or moderately fine clay loam, or clays

The *Rhus integrifolia* Alliance was sampled in western portion of the study area in the Coastal Terraces (261Bj) and Coastal Hills (261Bi) Subsections. It usually occurs on northerly slopes, usually with sandstone foundation including coastal bluffs. This alliance has expanded its range substantially since the 1930's.

Samples used to describe alliance: (n=16) SDRP0062, SDRP0096, SDRP0236, SDRP0251, SDRP0252, SDRP0254, SDRP0256, SDRP0262, SDRP0270, SDRP0271, SDRP0277, SDRP0283, SDRP0284, SDRP0402, SDRP0403, SDRP0404

RANK: G3 S3?

GLOBAL DISTRIBUTION
Alliance: coastal hills and terraces of the South Coast (including Ventura County south to San Diego County), western Transverse Ranges (including Santa Monica Mountains)

Rhus integrifolia-Adenostoma fasciculatum-Artemisia californica Association: coastal hills and terraces of San Diego County, though full distribution is not known
Rhus integrifolia-Salvia mellifera-Artemisia californica Association: coastal hills and terraces of San Diego County, though full distribution is not known

REFERENCES
CNPS and CDFG 2005b, Sawyer and Keeler-Wolf 1995, Taylor 2004

***Rhus integrifolia* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	RHIN2	*Rhus integrifolia*	1	23.6	2	85
	ARCA11	*Artemisia californica*	1	9.8	1	35
	MIAU	*Mimulus aurantiacus*	0.8	4.5	0.2	25
	SAME3	*Salvia mellifera*	0.8	5.1	0.2	18
	MALA6	*Malosma laurina*	0.7	4.3	0.2	30
	XYBI	*Xylococcus bicolor*	0.5	2.6	0.2	14
	ERFA2	*Eriogonum fasciculatum*	0.5	2.4	0.2	15
	HEAR5	*Heteromeles arbutifolia*	0.5	2.2	0.2	13
	ADFA	*Adenostoma fasciculatum*	0.4	3.6	0.2	30
	OPLI3	*Opuntia littoralis*	0.4	0.8	0.2	5
	RHCR	*Rhamnus crocea*	0.4	0.4	0.2	2
	BASA2	*Baccharis sarothroides*	0.3	0.7	0.2	9
	LOSC2	*Lotus scoparius*	0.3	0.7	0.2	5
	QUDU	*Quercus dumosa*	0.3	2.6	1	33
	HASQ2	*Hazardia squarrosa*	0.3	0.2	0.2	1
Herbaceous						
	BRMA3	*Bromus madritensis*	0.4	1.7	0.2	15
	BRASS2	*Brassica*	0.3	0.5	0.2	6

***Rhus ovata* Alliance (Sugarbush)**

ASSOCIATIONS
Rhus ovata-Ziziphus parryi

LOCAL VEGETATION DESCRIPTION
Stands of *Rhus ovata* Shrubland form an open to intermittent shrub layer (5-31%, mean 16.5%), where *Rhus ovata* dominates or it co-dominates with desert-transition shrubs. Shrubs regularly occur in two different strata, with low shrubs at 0.5-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is also open to intermittent (28-55%, mean 38.5%) at 0-1m tall. Total vegetation cover is 37-63%, mean 50.8%.

In the *Rhus ovata - Ziziphus parryi* Association, *Rhus ovata* usually co-dominates with *Ziziphus parryi*. Other shrubs may be sub-dominant to co-dominant, including *Prunus fasciculata, Simmondsia chinensis, Yucca schidigera,* and *Opuntia* spp.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 2562-3314 ft, mean 2892 ft
Aspect: NE or NW
Slope: gentle to moderate, range 2-7 degrees, mean 3.8 degrees
Topography: flat to undulating; lower to upper slope
Litter Cover: range 2-5%, mean 3.7%
Rock Cover: range 10-55%, mean 31.4%
Bare Ground: range 38-93%, mean 71.3%
Parent Material: alluvium, mixed granitic and metamorphic
Soil Texture: often medium to very fine sandy loam, sometimes medium to very fine loamy sand

The *Rhus ovata* Alliance was sampled on gentle to moderate, north-trending slopes along the lower, east-side of Volcan Mountain at the edge of the Palomar - Cuyamaca Peak (M262Bo) Subsection and into the Desert Slopes (M262Bp) Subsection.

Samples used to describe alliance: (n=4) SFVW065, SFVW079, SFVW091, SFVW142

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

GLOBAL DISTRIBUTION
Alliance: South Coast and western Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (Western Riverside County: San Jacinto Foothills, San Diego County-Palomar), Colorado Desert (including Anza-Borrego Desert and adjacent San Felipe Valley area), though full distribution is not known
Rhus ovata-Ziziphus parryi Association: Peninsular Ranges (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, Klein and Evens 2005

***Rhus ovata* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	RHOV	*Rhus ovata*	1	4.3	2	8
	ZIPA	*Ziziphus parryi*	1	1.1	0.2	2
	LOSC2	*Lotus scoparius*	0.75	1.3	1	2

***Rhus ovata* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
	ACGR	*Acacia greggii*	0.5	0.8	1	2
	YUSC2	*Yucca schidigera*	0.5	0.5	1	1
	CEIN3	*Ceanothus integerrimus*	0.5	0.1	0.2	0.2
	MADE	*Malacothamnus densiflorus*	0.25	3.8	15	15
	OPAC	*Opuntia acanthocarpa*	0.25	1.3	5	5
	ERTR7	*Eriodictyon trichocalyx*	0.25	0.8	3	3
	PRFA	*Prunus fasciculata*	0.25	0.8	3	3
	SICH	*Simmondsia chinensis*	0.25	0.8	3	3
	JUCA7	*Juniperus californica*	0.25	0.5	2	2
	SAAP2	*Salvia apiana*	0.25	0.5	2	2
	ERLI6	*Ericameria linearifolia*	0.25	0.3	1	1
	YUWH	*Yucca whipplei*	0.25	0.3	1	1
	CEGR	*Ceanothus greggii*	0.25	0.1	0.2	0.2
	ENAC	*Encelia actonii*	0.25	0.1	0.2	0.2
	ERFA2	*Eriogonum fasciculatum*	0.25	0.1	0.2	0.2
	PRFR	*Prunus fremontii*	0.25	0.1	0.2	0.2
	SAME5	*Sambucus mexicana*	0.25	0.1	0.2	0.2
	VIPA14	*Viguiera parishii*	0.25	0.1	0.2	0.2
Herbaceous						
	BRMA3	*Bromus madritensis*	1	22.3	19	30
	ERCI6	*Erodium cicutarium*	0.75	7.1	0.2	20
	SCHIS	*Schismus*	0.5	3.3	1	12
	MAMA8	*Marah macrocarpus*	0.5	0.5	1	1
	CRYPT	*Cryptantha*	0.5	0.1	0.2	0.2
	AVFA	*Avena fatua*	0.25	2.0	8	8
	LUBI	*Lupinus bicolor*	0.25	1.3	5	5
	LUCO	*Lupinus concinnus*	0.25	1.3	5	5
	LACA7	*Lasthenia californica*	0.25	0.5	2	2
	PLAR	*Plagiobothrys arizonicus*	0.25	0.5	2	2
	CRIN8	*Cryptantha intermedia*	0.25	0.3	1	1
	AMMEI2	*Amsinckia menziesii* var. *intermedia*	0.25	0.1	0.2	0.2
	CAMIS	*Camissonia*	0.25	0.1	0.2	0.2
	CAST20	*Camissonia strigulosa*	0.25	0.1	0.2	0.2
	DESCU	*Descurainia*	0.25	0.1	0.2	0.2
	DICA14	*Dichelostemma capitatum*	0.25	0.1	0.2	0.2
	DICH	*Dicentra chrysantha*	0.25	0.1	0.2	0.2
	GICA5	*Gilia capitata*	0.25	0.1	0.2	0.2
	LOST4	*Lotus strigosus*	0.25	0.1	0.2	0.2
	PHDI	*Phacelia distans*	0.25	0.1	0.2	0.2
	SACO6	*Salvia columbariae*	0.25	0.1	0.2	0.2

***Rhus trilobata* Alliance (Skunkbrush or Basket Bush)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
A stand of *Rhus trilobata* Shrubland forms a continuous shrub layer (83%), where *Rhus trilobata* dominates. The herbaceous layer is open (10%). Total vegetation cover is 90%.

In one sample of the *Rhus trilobata* Alliance, *Rhus trilobata* is dominant in the shrub layer. A variety of herbs occur in the understory, including *Bromus tectorum* and *Erigeron foliosus*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, 5317 ft
Aspect: SW
Slope: moderate, 11 degrees
Topography: undulating, upper slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed granitic and metamorphic
Soil Texture: no data

The *Rhus trilobata* Alliance was sampled only within the Palomar - Cuyamaca Peak (M262Bo) Subsection on Volcan Mountain in small stands along exposed and often wind-pruned surfaces adjacent to dry meadows.

Samples used to describe alliance: (n=1) SDRP0207

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: South Coast and Peninsular Ranges (including W Riverside County: Perris Valley and hills, San Diego County: Palomar - Cuyamaca Peak region), Anza-Borrego Desert, though full distribution is not known. Similar alliances (the *Rhus trilobata* Shrub Herbaceous Alliance and the *Rhus trilobata* Intermittently Flooded Shrubland Alliance) has been reported in the Rocky Mountain and Great Basin states.

REFERENCES
CDFG 1998, Klein and Evens 2005, NatureServe 2004

***Rhus trilobata* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	RHTR	*Rhus trilobata*	1	80	80	80
	ERWR	*Eriogonum wrightii*	1	4	4	4
	SAME5	*Sambucus mexicana*	1	1	1	1
	TODI	*Toxicodendron diversilobum*	1	1	1	1
	RIRO	*Ribes roezlii*	1	1	1	1
Herbaceous						
	ERFO2	*Erigeron foliosus*	1	6	6	6
	BRTE	*Bromus tectorum*	1	2	2	2
	LEFI11	*Lessingia filaginifolia*	1	0.2	0.2	0.2
	AVBA	*Avena barbata*	1	0.2	0.2	0.2
	PTAQ	*Pteridium aquilinum*	1	0.2	0.2	0.2
	STEX	*Stephanomeria exigua*	1	0.2	0.2	0.2
	BRDI3	*Bromus diandrus*	1	0.2	0.2	0.2
	ARDR4	*Artemisia dracunculus*	1	0.2	0.2	0.2
	CRIN8	*Cryptantha intermedia*	1	0.2	0.2	0.2
	CAOC6	*Calystegia occidentalis*	1	0.2	0.2	0.2

***Rosa californica* Alliance (California Rose)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
A stand of *Rosa californica* Shrubland forms a continuous shrub layer (90%), where *Rosa californica* dominates. The herbaceous layer is open (10%). Total vegetation cover is 97%.

In one sample of the *Rosa californica* Alliance, *Rosa californica* is dominant in the shrub layer. The understory includes non-native species such as *Urtica dioica, Bromus* spp., and *Rubus discolor.*

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, 3931 ft
Aspect: NW
Slope: steep, 30 degrees
Topography: convex, bottom
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed granitic and metamorphic
Soil Texture: no data

The *Rosa californica* Alliance was sampled only within the Palomar - Cuyamaca Peak (M262Bo) Subsection in the Santa Ysabel Ranch area, adjacent to perennial streams on sloping creek bottoms.

Samples used to describe alliance: (n=1) SDRP0011

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: riparian habitats in the Central Valley (including Suisun Marsh and the Sacramento-San Joaquin Delta area), western Transverse and Peninsular Ranges (including Ventura and San Diego Counties), though full distribution is not known

REFERENCES
CDFG 2000, CNPS and CDFG 2005b

***Rosa californica* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	ROCA2	*Rosa californica*	1	90	90	90
	SYMO	*Symphoricarpos mollis*	1	1	1	1
Herbaceous						
	URDI	*Urtica dioica*	1	5	5	5
	BRAR3	*Bromus arenarius*	1	3	3	3
	RUDI2	*Rubus discolor*	1	2	2	2
	BRASS2	*Brassica*	1	1	1	1
	BRDI3	*Bromus diandrus*	1	1	1	1

***Salicornia subterminalis* Alliance (Parish's Glasswort, Pickleweed)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Stands of *Salicornia subterminalis* form an open to intermittent shrub layer (10-35%, mean 22.5%) at 0-5m tall, where *Salicornia subterminalis* dominates. The herbaceous layer is open to continuous (20-75%, mean 47.5%) at 0-0.5m tall. Total vegetation cover is 50-80%, mean 65%.

In the *Salicornia subterminalis* Alliance, *Salicornia subterminalis* dominates in the shrub layer. The herb layer is dominated by non-native species such as *Centaurea melitensis, Erodium* spp., and *Bromus* spp.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 43-59 ft, mean 51 ft
Aspect: NE
Slope: moderate, range 6-10 degrees, mean 8.0 degrees
Topography: flat or undulating, lower slopes
Litter Cover: range 59.3-86%, mean 72.8%
Rock Cover: range 0.4-0%, mean 0.4%
Bare Ground: range 8-35%, mean 21.5%
Parent Material: sandstone
Soil Texture: medium to very fine loamy sand

The *Salicornia subterminalis* Alliance was sampled only within the Coastal Terraces (261Bj) Subsection in the San Dieguito Lagoon area. Stands are impacted by development, weed invasions, erosion, social trails, etc.

Samples used to describe alliance: (n=2) SDRP0259, SDRP0342

RANK: S3 G3

GLOBAL DISTRIBUTION
Alliance: salt marshes in the South Coast (San Diego County and probably north to Ventura County) of California

REFERENCES
CNPS and CDFG 2005b

***Salicornia subterminalis* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	SASU2	*Salicornia subterminalis*	1	19.5	4	35
	ATSE	*Atriplex semibaccata*	0.5	1.5	3	3
	ERFA2	*Eriogonum fasciculatum*	0.5	0.5	1	1
	ATLE	*Atriplex lentiformis*	0.5	0.5	1	1
	ISME5	*Isocoma menziesii*	0.5	0.5	1	1
	BAPI	*Baccharis pilularis*	0.5	0.5	1	1
Herbaceous						
	CEME2	*Centaurea melitensis*	1	3.5	2	5
	BRDI3	*Bromus diandrus*	0.5	12.5	25	25
	ERODI	*Erodium (brachycarpum, botrys, and moschatum)*	0.5	12.5	25	25
	AVFA	*Avena fatua*	0.5	7.5	15	15
	BRMA3	*Bromus madritensis*	0.5	5	10	10
	BRHO2	*Bromus hordeaceus*	0.5	5	10	10
	BRASS2	*Brassica*	0.5	1.5	3	3
	CARPO	*Carpobrotus*	0.5	1	2	2
	SATR12	*Salsola tragus*	0.5	1	2	2

***Salicornia virginica* Alliance (Common Pickleweed)**

ASSOCIATIONS
Salicornia virginica-Salicornia subterminalis

LOCAL VEGETATION DESCRIPTION
Stands of *Salicornia virginica* form an open to continuous shrub (or herb) layer (15-80%, mean 32.2%) at 0.5-5m tall, where *Salicornia virginica* dominates or co-dominates. The herbaceous layer is sparse to continuous (0.2-85%, mean 33.6%) at 0-0.5m tall. Total vegetation cover is 1-90%, mean 65.2%.

In the *Salicornia virginica-Salicornia subterminalis* Association, *Salicornia virginica* dominates while *Salicornia subterminalis* is sub-dominant to co-dominant. *Isocoma menziesii* is found in low cover. The herbaceous layer is variable and includes species such as *Salsola tragus* and *Distichlis spicata.*

Note: *Salicornia virginica* is sometimes considered an herb, though it can also be considered a sub-shrub as does this study.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 11-45 ft, mean 22 ft
Aspect: variable, more often flat
Slope: flat to gentle, range 0-3 degrees, mean 1.0 degrees
Topography: often flat, occasionally undulating or convex, often bottom, occasionally lower slope
Litter Cover: range 0-94%, mean 63.9%
Rock Cover: range 0.2-0%, mean 0.3%
Bare Ground: range 0.2-99%, mean 29.3%
Parent Material: more often alluvium and other deposits, occasionally sandstone
Soil Texture: often muck, occasionally medium silt or medium silt loam

The *Salicornia virginica* Alliance was sampled only within the Coastal Terraces (261Bj) Subsection in patches throughout the San Dieguito Lagoon. Stands are impacted by development, weed invasions, etc.

Samples used to describe alliance: (n=5) SDRP0336, SDRP0338, SDRP0340, SDRP0343, SDRP0344

RANK: G2 S2, G3 S3, and G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Central Coast to Central Valley (including Point Reyes and Suisun Marsh) and South Coast (including Ventura to San Diego Counties) in California; Washington, British Columbia

Salicornia virginica-Salicornia subterminalis Association: coastal salt marshes in the South Coast (including Ventura and San Diego Counties) of California

REFERENCES
Atwater et al. 1979, CDFG 2000, CNPS and CDFG 2005b, Ferren 1989, NatureServe 2004, NatureServe et al. 2003a

***Salicornia virginica* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	SAVI	*Salicornia virginica*	1	44.4	1	66
	SASU2	*Salicornia subterminalis*	0.8	14.8	14	25
	ISME5	*Isocoma menziesii*	0.8	3.3	0.2	10
	FRSA	*Frankenia salina*	0.4	0.4	0.2	2
	ATLE	*Atriplex lentiformis*	0.2	0.8	4	4
	MYLA5	*Myoporum laetum*	0.2	0.2	1	1
Herbaceous						
	SATR12	*Salsola tragus*	0.6	0.9	0.2	4
	DISP	*Distichlis spicata*	0.6	0.6	0.2	2
	MECR3	*Mesembryanthemum crystallinum*	0.4	1.4	1	6
	HIIN3	*Hirschfeldia incana*	0.4	0.8	0.2	4
	CACH38	*Carpobrotus chilensis*	0.2	0.6	3	3
	COJU2	*Cortaderia jubata*	0.2	0.2	1	1
	BRDI3	*Bromus diandrus*	0.2	0.2	1	1
	CARPO	*Carpobrotus*	0.2	0.2	1	1

***Salix exigua* Alliance (Narrowleaf Willow)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
One stand of *Salix exigua* Shrubland forms an open shrub layer (20%), where *Salix exigua* solely dominates. Shrubs occur in two different strata, with low shrubs at 1-2m tall and tall shrubs at 2-5m tall. The herbaceous layer is intermittent (55%) at 0-0.5m tall. Trees may occur as sparse emergents. Total vegetation cover is 75%.

In one stand of this alliance, *Salix exigua* occurs as the dominant shrub in the overstory. Other shrubs, such as *Baccharis salicifolia* and *Prosopis glandulosa* also occur. Herbs are abundant in the understory, including *Bromus madritensis, Medicago polymorpha,* and *Lupinus bicolor.*

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 2608 ft
Aspect: flat/none
Slope: 0 degrees
Topography: flat to undulating
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed alluvium
Soil Texture: no data

One stand of the *Salix exigua* Alliance was sampled on a relatively flat, riparian floodplain within the San Felipe Wash area in the Desert Slopes (M262Bp) Subsection.

Samples used to describe alliance: (n=1) SFVW103

RANK: G5 S5 (though associations may be rare)

GLOBAL DISTRIBUTION
Alliance: widely known from much of North America in both Canada and the United States (including the following states: USA: AR, AZ, CA, CO, IA, ID, IL, IN, KS, KY(?), MT, ND, NE, NM, NV, OH(?), OK, OR, PA(?), SD, TN(?),TX, UT, WA, WY).

REFERENCES
NatureServe 2004, Sawyer and Keeler-Wolf 1995, Vaghti 2003

***Salix exigua* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	SAEX	*Salix exigua*	1	15.0	15	15
	PRGL2	*Prosopis glandulosa*	1	3.0	3	3
	BASA4	*Baccharis salicifolia*	1	0.2	0.2	0.2
	RIMA	*Ribes malvaceum*	1	0.2	0.2	0.2
Herbaceous						
	BRMA3	*Bromus madritensis*	1	30.0	30	30
	MEPO3	*Medicago polymorpha*	1	15.0	15	15
	PLAR	*Plagiobothrys arizonicus*	1	6.0	6	6
	LUBI	*Lupinus bicolor*	1	4.0	4	4

***Salix lasiolepis* Alliance (Arroyo Willow)**

ASSOCIATIONS
Salix lasiolepis/*Baccharis salicifolia*

LOCAL VEGETATION DESCRIPTION
Stands of *Salix lasiolepis* Shrubland form an open to continuous shrub (or small tree) layer (11-92%, mean 42%) at 1-10m, where *Salix lasiolepis* dominates. The herbaceous layer is sparse to continuous (1-80%, mean 22.8%) at 0-2m tall. Trees occasionally occur as emergents (0.2-76% cover, mean 24.8%) at 5-10m tall. Total vegetation cover is 45-96%, mean 73.4%.

In the *Salix lasiolepis*/*Baccharis salicifolia* Assocation, *Salix lasiolepis* dominates the shrub layer or tree layer while *Baccharis salicifolia* is often found in the shrub layer as well. The herbaceous layer often includes non-native species, such as *Bromus diandrus, Urtica dioica,* or *Bromus madritensis,* though a variety of native species may also occur, including *Galium aparine, Scirpus, Typha,* and *Juncus effusus.*

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 119-5251 ft, mean 2244 ft
Aspect: NW or flat, occasionally NE
Slope: flat to steep, range 0-30 degrees, mean 10.6 degrees
Topography: flat to concave, usually bottom slope
Litter Cover: range 47.5-95%, mean 71.3%
Rock Cover: range 0-7%, mean 3.6%
Bare Ground: range 0.2-40%, mean 20.1%
Parent Material: Mesozoic granite or mixed granitic and metamorphic, occasionally sandstone
Soil Texture: medium silt loam (from one plot)

Salix lasiolepis Alliance was sampled in all but the eastern-most subsection of the study area: Coastal Terraces (261Bj), Coastal Hills (261Bi), Western Granitic Foothills (M262Bn), and Palomar - Cuyamaca Peak (M262Bo). It occurs along a broad ecological range from seasonally wet montane slopes of Volcan Mountain down to seasonal creekbeds of coastal terrace.

Samples used to describe alliance: (n=5) SDRP0010, SDRP0066, SDRP0215, SDRP0287, SDRP0339

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

GLOBAL DISTRIBUTION
Alliance: North and Central Coast, Central Valley, Klamath foothills, Cascade Range foothills, Sierra Nevada foothills and montane, Southern California, Peninsular Ranges (including W Riverside and San Diego Counties), Anza-Borrego Desert, Great Basin; Baja California

Salix lasiolepis/*Baccharis salicifolia* Assocation: Southern California Coast Ranges (including Santa Monica Mountains and coast to foothills of San Diego County)

REFERENCES
Borchert et al. 2004, CDFG 1998, CNPS and CDFG 2005b, Klein and Evens 2005, NatureServe et al. 2003b, Potter 2003, Sawyer and Keeler-Wolf 1995, Smith 1998, Zembal 1989

***Salix lasiolepis* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	QUCH2-t	*Quercus chrysolepis*	0.2	0.2	1	1
Tree Understory						
	SALA6-t	*Salix lasiolepis*	0.8	47.4	19	88
	PLRA-m	*Platanus racemosa*	0.2	0.8	4	4
Shrub						
	BASA4	*Baccharis salicifolia*	0.6	2.8	1	11
	SALA6-m	*Salix lasiolepis*	0.4	7.4	7	30
	TODI	*Toxicodendron diversilobum*	0.4	0.4	0.2	2
	RHTO6	*Rhamnus tomentella*	0.2	3	15	15
	SAME5	*Sambucus mexicana*	0.2	0.6	3	3
	RHTR	*Rhus trilobata*	0.2	0.4	2	2
	FRSA	*Frankenia salina*	0.2	0.2	1	1
	TAMAR2	*Tamarix*	0.2	0.2	1	1
Herbaceous						
	BRDI3	*Bromus diandrus*	0.4	9.8	4	45
	URDI	*Urtica dioica*	0.2	9	45	45
	BROMU	*Bromus*	0.2	2.4	12	12
	BRMA3	*Bromus madritensis*	0.2	2.2	11	11
	GAAP2	*Galium aparine*	0.2	1.6	8	8
	CLPE	*Claytonia perfoliata*	0.2	1	5	5
	STME2	*Stellaria media*	0.2	1	5	5
	SCIRP	*Scirpus*	0.2	0.8	4	4
	TYPHA	*Typha*	0.2	0.4	2	2
	JUEFP	*Juncus effusus* var. *pacificus*	0.2	0.4	2	2
	AMPS	*Ambrosia psilostachya*	0.2	0.2	1	1
	SCCA2	*Scrophularia californica*	0.2	0.2	1	1
	RUDI2	*Rubus discolor*	0.2	0.2	1	1
	RORIP	*Rorippa*	0.2	0.2	1	1
	COMA2	*Conium maculatum*	0.2	0.2	1	1

***Salvia apiana* Alliance (White Sage)**

ASSOCIATIONS
Salvia apiana-Yucca whipplei

LOCAL VEGETATION DESCRIPTION
Stands of *Salvia apiana* Shrubland form a sparse to continuous shrub layer (9-75%, mean 48.7%) at 0-0.5m tall, where *Salvia apiana* dominates. The herbaceous layer is sparse (1-3%, mean 1.7%) at 0-0.5m tall. Total vegetation cover is 10-75%, mean 50%.

In the *Salvia apiana-Yucca whipplei* Association, *Salvia apiana* is dominant while *Yucca whipplei* is found characteristically in low cover. A diverse number of other shrubs may also be present in low cover. The herbaceous layer is often sparse and includes a variety of native and non-native species.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2028-3925 ft, mean 3213 ft
Aspect: often SW, occasionally NW
Slope: moderate to steep, range 12-30 degrees, mean 24.0 degrees
Topography: undulating
Litter Cover: range 4.7-5%, mean 4.7%
Rock Cover: range 12-12%, mean 12%
Bare Ground: range 78-78%, mean 78%
Parent Material: often mixed granitic and metamorphic
Soil Texture: moderately fine sandy clay loam (from one plot)

The *Salvia apiana* Alliance was sampled in the middle to eastern portions of the study area in the Western Granitic Foothills (M262Bn) and Palomar - Cuyamaca Peak (M262Bo) Subsections. They occurred in Pamo Valley east to Santa Ysabel Ranch, usually on exposed south-facing slopes intermixed with granitoid rocks.

Samples used to describe alliance: (n=3) SDRP0001, SDRP0023, SDRP0312

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: South Coast, montane Transverse Ranges and Peninsular Ranges (including W Riverside and San Diego Counties), Channel Islands; Baja California

Salvia apiana-Yucca whipplei Association: southern Peninsular Range (including western foothills of San Diego County), though full distribution is not known

REFERENCES
Klein and Evens 2005, Sawyer and Keeler-Wolf 1995

***Salvia apiana* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Understory						
	QUAG-m	*Quercus agrifolia*	0.3	0.3	1	1
Shrub						
	SAAP2	*Salvia apiana*	1	42.7	3	65
	YUWH	*Yucca whipplei*	1	1.7	0.2	3
	ERFA2	*Eriogonum fasciculatum*	0.7	0.1	0.2	0.2
	RHTO6	*Rhamnus tomentella*	0.3	2.7	8	8
	HASQ2	*Hazardia squarrosa*	0.3	1	3	3
	GUCA	*Gutierrezia californica*	0.3	0.3	1	1
Herbaceous						
	AVBA	*Avena barbata*	0.7	0.1	0.2	0.2
	ACCO21	*Achnatherum coronatum*	0.3	0.3	1	1

***Salvia mellifera* Alliance (Black Sage)**

ASSOCIATIONS
Salvia mellifera

LOCAL VEGETATION DESCRIPTION
Stands of *Salvia mellifera* Shrubland form an open to continuous shrub layer (24-90%, mean 48.6%) 0.5-5, where *Salvia mellifera* dominates. The herbaceous layer is sparse (0.2-3%, mean 2%) at 0-2m tall. Total vegetation cover is 25-90%, mean 49.4%.

In the *Salvia mellifera* Association, *Salvia mellifera* is the sole dominant shrub. Other shrubs are found in low cover, such as *Eriogonum fasciculatum* and *Artemisia californica.* The understory herbaceous layer consists of native species, such as *Leymus condensatus* and *Nassella lepida,* and non-native species, such as *Bromus madritensis,* and *Centaurea melitensis*.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 173-1248 ft, mean 679 ft
Aspect: often SW, occasionally SE or NW
Slope: gentle to somewhat steep, range 3-25 degrees, mean 13.6 degrees
Topography: variable, lower to upper slope
Litter Cover: range 21.7-22%, mean 21.7%
Rock Cover: range 7-7%, mean 7%
Bare Ground: range 4-66%, mean 35%
Parent Material: Mesozoic granite or sandstone, occasionally Metavolcanic
Soil Texture: more often moderately coarse sandy loam, occasionally moderately fine sandy clay loam or medium sand

The *Salvia mellifera* Alliance was sampled in the Coastal Terraces (261Bj), Coastal Hills (261Bi), and Western Granitic Foothills (M262Bn) Subsections. It is found from the coast to inland (Pamo Valley) on low elevation slopes that vary in topography, but are often exposed and south-facing.

Samples used to describe alliance: (n=5) SDRP0059, SDRP0061, SDRP0142, SDRP0235, SDRP0310

RANK: G3 S3 and G4S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Central Coast (including Contra Costa and Santa Clara County south to the Los Padres National Forest), South Coast (including Orange County to San Diego County), low elevation Transverse Ranges (including Santa Monica Mountains), Peninsular Ranges (including W Riverside and San Diego Counties), Channel Islands

Salvia mellifera Association: North Central Coast (including Contra Costa and Santa Clara County) south to the South Coast, Transverse, and Peninsular Ranges (including Ventura, Los Angeles, Orange, W Riverside, and San Diego Counties)

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, Holland 1986, Klein and Evens 2005, Malanson 1984, Sawyer and Keeler-Wolf 1995, White 1994

***Salvia mellifera* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	QUAG-t	*Quercus agrifolia*	0.2	0.2	1	1
Shrub						
	SAME3	*Salvia mellifera*	1	35.4	19	60
	ERFA2	*Eriogonum fasciculatum*	0.8	0.9	0.2	3
	ARCA11	*Artemisia californica*	0.6	2	0.2	9
	XYBI	*Xylococcus bicolor*	0.6	1.8	1	7
	MALA6	*Malosma laurina*	0.6	0.8	1	2
	CNDU	*Cneoridium dumosum*	0.4	2.4	0.2	12
	CEVE2	*Ceanothus verrucosus*	0.4	0.6	1	2
	GUCA	*Gutierrezia californica*	0.4	0.2	0.2	1
	LOSC2	*Lotus scoparius*	0.4	0.2	0.2	1
	RHIN2	*Rhus integrifolia*	0.4	0.2	0.2	1
	ERCR2	*Eriodictyon crassifolium*	0.2	8	40	40
	ADCA2	*Adolphia californica*	0.2	0.8	4	4
	HEAR5	*Heteromeles arbutifolia*	0.2	0.6	3	3
	SAME5	*Sambucus mexicana*	0.2	0.4	2	2
	CECR	*Ceanothus crassifolius*	0.2	0.4	2	2
Herbaceous						
	BRMA3	*Bromus madritensis*	0.6	0.8	0.2	2
	CEME2	*Centaurea melitensis*	0.6	0.1	0.2	0.2
	NALE2	*Nassella lepida*	0.4	0.4	0.2	2
	LECO12	*Leymus condensatus*	0.2	1.6	8	8
	STVI2	*Stephanomeria virgata*	0.2	0.2	1	1
Cryptogam						
	MOSS	Moss	0.4	0.8	0.2	4

***Sambucus mexicana* Alliance (Blue Elderberry)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
A stand of *Sambucus mexicana* Shrubland forms an open shrub layer (26%) at 1-5 m tall, where *Sambucus mexicana* dominates or co-dominates. The herbaceous layer is intermittent (50%) at 0-0.5m tall. Trees occur as emergents (0.2%) at 2-5m tall. Total vegetation cover is 70%.

In the one sample of the *Sambucus mexicana* Alliance, *Sambucus mexicana* dominates the shrub layer while the herb layer is dominated by native species *Claytonia perfoliata* and non-native species *Bromus* sp. and *Hirschfeldia incana.*

Iva hayesiana, a CNPS List 2 species (CNPS 2005), was found in the one survey of this alliance. See Appendix 3 for more information on this plant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 187 ft
Aspect: NE
Slope: gentle, 2 degrees
Topography: undulating, bottom to lower slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: sandstone
Soil Texture: moderately fine sandy clay loam

The *Sambucus mexicana* Alliance was sampled in the Coastal Hills (261Bi) Subsection in an intermittently flooded riparian terrace of Lusardi Creek, and it probably occurs in other disturbed, riparian habitats in the study area.

Samples used to describe alliance: (n=1) SDRP0151

RANK: G3 S3?

GLOBAL DISTRIBUTION
Alliance: Central and South Coast (including Marin County south to San Diego County), Transverse Ranges (including Santa Monica Mountains), Central Valley

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

***Sambucus mexicana* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Understory						
	SCMO	*Schinus molle*	1	0.2	0.2	0.2
Shrub						
	SAME5	*Sambucus mexicana*	1	20	20	20
	TODI	*Toxicodendron diversilobum*	1	1	1	1
	RISP	*Ribes speciosum*	1	1	1	1
	RHIN2	*Rhus integrifolia*	1	1	1	1
	BASA4	*Baccharis salicifolia*	1	0.2	0.2	0.2
	MEAL2	*Melilotus albus*	1	0.2	0.2	0.2
	ARCA11	*Artemisia californica*	1	0.2	0.2	0.2
	BEPI	*Berberis (pinnata)*	1	0.2	0.2	0.2
Herbaceous						
	BROMU	*Bromus*	1	20	20	20
	CLPE	*Claytonia perfoliata*	1	12	12	12
	HIIN3	*Hirschfeldia incana*	1	10	10	10
	COMA2	*Conium maculatum*	1	5	5	5
	SIMA3	*Silybum marianum*	1	2	2	2
	CAPY2	*Carduus pycnocephalus*	1	1	1	1
	FOVU	*Foeniculum vulgare*	1	0.2	0.2	0.2
	CLPA2	*Clematis pauciflora*	1	0.2	0.2	0.2
	IVHA	*Iva hayesiana*	1	0.2	0.2	0.2
	OXPE	*Oxalis pes-caprae*	1	0.2	0.2	0.2
	PHOLI2	*Pholistoma*	1	0.2	0.2	0.2
	STELL	*Stellaria*	1	0.2	0.2	0.2
	PIEC	*Picris echioides*	1	0.2	0.2	0.2
	PHOLI2	*Pholistoma (auritum)*	1	0.2	0.2	0.2
	ARDO4	*Arundo donax*	1	0.2	0.2	0.2
	ASSE12	*Asparagus setaceus*	1	0.2	0.2	0.2
	AVENA	*Avena*	1	0.2	0.2	0.2
Cryptogam						
	LICHEN	Lichen	1	0.2	0.2	0.2

***Tamarix* spp. Alliance (Tamarisk)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
A stand of *Tamarix* spp. Shrubland forms a continuous shrub layer (75%) at 2-5m tall, where *Tamarix* spp. dominate. The herbaceous layer is open (30%) at 0-0.5m tall. Trees occur as emergents at trace cover (1%) at 5-10m tall. Total vegetation cover is 98%.

In one sample of *Tamarix* spp. Alliance, *Tamarix* sp. dominates the shrub layer while *Lepidium latifolium* is found in the understory as a dominant. *Salix gooddingii* is found emergent in the tree layer.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 349 ft
Aspect: NW
Slope: flat, 0 degrees
Topography: flat, bottom
Litter Cover: no data
Rock Cover: no data
Bare Ground: 1%
Parent Material: no data
Soil Texture: moderately fine sandy clay loam

The *Tamarix* spp. Alliance was sampled only in the Coastal Hills (261Bi) Subsection within the Lake Hodges area and in the San Dieguito River east and west of the lake.

Samples used to describe alliance: (n=1) SDRP0244

RANK: none, invasive

GLOBAL DISTRIBUTION
Alliance: North Coast, inner Central Coast, Central Valley, southern Sierra Nevada foothills, southern Sierra Nevada foothills, South Coast, Peninsular Ranges (including W Riverside and San Diego Counties), Mojave Desert, Colorado Desert (including Anza-Borrego Desert)

REFERENCES
CDFG 1998, CNPS and CDFG 2005a, Klein and Evens 2005, Sawyer and Keeler-Wolf 1995, Thomas et al. 2004

***Tamarix* spp. Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	SAGO-t	*Salix gooddingii*	1	1	1	1
Shrub						
	TAMAR2	*Tamarix*	1	75	75	75
	BASA4	*Baccharis salicifolia*	1	2	2	2
Herbaceous						
	LELA2	*Lepidium latifolium*	1	30	30	30

***Toxicodendron diversilobum* Alliance (Poison Oak)**

ASSOCIATIONS
Toxicodendron diversilobum/ Pteridium aquilinum

LOCAL VEGETATION DESCRIPTION
Stands of *Toxicodendron diversilobum* form an open shrub layer (8-15%, mean 11.5%), where *Toxicodendron diversilobum* dominates. The herbaceous layer is intermittent (40-45%, mean 42.5%). Total vegetation cover is 45%, mean 45%.

In the *Toxicodendron diversilobum/Pteridium aquilinum* Association, *Toxicodendron diversilobum* dominates in the shrub layer at low to moderate cover. *Pteridium aquilinum* dominates in the herbaceous layer. Other herb species may be present including *Bromus* spp., *Lupinus* sp., and *Ambrosia psilostachya.*

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 5109-5334 ft, mean 5222 ft
Aspect: NW
Slope: moderate to somewhat steep, range 8-26 degrees, mean 17 degrees
Topography: undulating or convex, middle to upper slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed granitic and metamorphic
Soil Texture: sand (from one plot)

The *Toxicodendron diversilobum* Alliance was sampled only within the Palomar - Cuyamaca Peak (M262Bo) Subsection on Volcan Mountain on somewhat steep, dry slopes adjacent to meadows. Note: this is probably the highest elevation (surveyed so far) for this alliance.

Samples used to describe alliance: (n=2) SDRP0216, SDRP0225

RANK: G3 S3?

GLOBAL DISTRIBUTION
Alliance: South Coast and western Transverse Range (including Ventura and Los Angeles Counties: Santa Monica Mountains), Peninsular Ranges (including W Riverside-Santa Ana Mountains, San Diego County: Palomar - Cuyamaca Peak region). Full distribution is not known, but could range to northern California; also known to occur in Wisconsin, New York, and Ontario, Canada

Toxicodendron diversilobum/Pteridium aquilinum Association: Peninsular Ranges (including San Diego County: Palomar - Cuyamaca Peak region), though full distribution is not known

REFERENCES
CNPS and CDFG 2005b, NatureServe 2004, Vogl 1976

***Toxicodendron diversilobum* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	TODI	*Toxicodendron diversilobum*	1	11	7	15
	SAME5	*Sambucus mexicana*	1	0.6	0.2	1
	SYMO	*Symphoricarpos mollis*	0.5	0.1	0.2	0.2
Herbaceous						
	PTAQ	*Pteridium aquilinum*	1	31	27	35
	BRDI3	*Bromus diandrus*	1	10	5	15
	BRTE	*Bromus tectorum*	1	5.5	1	10
	LUPIN	*Lupinus*	0.5	1.5	3	3
	BRHO2	*Bromus hordeaceus*	0.5	1	2	2
	AMPS	*Ambrosia psilostachya*	0.5	0.5	1	1
	ACMI2	*Achillea millefolium*	0.5	0.1	0.2	0.2
	AVBA	*Avena barbata*	0.5	0.1	0.2	0.2
	ERFO2	*Erigeron foliosus*	0.5	0.1	0.2	0.2
	EPBR3	*Epilobium brachycarpum*	0.5	0.1	0.2	0.2
	LASE	*Lactuca serriola*	0.5	0.1	0.2	0.2

***Viguiera parishii* Alliance (Parish's Goldeneye)**

ASSOCIATIONS
Viguiera parishii-Agave deserti
Viguiera parishii-Eriogonum fasciculatum

LOCAL VEGETATION DESCRIPTION
Stands of *Viguiera parishii* Shrubland form an open shrub layer (10-18%, mean 13.7%), where *Viguiera parishii* is the dominant shrub or it is co-dominant with a mixture of succulent species. Shrubs may occur in two different strata, with low to medium shrubs at 0-2m tall and tall shrubs at 1-5m tall. The herbaceous layer is open to intermittent (22-35%, mean 28.7%) at 0-1m tall. Total vegetation cover is 31-50%, mean 39.2%.

In the *Viguiera parishii-Agave deserti* Association, *Viguiera parishii* is usually the most abundant species. *Agave deserti* is also present as a sub-dominant though may be co-dominant with *Viguiera* as well as other desert shrubs such as *Juniperus californicus* and *Opuntia acanthocarpa.* Other succulents may be present, including *Opuntia basilaris, Opuntia phaeacantha*, and *Yucca schidigera*.

In the *Viguiera parishii-Eriogonum fasciculatum* Association, *Viguiera parishii* is usually the most abundant species while *Acacia greggii, Eriogonum fasciculatum,* and *Opuntia acanthocarpa* are usually present as sub-dominants though are sometimes co-dominant with *Viguiera*. Herbaceous species may be abundant in the understory, including natives *Camissonia* spp., *Chaenactis* spp., *Cryptantha* spp., and *Salvia columbariae,* and non-natives *Bromus madritensis, Erodium cicutarium,* and *Schismus barbatus.*

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2569-5572 ft, mean 3328 ft
Aspect: SE, SW
Slope: somewhat steep to steep, range 22-40 degrees, mean 27.5 degrees
Topography: undulating; frequently middle slope, sometimes upper slope
Litter Cover: range 1.0-20%, mean 7.2%
Rock Cover: range 24.0-68%, mean 45.8%
Bare Ground: range 20.0-71%, mean 45.7%
Parent Material: mixed granitic and metamorphic
Soil Texture: medium to coarse loamy sand

The *Viguiera parishii* Alliance was sampled on moderately steep to steep, south-trending slopes, along the eastern edge of Volcan Mountain at the edge in the Palomar - Cuyamaca Peak (M262Bo) Subsection and into San Felipe Valley in the Desert Slopes (M262Bp) Subsection.

Samples used to describe alliance: (n=6) SFVW001, SFVW002, SFVW009, SFVW069, SFVW133, SFVW139

RANK: G3 S3?

GLOBAL DISTRIBUTION
Alliance: Anza-Borrego Desert and the eastern edge of Peninsular Range in San Diego County

Viguiera parishii-Agave deserti Association: Colorado Desert (San Diego County: Anza Borrego Desert and adjacent San Felipe Valley)
Viguiera parishii-Eriogonum fasciculatum Association: same as alliance

REFERENCES
CDFG 1998

***Viguiera parishii* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	VIPA14	*Viguiera parishii*	1	6.0	4	10
	ERFA2	*Eriogonum fasciculatum*	1	1.2	0.2	2
	OPAC	*Opuntia acanthocarpa*	0.66	1.5	0.2	5
	ACGR	*Acacia greggii*	0.66	0.6	0.2	2
	PRFR	*Prunus fremontii*	0.5	1.0	0.2	5
	YUSC2	*Yucca schidigera*	0.5	0.1	0.2	0.2
	YUWH	*Yucca whipplei*	0.5	0.1	0.2	0.2
	OPCH	*Opuntia chlorotica*	0.33	0.7	2	2
	JUCA7	*Juniperus californica*	0.33	0.5	0.2	3
	CHRYS9	*Chrysothamnus*	0.33	0.4	0.2	2
	RHOV	*Rhus ovata*	0.33	0.1	0.2	0.2
Herbaceous						
	SCHIS	*Schismus*	1	8.0	1	16
	BRMA3	*Bromus madritensis*	0.83	6.0	1	16
	ERCI6	*Erodium cicutarium*	0.66	6.2	5	12
	MIBI8	*Mirabilis bigelovii*	0.5	0.4	0.2	1
	CRYPT	*Cryptantha*	0.33	1.0	1	5
	SACO6	*Salvia columbariae*	0.33	1.0	1	5
	CACA32	*Camissonia californica*	0.33	0.2	0.2	1
	CRIN8	*Cryptantha intermedia*	0.33	0.2	0.2	1
	STLI3	*Stillingia linearifolia*	0.33	0.2	0.2	1
	DINE2	*Ditaxis neomexicana*	0.33	0.1	0.2	0.2
	PHDI	*Phacelia distans*	0.33	0.1	0.2	0.2
Epiphyte						
	PHCA8	*Phoradendron californicum*	0.33	0.1	0.2	0.2

Ambrosia psilostachya Alliance (Western Ragweed)

ASSOCIATIONS
Ambrosia psilostachya-Grindelia hirsutula var. *hallii*

LOCAL VEGETATION DESCRIPTION

Stands of *Ambrosia psilostachya* form an intermittent to continuous herbaceous layer (65-95%, mean 80%) at 0-0.5m tall, where *Ambrosia psilostachya* or co-dominates. Shrub and tree layers are relatively absent. Total vegetation cover is 65-95%, mean 80%.

In the *Ambrosia psilostachya-Grindelia hirsutula* var. *hallii* Association, *Ambrosia psilostachya* and *Grindelia hirsutula* var. *hallii* are co-dominants. A variety of other herbaceous species also can be found in this association (see species table).

Note: This should be considered a provisional alliance, especially because *Ambrosia psilostachya* is co-dominant with Grindelia and because there are only two samples.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, range 3946-4107 ft, mean 4027 ft
Aspect: NW or SW
Slope: gentle to moderate, range 2-8 degrees, mean 5.0 degrees
Topography: flat
Litter Cover: range 90-90%, mean 90%
Rock Cover: no data
Bare Ground: range 2-2%, mean 2%
Parent Material: mixed granitic and metamorphic or schist
Soil Texture: moderately fine sandy clay loam

The *Ambrosia psilostachya* Alliance was sampled only within the Palomar - Cuyamaca Peak (M262Bo) Subsection in the Santa Ysabel Ranch area, on intermittently wet and disturbed meadows.

Samples used to describe alliance: (n=2) SDRP0019, SDRP0181

RANK: S2 G2 to S4 G4? (depending on association)

GLOBAL DISTRIBUTION
Alliance: South Coast and Peninsular Ranges (including San Diego County). Full distribution is not known

Ambrosia psilostachya-Grindelia hirsutula var. *hallii* Association: Peninsular Ranges (San Diego County: Palomar - Cuyamaca Peak region)

REFERENCES
Moran 2004, UCB 2004

***Ambrosia psilostachya* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Herbaceous						
	GRHI	*Grindelia hirsutula (*var. *hallii)*	1	31	22	40
	AMPS	*Ambrosia psilostachya*	1	24	15	33
	HOMA2	*Hordeum marinum*	0.5	17.5	35	35
	SIBE	*Sisyrinchium bellum*	0.5	5	10	10
	BRHO2	*Bromus hordeaceus*	0.5	4	8	8
	SIMAS	*Sidalcea malviflora* subsp. *sparsifolia*	0.5	4	8	8
	JUME4	*Juncus mexicanus*	0.5	3.5	7	7
	HOMU	*Hordeum murinum*	0.5	2.5	5	5
	CYDA	*Cynodon dactylon*	0.5	2.5	5	5
	POA	*Poa*	0.5	1	2	2
	RACA2	*Ranunculus californicus*	0.5	1	2	2
	ERODI	*Erodium (brachycarpum, botrys, and moschatum)*	0.5	0.5	1	1
	VERBE	*Verbena*	0.5	0.1	0.2	0.2
	CLPU2	*Clarkia purpurea*	0.5	0.1	0.2	0.2
	CIVU	*Cirsium vulgare*	0.5	0.1	0.2	0.2
	BRTEK	*Brodiaea terrestris* subsp. *kernensis*	0.5	0.1	0.2	0.2
	ASFA	*Asclepias fascicularis*	0.5	0.1	0.2	0.2
	CITI	*Cirsium tioganum*	0.5	0.1	0.2	0.2
	RUMEX	*Rumex*	0.5	0.1	0.2	0.2
	ERCI6	*Erodium cicutarium*	0.5	0.1	0.2	0.2
	SOOL	*Sonchus (oleraceus)*	0.5	0.1	0.2	0.2

***Anemopsis californica* Alliance (Yerba Mansa)**

ASSOCIATIONS
Anemopsis californica-Juncus mexicanus

LOCAL VEGETATION DESCRIPTION
Stands of *Anemopsis californica* form an intermittent to continuous herbaceous layer (50-95%, mean 72%) at 0-0.5m tall, where *Anemopsis californica* dominates or co-dominates. The shrub layer is sparse (0-7%, mean 1.7%) at 0-0.5m tall. Trees occasionally occur as emergents (0-10% cover, mean 10%). Total vegetation cover is 50-95%, mean 72.5%.

In the *Anemopsis californica-Juncus mexicanus* Association, *Anemopsis californica* usually is co-dominant with *Juncus mexicanus.* A variety of other riparian or wetland species frequently occur, including *Ambrosia psilostachya, Medicago polymorpha, Erodium cicutarium, Leymus triticoides, Lolium multiflorum, Mentha* sp., *Rumex crispus,* and *Cirsium occidentale*. The shrub *Isocoma menziesii* is often present at low cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 272-2807 ft, mean 2259.8 ft
Aspect: often flat/none, otherwise variable
Slope: flat to gentle, range 0-2 degrees, mean 1.0 degrees
Topography: often flat, sometimes convex; bottom
Litter Cover: range 10-95%, mean 38.3%
Rock Cover: range 0-0, mean 0%
Bare Ground: range 0.2-13%, mean 8.4%
Parent Material: often metamorphic, occasionally Mesozoic granite
Soil Texture: medium to very fine sandy loam, medium silt loam

This alliance occurs in saturated wetlands adjacent to stream channels in the Western Granitic Foothills (M262Bn) Subsection from the Lake Hodges area east to Santa Ysabel Ranch.

Samples used to describe alliance: (n=6) SDRP0032, SDRP0033, SDRP0034, SDRP0243, SFVW129, SFVW130

RANK: G4 S2

GLOBAL DISTRIBUTION
Alliance: Peninsular Ranges (including W Riverside County: Santa Ana Mountains, San Diego County: western foothills), though full distribution is not known (potentially found in the South Coast, north to Central Coast, east to the Mojave Desert, and beyond California)

Anemopsis californica-Juncus mexicanus Association: Peninsular Ranges (including San Diego County: western foothills), though full distribution is not known

REFERENCES
Klein and Evens 2005, UCB 2004

***Anemopsis californica* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Shrub						
	ISME5	*Isocoma menziesii*	0.5	1.2	0.2	7
Herbaceous						
	ANCA10	*Anemopsis californica*	1	30.3	10	65
	JUME4	*Juncus mexicanus*	0.8	21.0	1	50
	RUCR	*Rumex crispus*	0.7	0.6	0.2	3
	AMPS	*Ambrosia psilostachya*	0.5	3.5	2	12
	MEPO3	*Medicago polymorpha*	0.5	2.4	0.2	9
	CIOC	*Cirsium occidentale*	0.5	0.5	0.2	2
	LETR5	*Leymus triticoides*	0.3	2.5	3	12
	CAREX	*Carex* (*praegracilis)*	0.3	1.2	1	6
	CYDA	*Cynodon dactylon*	0.3	0.4	0.2	2
	ERCI6	*Erodium cicutarium*	0.3	0.4	0.2	2
	LOMU	*Lolium multiflorum*	0.3	0.4	0.2	2
	DISP	*Distichlis spicata*	0.3	0.2	0.2	1
	LASE	*Lactuca serriola*	0.3	0.2	0.2	1
	MENTH	*Mentha (spicata)*	0.3	0.2	0.2	1
	SPAI	*Sporobolus airoides*	0.3	0.2	0.2	1

***Aristida purpurea* Alliance (Purple Three-awn)**

ASSOCIATIONS
Aristida purpurea

LOCAL VEGETATION DESCRIPTION
Stands of *Aristida purpurea* form an open to intermittent herbaceous layer (25-72%, mean 51.5%) at 0-0.5m tall, where *Aristida purpurea* is characteristic with a variety of native and non-native species in grasslands. The shrub layer is sparse (0-0.2%, mean 0.1%) at 0.5-2m tall, and the tree layer is also sparse (0-0.2%, mean 0.2%) at 5-10m tall. Total vegetation cover is 25-38%, mean 31.5%.

In the *Aristida purpurea* Alliance, *Aristida purpurea* is an indicator species and may be the most abundant species. However, the herbaceous layer is usually diverse, and non-native species may be prevalent in the understory, including *Erodium* spp. and *Bromus madritensis*. Other native species may also be abundant, including *Lessingia filaginifolia, Sisyrinchium bellum, Nassella pulchra,* and *Calochortus superbus.* The shrub layer is trace in cover and may include *Eriogonum fasciculatum, Gutierrezia sarothrae,* or *Yucca whipplei.*

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 2552-4174 ft, mean 3080 ft
Aspect: often flat, sometimes SW or NE
Slope: flat to moderate, range 0-8 degrees, mean 4.7 degrees
Topography: flat or undulating, bottom or ridge top
Litter Cover: 50% (one survey)
Rock Cover: 5% (one survey)
Bare Ground: 42% (one survey)
Parent Material: alluvium or other deposits or mixed granitic and metamorphic
Soil Texture: medium to very fine sandy loam or coarse sandy loam

The *Aristida purpurea* Alliance was sampled in the Palomar - Cuyamaca Peak (M262Bo) and Desert Slopes (M262Bp) Subsections, including the Santa Ysabel Ranch and San Felipe Valley areas. They occurred on dry, exposed flats and gentle slopes. These stands are impacted by weed invasions and grazing.

Samples used to describe alliance: (n=4) SDRP0017, SDRP0117, SFVW038, SFVW109

RANK: G3 S3?

GLOBAL DISTRIBUTION
Alliance and *Aristida purpurea* Association: southern Peninsular Ranges to Colorado Desert slopes (including San Diego County: Palomar - Cuyamaca Peak and San Felipe Valley regions). Full distribution is not known. This is the first time this alliance has been described and as far as is known it is restricted to San Diego County in the Peninsular Ranges and adjacent Desert Slopes, but it occurs potentially east to the Mojave Desert, and beyond California

REFERENCES
Moran 2004, UCB 2004

***Aristida purpurea* Alliance**

Stratum	Code	Species	Freq	Avg	Min	Max
Tree Overstory						
	QUAG-t	*Quercus agrifolia*	0.25	0.1	0.2	0.2
Shrub						
	ERFA2	*Eriogonum fasciculatum*	0.75	0.2	0.2	0.2
	ATRIP	*Atriplex*	0.25	0.1	0.2	0.2
	GUSA2	*Gutierrezia sarothrae*	0.25	0.1	0.2	0.2
	OPPH	*Opuntia phaeacantha*	0.25	0.1	0.2	0.2
	YUWH	*Yucca whipplei*	0.25	0.1	0.2	0.2
Herbaceous						
	BRMA3	*Bromus madritensis*	1	10.8	1	20
	ARPU9	*Aristida purpurea*	1	4.8	2	10
	LEFI11	*Lessingia filaginifolia*	0.75	0.4	0.2	1
	ERODI	*Erodium (brachycarpum, botrys, and moschatum)*	0.5	21.3	30	55
	ERCI6	*Erodium cicutarium*	0.5	5.0	10	10
	ERODI	*Erodium brachycarpum*	0.5	2.8	1	10
	LUBI	*Lupinus bicolor*	0.5	1.3	1	4
	AVBA	*Avena barbata*	0.5	0.6	0.2	2
	SIBE	*Sisyrinchium bellum*	0.25	2.0	8	8
	NAPU4	*Nassella pulchra*	0.25	1.3	5	5
	CASU3	*Calochortus superbus*	0.25	0.8	3	3
	ERSE3	*Eremocarpus setigerus*	0.25	0.5	2	2
	TRIFO	*Trifolium*	0.25	0.5	2	2
	AMPS	*Ambrosia psilostachya*	0.25	0.3	1	1
	CRIN8	*Cryptantha intermedia*	0.25	0.3	1	1
	LOST4	*Lotus strigosus*	0.25	0.3	1	1
	MICRO6	*Microseris*	0.25	0.3	1	1
	PLAR	*Plagiobothrys arizonicus*	0.25	0.3	1	1
	SABI3	*Sanicula bipinnatifida*	0.25	0.3	1	1
	ARDI5	*Aristida divaricata*	0.25	0.1	0.2	0.2
	ASER2	*Asclepias erosa*	0.25	0.1	0.2	0.2
	BRHO2	*Bromus hordeaceus*	0.25	0.1	0.2	0.2
	CACI2	*Calandrinia ciliata*	0.25	0.1	0.2	0.2
	CHAL11	*Chamaesyce albomarginata*	0.25	0.1	0.2	0.2
	ERGR5	*Eriogonum gracile*	0.25	0.1	0.2	0.2
	ESCA2	*Eschscholzia californica*	0.25	0.1	0.2	0.2
	FIGA	*Filago gallica*	0.25	0.1	0.2	0.2
	MICA	*Micropus californicus*	0.25	0.1	0.2	0.2
	MIDO3	*Minuartia douglasii*	0.25	0.1	0.2	0.2
	PLER3	*Plantago erecta*	0.25	0.1	0.2	0.2
	SOCA5	*Solidago californica*	0.25	0.1	0.2	0.2
	WYOV	*Wyethia ovata*	0.25	0.1	0.2	0.2

***Arundo donax* Alliance (Giant Reed)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
A stand of *Arundo donax* forms a continuous herbaceous layer (68%) at 2-5m tall, where *Arundo donax* dominates. The shrub layer is sparse (5%) at 0-2m tall. Trees occur as emergents in open cover (7%) at 10-15m tall, including *Salix* spp. Total vegetation cover is 77%.

In the *Arundo donax* Alliance, the herb layer is dominated by the non-native hydrophilic species *Arundo donax,* while native species are found low in cover, including *Ambrosia psilostachya* and *Scirpus* sp. Also, *Salix laevigata* and *Quercus agrifolia* are found emergent in the tree layer while *Carpobrotus edulis* and *Baccharis salicifolia* are found in the shrub layer at low cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 332 ft
Aspect: NW
Slope: gentle, 1 degree
Topography: concave, bottom
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: Mesozoic granite
Soil Texture: coarse sand

The *Arundo donax* Alliance was sampled in the Western Granitic Foothills (M262Bn) Subsection, including riparian corridors of Santa Ysabel Creek and San Dieguito River. This is a dangerously invasive non-native alliance that is easily spread along active stream channels during flooding events when the underground stolon and rootstalks are damaged, uprooted and transported by water to new locations. It also has been found to proliferate after fire in riparian settings within southern California.

Samples used to describe alliance: (n=1) SDRP0198

RANK: none, invasive

GLOBAL DISTRIBUTION
Alliance: outer North Coast, Central Coast, Central Valley (including Suisun Marsh), Sierra Nevada foothills, Transverse Ranges, South Coast and Peninsular Ranges (including W Riverside and San Diego Counties), Mojave Desert, Colorado Desert; native to Europe

REFERENCES
Bossard et al. 2000, CDFG 2000, CNPS and CDFG 2005b, Kisner 2004, Klein and Evens 2005, Sawyer and Keeler-Wolf 1995, Zembal 1989

***Arundo donax* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	SALA3-t	*Salix laevigata*	1	7	7	7
Tree Understory						
	QUAG-m	*Quercus agrifolia*	1	2	2	2
Shrub						
	CAED3	*Carpobrotus edulis*	1	5	5	5
	BASA4	*Baccharis salicifolia*	1	2	2	2
	RUUR	*Rubus ursinus*	1	2	2	2
	MEAL2	*Melilotus albus*	1	0.2	0.2	0.2
Herbaceous						
	ARDO4	*Arundo donax*	1	65	65	65
	VIMA	*Vinca major*	1	2	2	2
	AMPS	*Ambrosia psilostachya*	1	2	2	2
	SCIRP	*Scirpus*	1	1	1	1
	URDI	*Urtica dioica*	1	0.2	0.2	0.2
	PHLEU	*Phleum*	1	0.2	0.2	0.2
	EPILO	*Epilobium ciliatum*	1	0.2	0.2	0.2
	ARDO3	*Artemisia douglasiana*	1	0.2	0.2	0.2
	RUCR	*Rumex crispus*	1	0.2	0.2	0.2
	OEEL	*Oenothera elata*	1	0.2	0.2	0.2
	EPILO	*Epilobium*	1	0.2	0.2	0.2

California Annual Grassland Alliance

ASSOCIATIONS
Bromus diandrus-Mixed Herb
Bromus madritensis-Mixed Herb
Bromus tectorum

LOCAL VEGETATION DESCRIPTION
Stands of California Annual Grassland form an open to continuous herbaceous layer (15-95%, mean 63.9%) at 0-1m tall, where annual grasses dominate. The shrub layer, when present, is sparse (0-6%, mean 1.7%) at 0-5m tall. Trees infrequently occur as emergents (0.4-3%, mean 1.7%). Total vegetation cover is 17-95%, mean 64.1%.

In the *Bromus diandrus*-Mixed Herb sub-alliance, *Bromus diandrus* is usually dominant or co-dominant with other non-native grass species. *B. hordeaceus* and *Avena barbata* are often co-dominants. *Erodium* species are often found in this association. Native species may include *Ambrosia psilostachya, Elymus glaucus, Eremocarpus setigerus, Lessingia filaginifolia, Lotus* spp., *Lupinus bicolor,* and *Trichostema lanceolatum*.

In the *Bromus madritensis*-Mixed Herb sub-alliance, *B. madritensis*, *Erodium* spp. and *Eremocarpus setigerus* are dominant among a variety of other non-native and native herbaceous species such as *Avena barbata, B. hordeaceus, Cucurbita palmata, Datura wrightii,* and *Lessingia filaginifolia*.

In the *Bromus tectorum* sub-alliance, *Bromus tectorum* is dominant, though other grasses or forbs may be sub-dominant such as *B. diandrus* or *Erodium* sp. Native species may include *Claytonia perfoliata, Lupinus bicolor, Lotus strigosus,* and *Trifolium* sp. Note: *Bromus tectorum* has been considered its own alliance in other treatments, separate from the other types in California Annual Grassland by climatic regime (found primarily in cool montane or desert climates).

Additional inventory of annual grassland sites is needed to better represent the native herb biodiversity, which can be intermixed with non-native grasses.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 322-5155 ft, mean 2805 ft
Aspect: variable but more often SW
Slope: flat to somewhat steep, range 0-23 degrees, mean 6.9 degrees
Topography: variable but more often undulating; bottom to upper slope
Litter Cover: range 1-94%, mean 24.7%
Rock Cover: range 0-38%, mean 7.1%
Bare Ground: range 0.2-95%, mean 43.8%
Parent Material: more often mixed granitic and metamorphic, occasionally alluvium and other deposits, Mesozoic granite, metamorphic or schist
Soil Texture: more often medium to very fine sandy loam, occasionally moderately fine sandy clay loam, medium to very fine loamy sand, fine silty clay, coarse loamy sand or coarse loamy sand

The California Annual Grassland Alliance was sampled in all but one subsection: Coastal Hills (261Bi), Western Granitic Foothills (M262Bn), Palomar - Cuyamaca Peak (M262Bo), and Desert Slopes (M262Bp). It occurs on flats to exposed steep slopes with variable topography. This type needs to be better studied to see if grazing has a beneficial impact on reducing annual non-native plant invasion. Further, this type may be exceedingly stimulated by frequent fires and also by air pollution adjacent to development, especially near the urban-wildland interface in coastal sage scrub habitats.

Samples used to describe alliance: (n=32) SDRP0003, SDRP0007, SDRP0031, SDRP0045, SDRP0068, SDRP0092, SDRP0105, SDRP0122, SDRP0146, SDRP0184, SDRP0205, SDRP0226, SDRP0237, SDRP0462, SDRP0483, SFVW015, SFVW019, SFVW022, SFVW025, SFVW034, SFVW042, SFVW043, SFVW052, SFVW057, SFVW083, SFVW108, SFVW113, SFVW121, SFVW122, SFVW123, SFVW145, SFVW146

RANK: G1 S1 to G4 S4 (depending on association)

GLOBAL DISTRIBUTION
Alliance: widely distributed in Cismontane California and Transmontane California; Baja California (to intermountain west)

Bromus diandrus-Mixed Herb and *Bromus madritensis*-Mixed herb sub-alliances: South Coast and Peninsular Ranges (including W Riverside and San Diego Counties) and Colorado Desert (San Diego County), though full distribution is not known

Bromus tectorum sub-alliance: Cismontane California and Transmontane California; intermountain West

REFERENCES
Boyd et al. 1995, CDFG 2000, CNPS and CDFG 2005a, CNPS and CDFG 2005b, Evens and San 2004, Jimerson et al. 2000, Keeler-Wolf 1990, Keeley 1989, Klein and Evens 2005, NatureServe et al. 2003a, NatureServe et al. 2003b, Potter 2003, Sawyer and Keeler-Wolf 1995, Shuford and Timossi 1989, Vogl 1976

California Annual Grassland Alliance

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	ERFA2	*Eriogonum fasciculatum*	0.2	0.2	0.2	2
Herbaceous						
	BRHO2	*Bromus hordeaceus*	0.9	3.4	0.2	20
	BRDI3	*Bromus diandrus*	0.8	30.4	2	85
	AVBA	*Avena barbata*	0.7	7.8	0.2	50
	ERODI	*Erodium (brachycarpum, moschatum,* and *botrys)*	0.7	16.2	0.2	55
	AMPS	*Ambrosia psilostachya*	0.6	0.5	0.2	2
	ERSE3	*Eremocarpus setigerus*	0.5	1	0.2	6
	ERCI6	*Erodium cicutarium*	0.5	3.4	0.2	20
	BRMA3	*Bromus madritensis*	0.5	3	0.2	25
	HIIN3	*Hirschfeldia incana*	0.3	0.4	0.2	5
	NAPU4	*Nassella pulchra*	0.3	0.1	0.2	1
	BRTE	*Bromus tectorum*	0.2	6.4	1	75
	VUMY	*Vulpia myuros*	0.2	0.4	0.2	6
	LOHA2	*Lotus hamatus*	0.2	0.3	0.2	4
	BRASS2	*Brassica*	0.2	0.2	0.2	2

Disturbed Temporarily to Seasonally Flooded Grasslands & Forbs

ASSOCIATIONS
None, general habitat type only

LOCAL VEGETATION DESCRIPTION
Stands of Disturbed Temporarily to Seasonally Flooded Grasslands & Forbs form a continuous herbaceous layer (98-99%, mean 98.5%) at 0-1m tall, where disturbance tolerant grasses and forbs dominate. Trees occasionally occur as emergents (0.2-0% cover, mean 0.2%). Total vegetation cover is 99%, mean 99%.

In the Disturbed Temporarily to Seasonally Flooded Grasslands & Forbs type, there may be a variety of non-native and native species. For example, *Conium maculatum, Pluchea odorata,* or *Alopecurus saccatus* may be dominant. *Cyperus* spp*., Amaranthus albus,* and *Echinochloa crus-galli* may also abundant.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 274-375 ft, mean 325 ft
Aspect: flat or NW
Slope: flat to gentle range 0-3 degrees, mean 1.5 degrees
Topography: flat, bottom to lower slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: no data
Soil Texture: coarse sand

Stands of Disturbed Temporarily to Seasonally Flooded Grasslands & Forbs occurred in the Coastal Hills (261Bi) Subsection of the study area, particularly along the margins of Lake Hodges.

Samples used to describe alliance: (n=2) SDRP0079, SDRP0260

RANK: G3 S3?

GLOBAL DISTRIBUTION
This is a regionally defined unit, so no distribution is provided

REFERENCES
No references

Disturbed Temporarily to Seasonally Flooded Grasslands & Forbs

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	POFR2-t	*Populus fremontii*	0.5	0.1	0.2	0.2
Tree Understory						
	SAGO-m	*Salix gooddingii*	0.5	1.5	3	3
Shrub						
	TAMAR2	*Tamarix*	0.5	1	2	2
	BASA4	*Baccharis salicifolia*	0.5	0.1	0.2	0.2
Herbaceous						
	COMA2	*Conium maculatum*	0.5	49	98	98
	CYPER	*Cyperus (odoratus)*	0.5	21	42	42
	CYPER	*Cyperus erythrorhizos*	0.5	21	42	42
	ALSA3	*Alopecurus saccatus*	0.5	17.5	35	35
	ECCR	*Echinochloa crus-galli*	0.5	7.5	15	15
	AMAL	*Amaranthus albus*	0.5	5	10	10
	CHRU	*Chenopodium rubrum*	0.5	0.5	1	1
	PACA6	*Panicum capillare*	0.5	0.5	1	1
	GNLU	*Gnaphalium luteoalbum*	0.5	0.1	0.2	0.2

***Juncus balticus-Juncus mexicanus* Alliance (Baltic Rush - Mexican Rush)**

ASSOCIATIONS
Juncus mexicanus

LOCAL VEGETATION DESCRIPTION
Stands of *Juncus mexicanus* form an intermittent to continuous herbaceous layer (50-95%, mean 70%) at 0-0.5m tall, where *Juncus mexicanus* dominates. The shrub layer, when present, is sparse to open (0-12%, mean 5.1%) at 0-2m tall. Trees occasionally occur as emergents (0.2-4% cover, mean 2.1%) at 5-10m tall. Total vegetation cover is 60-95%, mean 75%.

In the *Juncus mexicanus* Association*, Juncus mexicanus* dominates. Other graminoids and forbs may be present in low cover, including *Bromus diandrus, Poa pratensis, Ambrosia psilostachya,* and *Bromus hordeaceus*. Emergent trees and shrubs may also be present, such as *Salix gooddingii*, *S. laevigata, S. lasiolepis, Tamarix* sp.*,* etc.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 917-5223 ft, mean 3494 ft
Aspect: often SW, occasionally SE
Slope: gentle, 2 degrees, mean 2 degrees (for four plots)
Topography: more often concave, occasionally undulating or flat
Litter Cover: range 46.6-47%, mean 46.6%
Rock Cover: 8%, mean 8% (for one plot)
Bare Ground: 40%, mean 40% (for one plot)
Parent Material: often mixed granitic and metamorphic, occasionally Mesozoic granite
Soil Texture: medium silt loam (for one plot)

The *Juncus balticus-Juncus mexicanus* Alliance was sampled in the Western Granitic Foothills (M262Bn) and Palomar - Cuyamaca Peak (M262Bo) Subsections. It is found along riparian corridors of Pamo Valley and Santa Ysabel Ranch area and saturated meadows on Volcan Mountain.

Samples used to describe alliance: (n=4) SDRP0009, SDRP0013, SDRP0223, SDRP0355

RANK: G4 S4?

GLOBAL DISTRIBUTION
Alliance: California. Full distribution is not known but includes Central Valley (including Suisun Marsh), Sierra Nevada, south to the Peninsular Ranges and the Mojave and Colorado Deserts (including Anza-Borrego Desert) in California; east to Nevada

Juncus mexicanus Association: southern Peninsular Range (including San Diego County: Palomar - Cuyamaca Peak and western foothills), though full distribution is not known but likely similar to alliance

REFERENCES
CDFG 1998, CDFG 2000, Manning and Padget 1995, Moran 2004, NatureServe 2004, Thomas et al. 2004

***Juncus balticus-Juncus mexicanus* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	SAGO-t	*Salix gooddingii*	0.3	0.3	1	1
	SALA3-t	*Salix laevigata*	0.3	0.3	1	1
Tree Understory						
	AIAL	*Ailanthus altissima*	0.3	0.5	2	2
Shrub						
	TAMAR2	*Tamarix*	0.5	0.1	0.2	0.2
	SALA6-l	*Salix lasiolepis*	0.3	2	8	8
	BASA4	*Baccharis salicifolia*	0.3	1.3	5	5
	SALA6-m	*Salix lasiolepis*	0.3	0.5	2	2
Herbaceous						
	JUME4	*Juncus mexicanus*	1	38.8	20	50
	BRDI3	*Bromus diandrus*	0.8	6.6	0.2	25
	POPR	*Poa pratensis*	0.8	5.6	0.2	20
	AMPS	*Ambrosia psilostachya*	0.8	3	2	5
	BRHO2	*Bromus hordeaceus*	0.8	1.4	0.2	5
	CAPR5	*Carex praegracilis*	0.5	15	10	50
	JUEFP	*Juncus effusus* var. *pacificus*	0.5	6.8	7	20
	MEPO3	*Medicago polymorpha*	0.5	3.8	0.2	15
	SIMAS	*Sidalcea malviflora* subsp. *sparsifolia*	0.5	0.3	0.2	1
	AVBA	*Avena barbata*	0.5	0.1	0.2	0.2
	RUMEX	*Rumex*	0.5	0.1	0.2	0.2
	VUMY	*Vulpia myuros*	0.5	0.1	0.2	0.2
	EPILO	*Epilobium ciliatum*	0.5	0.1	0.2	0.2
	EPILO	*Epilobium*	0.5	0.1	0.2	0.2
	POMO5	*Polypogon monspeliensis*	0.5	0.1	0.2	0.2
	CITI	*Cirsium tioganum*	0.5	0.1	0.2	0.2
	LASE	*Lactuca serriola*	0.5	0.1	0.2	0.2
	MIGU	*Mimulus guttatus*	0.5	0.1	0.2	0.2
	HOBR2	*Hordeum brachyantherum*	0.3	5	20	20
	ELEOC	*Eleocharis parishii*	0.3	3.8	15	15
	ELEOC	*Eleocharis*	0.3	3.8	15	15
	TAOF	*Taraxacum officinale*	0.3	3.8	15	15
	ELEOC	*Eleocharis macrostachya*	0.3	3.8	15	15
	ASCH2	*Aster chilensis*	0.3	1.8	7	7
	URDI	*Urtica dioica*	0.3	0.5	2	2
	ANCA10	*Anemopsis californica*	0.3	0.5	2	2
	RACA2	*Ranunculus californicus*	0.3	0.5	2	2
	LUBI	*Lupinus bicolor*	0.3	0.5	2	2
	BRMI2	*Briza minor*	0.3	0.3	1	1

***Juncus balticus-Juncus mexicanus* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
	RONA2	*Rorippa (nasturtium-aquaticum)*	0.3	0.3	1	1
	RONA2	*Rorippa nasturtium-aquaticum*	0.3	0.3	1	1
	DISP	*Distichlis spicata*	0.3	0.3	1	1
	EQHY	*Equisetum hyemale*	0.3	0.3	1	1
	GNAPH	*Gnaphalium*	0.3	0.3	1	1
	GNAPH	*Gnaphalium (ramosissimum)*	0.3	0.3	1	1
	GNPA	*Gnaphalium palustre*	0.3	0.3	1	1
	JUBU	*Juncus bufonius*	0.3	0.3	1	1

***Juncus effusus* Alliance (Common Rush)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
A stand of *Juncus effusus* forms an intermittent herbaceous layer (50%), where *Juncus effusus* dominates or co-dominates. The shrub layer is sparse (0.2%). Trees occur as sparse emergents (2% cover). Total vegetation cover is 50%.

In one sample in the *Juncus effusus* Alliance, *Juncus effusus* var. *pacificus* (Pacific rush) was dominant with *Urtica dioica*, while *Juncus mexicanus* and *Typha latifolia* are present in low cover. *Calocedrus decurrens* or *Salix* spp. are found as emergent trees.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: mid, 4934 ft
Aspect: NW
Slope: gentle, 2 degrees
Topography: convex, bottom
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: mixed granitic and metamorphic
Soil Texture: no data

The *Juncus effusus* Alliance was sampled only within the Palomar - Cuyamaca Peak (M262Bo) Subsection. Its distribution includes the Santa Ysabel Ranch area and east to Volcan Mountain, particularly as small stands within artificially created stock ponds, riparian features, minor depressions, and wet meadows/seeps.

Samples used to describe alliance: (n=1) SDRP0203

RANK: G4 S4?

GLOBAL DISTRIBUTION
Pacific Northwest from British Columbia south to California; to eastern United States (including the southeastern states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia), and elsewhere. The full distribution in North America is not known

REFERENCES
CNPS and CDFG 2005b, Moran 2004, NatureServe 2004, NatureServe et al. 2003a

***Juncus effusus* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	CADE27-t	*Calocedrus decurrens*	1	1	1	1
Tree Understory						
	SALA6-t	*Salix lasiolepis*	1	0.2	0.2	0.2
Shrub						
	SAME5	*Sambucus mexicana*	1	0.2	0.2	0.2
	RHCA	*Rhamnus californica*	1	0.2	0.2	0.2
Herbaceous						
	JUEFP	*Juncus effusus* var. *pacificus*	1	28	28	28
	URDI	*Urtica dioica*	1	20	20	20
	JUME4	*Juncus mexicanus*	1	2	2	2
	TYLA	*Typha latifolia*	1	1	1	1
	CIVU	*Cirsium vulgare*	1	0.2	0.2	0.2
	CAREX	*Carex (praegracilis)*	1	0.2	0.2	0.2
	CAREX	*Carex*	1	0.2	0.2	0.2
	EPILO	*Epilobium*	1	0.2	0.2	0.2
	LASE	*Lactuca serriola*	1	0.2	0.2	0.2
	EPILO	*Epilobium ciliatum*	1	0.2	0.2	0.2
	PIEC	*Picris echioides*	1	0.2	0.2	0.2
	BRTE	*Bromus tectorum*	1	0.2	0.2	0.2

***Lepidium latifolium* Alliance (Perennial Pepperweed)**

ASSOCIATIONS
None, alliance only

LOCAL VEGETATION DESCRIPTION
Reconnaissance of riparian stands show *Lepidium latifolium* Forbland forms an intermittent to continuous herbaceous layer at 0.5-1m tall, where *Lepidium latifolium* dominates. The shrub layer is relatively open, and may include species such as *Baccharis salicifolia* and *Sambucus mexicana*. The tree layer is also open and may include *Salix gooddingii*.

These stands are made up primarily of *Lepidium latifolium*, which is a dangerously invasive non-native weed.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 250-350 ft
Aspect: flat
Slope: flat, 0 degrees
Topography: flat; bottom slope
Litter Cover: no data
Rock Cover: no data
Bare Ground: no data
Parent Material: alluvium
Soil Texture: no data

The *Lepidium latifolium* Alliance was sampled intermittently and seasonally flooded habitats in the Western Granitic Foothills (M262Bn) Subsection, especially in riparian corridors feeding into Lake Hodges.

Samples used to describe alliance: none (in brief reconnaissance surveys only)

RANK: none, invasive

GLOBAL DISTRIBUTION
Alliance: Central Valley (including Solano County: Suisun Marsh), Transverse Ranges (including Santa Monica Mountains), South Coast and Peninsular Ranges (including Western Riverside County: Fontana Plain – Calimesa Terraces Subsection; San Diego County: western foothills), though full distribution is not known. According to the NRCS PLANTS database (USDA 2004), it has been listed as a State Noxious Weed for 43 states.

REFERENCES
Bossard et al. 2000, CDFG 2000, CNPS and CDFG 2005b

***Nassella pulchra* Alliance (Purple Needlegrass)**

ASSOCIATIONS
Nassella pulchra-Erodium spp.*-Avena barbata*

LOCAL VEGETATION DESCRIPTION
Stands of *Nassella pulchra* form an open to intermittent herbaceous layer (30-50%, mean 40%) at 0-1m tall, where *Nassella pulchra* dominates or co-dominates. The shrub layer, when present, is sparse (0.2%, mean 0.2%) at 0-0.5m tall. Total vegetation cover is 30-50%, mean 40%.

In the *Nassella pulchra-Erodium* spp.*-Avena barbata* Association, the herbaceous layer includes a variety of native and non-native species. Native *Nassella pulchra* is co-dominant or sub-co-dominant with non-natives *Erodium* spp. and *Avena barbata*. Occasionally, shrubs such as *Eriogonum fasciculatum* may also be present in low cover.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 172-3188 ft, mean 1744 ft
Aspect: often NW, occasionally SW
Slope: gentle to moderate, range 2-14 degrees, mean 6.8 degrees
Topography: more often undulating, occasionally concave or flat
Litter Cover: 80%, mean 80% (for one plot)
Rock Cover: 0.4%, mean 0.4% (for one plot)
Bare Ground: 5%, mean 5% (for one plot)
Parent Material: more often metamorphic, occasionally sandstone or Metavolcanic
Soil Texture: moderately fine sandy clay loam or fine sandy clay

The *Nassella pulchra* Alliance was sampled from the coastal hills to foothills in the Coastal Hills (261Bi) and Western Granitic Foothills (M262Bn) Subsections. It was found on flats and low slopes in the Lusardi Creek drainage and in the Santa Ysabel Ranch.

Samples used to describe alliance: (n=4) SDRP0030, SDRP0036, SDRP0094, SDRP0357

RANK: G3 S3

GLOBAL DISTRIBUTION
Alliance: North and Central Coast (including Marin and Santa Clara Counties), Sacramento Valley, Sierra Nevada foothills, South Coast, low-elevation Transverse Ranges (including Santa Monica Mountains, Peninsular Ranges (including W Riverside and San Diego Counties), western Mojave Desert, Baja California

Nassella pulchra-Erodium spp.*-Avena barbata* Association: South Coast and Peninsular Ranges (including San Diego: coastal terraces and western foothills; W Riverside County: Santa Ana Mountains), though full distribution is not known

REFERENCES
Boyd et al. 1995, CNPS and CDFG 2005b, Feidler and Leidy 1987, Holland 1986, Keeley 1989, Klein and Evens 2005, NatureServe et al. 2003a, Sawyer and Keeler-Wolf 1995

***Nassella pulchra* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	ERFA2	*Eriogonum fasciculatum*	0.5	0.1	0.2	0.2
	GUSA2	*Gutierrezia sarothrae*	0.3	1	4	4
Herbaceous						
	NAPU4	*Nassella pulchra*	1	14.3	2	33
	ERODI	*Erodium (brachycarpum, moschatum,* and *botrys)*	1	10	1	28
	AVBA	*Avena barbata*	0.8	4.8	2	12
	BRHO2	*Bromus hordeaceus*	0.8	1.3	1	3
	SIBE	*Sisyrinchium bellum*	0.8	0.2	0.2	0.2
	BROMU	*Bromus*	0.5	1.5	1	5
	BRASS2	*Brassica*	0.5	1.5	1	5
	BRMA3	*Bromus madritensis*	0.5	0.8	1	2
	BRDI3	*Bromus diandrus*	0.5	0.5	1	1
	AMPS	*Ambrosia psilostachya*	0.5	0.1	0.2	0.2
	ERSE3	*Eremocarpus setigerus*	0.5	0.1	0.2	0.2
	CYCA	*Cynara cardunculus*	0.5	0.1	0.2	0.2
	FIGA	*Filago gallica*	0.5	0.1	0.2	0.2
	TRLA4	*Trichostema lanceolatum*	0.5	0.1	0.2	0.2
	BRDI2	*Brachypodium distachyon*	0.3	5	20	20
	AVFA	*Avena fatua*	0.3	4.3	17	17
	WYOV	*Wyethia ovata*	0.3	0.3	1	1

***Scirpus californicus - Scirpus acutus* Alliance (California Bulrush - Hardstem Bulrush)**

ASSOCIATIONS
Scirpus californicus-S. acutus
Scirpus (*californicus* and/or *acutus*)-*Typha*

LOCAL VEGETATION DESCRIPTION
Stands of *Scirpus californicus- Scirpus acutus* Alliance form an intermittent to continuous herbaceous layer (45-75%, mean 60%) at 1-2m tall. *Scirpus californicus* and/or the ecologically equivalent *S. acutus* is dominant, or they may co-dominate with *Typha* spp. *Typha* spp. may occur in higher cover than the *Scirpus* spp., but *S. californicus* or *S. acutus* is always at least 20% relative cover. The shrub layer, if present, is sparse to open (0-15%, mean 7.5%) at 1-5m tall. Trees, when present, occur as emergents (1% cover, mean 1%) at 5-10m tall. Total vegetation cover is 45-80%, mean 62.5%.

In one sample of the *Scirpus californicus-S. acutus* Association**,** *Scirpus acutus* is dominant in the herbaceous layer. Other herbs occur at low cover, including *Bromus* spp. Shrubs occur at low cover, including *Baccharis salicifolia, B. pilularis,* and *Isocoma menziesii*.

In one sample of the *Scirpus* (*californicus* and/or *acutus*)-*Typha* Association, *Scirpus californicus* is co-dominant with *Typha domingensis*. Other herbs include *Eleocharis* sp. and *Paspalum distichum.*

Scirpus californicus and *S. acutus* are combined in a mixed alliance currently (cf. CDFG 2000), because they are ecologically equivalent and intermingle in California (and across the United States).

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low to mid, range 336-5220 ft, mean 2778 ft
Aspect: SW or NE
Slope: gentle to somewhat steep, range 4-15 degrees, mean 9.5 degrees
Topography: convex or concave, bottom to lower slope
Litter Cover: range 67.7-68%, mean 67.7%
Rock Cover: range 17-17%, mean 17%
Bare Ground: range 10-10%, mean 10%
Parent Material: mixed granitic and metamorphic
Soil Texture: moderately coarse sandy loam

The *Scirpus californicus - Scirpus acutus* Alliance was sampled around saturated edges of lakes and ponds in the Coastal Hills (261Bi) and Palomar - Cuyamaca Peak (M262Bo) Subsections, including the Lake Hodges area and east to Volcan Mountain.

Samples used to describe alliance: (n=2) SDRP0224, SDRP0269

RANK: G1 S1, G2 S2, G3 S3 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Cismontane and Transmontane California, North America; known from across the northernwestern and northeastern United States (particularly *Scirpus acutus*) and eastern United States (particularly *Scirpus californicus)*

Scirpus californicus-S. acutus Association and *Scirpus* (*californicus* and/or *acutus*)-*Typha* Association: Central Valley (including Suisun Marsh) south to Peninsular Ranges (San Diego County), though full distribution is not known

REFERENCES
CDFG 2000, Ferren 1989, Klein and Evens 2005, NatureServe et al. 2003a

***Scirpus californicus - Scirpus acutus* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	SAGO-t	*Salix gooddingii*	0.5	0.1	0.2	0.2
Shrub						
	BAPI	*Baccharis pilularis*	0.5	4.5	9	9
	BASA4	*Baccharis salicifolia*	0.5	4	8	8
	ISME5	*Isocoma menziesii*	0.5	2.5	5	5
	TAMAR2	*Tamarix*	0.5	1	2	2
	OPLI3	*Opuntia littoralis*	0.5	0.1	0.2	0.2
Herbaceous						
	SCACO4	*Scirpus acutus* var. *occidentalis*	0.5	25	50	50
	TYDO	*Typha domingensis*	0.5	12.5	25	25
	ELEOC	*Eleocharis macrostachya*	0.5	10	20	20
	ELEOC	*Eleocharis*	0.5	10	20	20
	ELEOC	*Eleocharis parishii*	0.5	10	20	20
	SCCA	*Scirpus californicus*	0.5	5	10	10
	DISP	*Distichlis spicata*	0.5	2.5	5	5
	BRDI3	*Bromus diandrus*	0.5	2.5	5	5
	BRHO2	*Bromus hordeaceus*	0.5	1.5	3	3
	POMO5	*Polypogon monspeliensis*	0.5	1	2	2
	PADI6	*Paspalum distichum*	0.5	1	2	2
	CEME2	*Centaurea melitensis*	0.5	0.5	1	1
	AVENA	*Avena*	0.5	0.5	1	1
	AMPS	*Ambrosia psilostachya*	0.5	0.5	1	1
	BRASS2	*Brassica*	0.5	0.5	1	1
	JUME4	*Juncus mexicanus*	0.5	0.1	0.2	0.2
	XAST	*Xanthium strumarium*	0.5	0.1	0.2	0.2
	PONO2	*Potamogeton nodosus*	0.5	0.1	0.2	0.2
	GNLU	*Gnaphalium luteoalbum*	0.5	0.1	0.2	0.2
	ALPLB	*Alisma plantago-aquatica* subsp. *brevipes*	0.5	0.1	0.2	0.2

***Selaginella bigelovii* Alliance (Bigelow's Spike-moss)**

ASSOCIATIONS
Selaginella bigelovii-Eriogonum fasciculatum

LOCAL VEGETATION DESCRIPTION
A stand of *Selaginella bigelovii* forms an intermittent herbaceous layer (45%) at 0-0.5m tall, where *Selaginella bigelovii* dominates or co-dominates. The shrub layer is sparse (1%) at 0-0.5m tall. Total vegetation cover is 46%.

In one sample of the *Selaginella bigelovii-Eriogonum fasciculatum* Association, *Selaginella bigelovii* is dominant at cover more than 10% while *Eriogonum fasciculatum* is emergent in the shrub layer at cover less than 5%.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, 1595 ft
Aspect: SW
Slope: steep, 38 degrees
Topography: flat, middle to upper slope
Litter Cover: 40%
Rock Cover: 43%
Bare Ground: 12%
Parent Material: diorite or Mesozoic granite
Soil Texture: medium to very fine sandy loam

The *Selaginella bigelovii* Alliance was sampled only within the Western Granitic Foothills (M262Bn) Subsection on exposed south-facing, steep and rocky slopes in the Santa Ysabel Ranch area.

Samples used to describe alliance: (n=1) SDRP0293

RANK: G3 S3?

GLOBAL DISTRIBUTION
Alliance: South Coast and Peninsular Ranges (including coastal hills of Ventura and Los Angeles Counties south to the western foothills of San Diego County)

Selaginella bigelovii-Eriogonum fasciculatum Association: same as alliance

REFERENCES
CNPS and CDFG 2005b

***Selaginella bigelovii* Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Shrub						
	ERFA2	*Eriogonum fasciculatum*	1	1	1	1
	YUWH	*Yucca whipplei*	1	0.2	0.2	0.2
Herbaceous						
	DUED	*Dudleya edulis*	1	2	2	2
	BRMA3	*Bromus madritensis*	1	1	1	1
	AVBA	*Avena barbata*	1	0.2	0.2	0.2
	PHACE	*Phacelia*	1	0.2	0.2	0.2
Cryptogam						
	SEBI	*Selaginella bigelovii*	1	40	40	40
	MOSS	Moss	1	2	2	2

***Typha* spp. Alliance (Cattail)**

ASSOCIATIONS
Typha latifolia

LOCAL VEGETATION DESCRIPTION
Stands of *Typha* spp. form a continuous herbaceous layer (80-95%, mean 85%) at 2-10m tall, where *Typha latifolia* dominates. Trees, when present, occur as emergents (3% cover, mean 3%) at 5-10m tall. Total vegetation cover is 80-98%, mean 86%.

In the *Typha latifolia* Association, *Typha latifolia* is dominant. Other herbaceous species such as *Lepidium latifolium, Scirpus californicus* and *Cyperus* spp. are found in lower cover.

The National Vegetation Classification has a *Typha latifolia* Alliance recognized from Florida and a *Typha (angustifolia-latifolia) (-Scirpus)* Alliance (NatureServe 2004), though the California state classification currently recognizes a *Typha* spp. Alliance (Sawyer and Keeler-Wolf 1995). Since there is taxonomic confusion, we have taken a conservative stance in this local classification until further research is completed, placing all *Typha* dominated stands in a general alliance.

LOCAL ENVIRONMENTAL DESCRIPTION
Elevation: low, range 290-1120 ft, mean 660 ft
Aspect: variable
Slope: flat to somewhat steep, range 0-13 degrees, mean 5.0 degrees
Topography: flat or concave, bottom
Litter Cover: 90%, mean 90% (from one stand)
Rock Cover: no data
Bare Ground: 0.2%, mean 0.2% (from one stand)
Parent Material: Mesozoic granite, or alluvium and other deposits
Soil Texture: fine sandy clay to fine silty clay

The *Typha* spp. Alliance was sampled in wetland habitats in the Western Granitic Foothills (M262Bn) Subsection. It was found around Lake Hodges and east to Boden Canyon in saturated riparian corridors and along pond margins.

Samples used to describe alliance: (n=3) SDRP0055, SDRP0073, SDRP0241

RANK: G1 S1 to G5 S5 (depending on association)

GLOBAL DISTRIBUTION
Alliance: Cismontane and Transmontane California including the Central Valley (e.g., Suisun Marsh); to eastern North America and Canada

Typha latifolia Association: probably the same distribution as the alliance, including the western foothills of San Diego County

REFERENCES
CDFG 2000, CNPS and CDFG 2005b, NatureServe 2004, Sawyer and Keeler-Wolf 1995

***Typha* spp. Alliance**

Stratum	Code	Species Name	Freq	Avg	Min	Max
Tree Overstory						
	SAGO-t	*Salix gooddingii*	0.3	1	3	3
Herbaceous						
	TYLA	*Typha latifolia*	1	77.3	72	80
	LELA2	*Lepidium latifolium*	0.3	11.7	35	35
	SCCA	*Scirpus californicus*	0.3	1.3	4	4

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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.

Why do we need to know about the composition and distribution of vegetation?

- 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 shrublayer
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 2004).

Code	Scientific Name	Common Name	Family	Native
ABCO	*Abies concolor*	white fir	Pinaceae	Yes
ACCY2	*Acacia cyclops*	cyclops acacia	Fabaceae	No
ACGR	*Acacia greggii*	catclaw acacia	Fabaceae	Yes
ACLO	*Acacia longifolia*	Sydney golden wattle	Fabaceae	No
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
ADPO	*Adenophyllum porophylloides*	San Felipe dogweed	Asteraceae	Yes
ADFA	*Adenostoma fasciculatum*	chamise	Rosaceae	Yes
ADIAN	*Adiantum*	maidenhair fern	Pteridaceae	Yes
ADCA2	*Adolphia californica*	California adolphia	Rhamnaceae	Yes
AGDE	*Agave deserti*	desert agave	Agavaceae	Yes
AGROS2	*Agrostis*	bentgrass	Poaceae	Unknown
AGGI2	*Agrostis (gigantea)*	redtop	Poaceae	Unknown
AIAL	*Ailanthus altissima*	ailanthus	Simaroubaceae	No
ALPLA	*Alisma plantago-aquatica* var. *americanum*	northern water plantain	Alismataceae	Yes
ALRH2	*Alnus rhombifolia*	white alder	Betulaceae	Yes
ALSA3	*Alopecurus saccatus*	Pacific foxtail	Poaceae	Yes
AMAL	*Amaranthus albus*	pigweed amaranth	Amaranthaceae	No
AMBRO	*Ambrosia*	ragweed	Asteraceae	Yes
AMPS	*Ambrosia psilostachya*	western ragweed	Asteraceae	Yes
AMFR	*Amorpha fruticosa*	desert indigobush	Fabaceae	Yes
AMSIN	*Amsinckia*	fiddleneck	Boraginaceae	Yes
AMMEI2	*Amsinckia menziesii* var. *intermedia*	common fiddleneck	Boraginaceae	Yes
ANAR	*Anagallis arvensis*	pimpernel	Primulaceae	No
ANMA	*Anaphalis margaritacea*	pearly everlasting	Asteraceae	Yes
ANCA10	*Anemopsis californica*	yerba mansa	Saururaceae	Yes
ANCA14	*Anthriscus caucalis*	burr chervil	Apiaceae	No
ANCO4	*Antirrhinum coulterianum*	Coulter's snapdragon	Scrophulariaceae	Yes
ANNU3	*Antirrhinum nuttallianum*	violet snapdragon	Scrophulariaceae	Yes
APGR2	*Apium graveolens*	celery	Apiaceae	No
ARABI2	*Arabis*	rockcress	Brassicaceae	Yes
ARSPA	*Arabis sparsiflora* var. *arcuata*	elegant rockcress	Brassicaceae	Yes
ARCTO3	*Arctostaphylos*	manzanita	Ericaceae	Yes
ARPR	*Arctostaphylos (pringlei)*	Pringle manzanita	Ericaceae	Yes
ARGL3	*Arctostaphylos glandulosa*	Eastwood's manzanita	Ericaceae	Yes
ARGLC4	*Arctostaphylos glandulosa* subsp. *crassifolia*	Costa Baja manzanita	Ericaceae	Yes
ARGL4	*Arctostaphylos glauca*	bigberry manzanita	Ericaceae	Yes

Code	Scientific Name	Common Name	Family	Native
ARPU5	*Arctostaphylos pungens*	pointleaf manzanita	Ericaceae	Yes
ARDI5	*Aristida divaricata*	spreading threeawn	Poaceae	Yes
ARPU9	*Aristida purpurea*	purple threeawn	Poaceae	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
ARDO4	*Arundo donax*	giant reed	Poaceae	No
ASCLE	*Asclepias*	milkweed	Asclepiadaceae	Yes
ASCA3	*Asclepias californica*	California milkweed	Asclepiadaceae	Yes
ASER	*Asclepias eriocarpa*	Kotolo milkweed	Asclepiadaceae	Yes
ASER2	*Asclepias erosa*	desert milkweed	Asclepiadaceae	Yes
ASFA	*Asclepias fascicularis*	Mexican whorled milkweed	Asclepiadaceae	Yes
ASSE12	*Asparagus setaceus*	common asparagus fern	Liliaceae	No
ASTER	*Aster*		Asteraceae	Yes
ASCH2	*Aster chilensis*	Pacific aster	Asteraceae	Yes
ASTRA	*Astragalus*	locoweed	Fabaceae	Yes
ASGA	*Astragalus gambelianus*	Gambel's dwarf milkvetch	Fabaceae	Yes
ATRIP	*Atriplex*	saltbush	Chenopodiaceae	Unknown
ATCA2	*Atriplex canescens*	fourwing saltbush	Chenopodiaceae	Yes
ATLE	*Atriplex lentiformis*	big saltbush	Chenopodiaceae	Yes
ATLEL	*Atriplex lentiformis* subsp. *lentiformis*	big saltbush	Chenopodiaceae	Yes
ATRO	*Atriplex rosea*	tumbling saltweed	Chenopodiaceae	No
ATSE	*Atriplex semibaccata*	Australian saltbush	Chenopodiaceae	No
AVENA	*Avena*	oat	Poaceae	No
AVBA	*Avena barbata*	slender oat	Poaceae	No
AVFA	*Avena fatua*	wild oat	Poaceae	No
BACCH	*Baccharis*	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
BEJU	*Bebbia juncea*	sweetbrush	Asteraceae	Yes
BEPI	*Berberis (pinnata)*	wavyleaf barberry	Berberidaceae	Yes
BEIN	*Bernardia incana*	hoary myrtlecroton	Euphorbiaceae	Yes
BLCR	*Bloomeria crocea*	common goldenstar	Liliaceae	Yes
BRDI2	*Brachypodium distachyon*	purple false brome	Poaceae	No
BRASS2	*Brassica*	mustard	Brassicaceae	No
BRNI	*Brassica nigra*	black mustard	Brassicaceae	No
BRRA	*Brassica rapa*	rape mustard	Brassicaceae	No
BRTO	*Brassica tournefortii*	Asian mustard	Brassicaceae	Yes
BRCA3	*Brickellia californica*	California brickellbush	Asteraceae	Yes
BRCAC	*Brickellia californica* var. *californica*	California brickellbush	Asteraceae	Yes
BRMI2	*Briza minor*	little quakinggrass	Poaceae	No
BRTEK	*Brodiaea terrestris* subsp. *kernensis*	Kern brodiaea	Liliaceae	Yes
BROMU	*Bromus*	brome	Poaceae	Unknown

Code	Scientific Name	Common Name	Family	Native
BRAR3	*Bromus arenarius*	Australian brome	Poaceae	No
BRCA5	*Bromus carinatus*	California brome	Poaceae	Yes
BRDI3	*Bromus diandrus*	ripgut grass	Poaceae	No
BRHO2	*Bromus hordeaceus*	soft brome	Poaceae	No
BRMA3	*Bromus madritensis*	Spanish brome	Poaceae	No
BRST2	*Bromus sterilis*	poverty brome	Poaceae	No
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
CAAL2	*Calochortus albus*	white globelily	Liliaceae	Yes
CAPL2	*Calochortus plummerae*	Plummer's mariposa lily	Liliaceae	Yes
CASP	*Calochortus splendens*	splendid mariposa lily	Liliaceae	Yes
CASU3	*Calochortus superbus*	yellow mariposa	Liliaceae	Yes
CAWE	*Calochortus weedii*	Weed's mariposa lily	Liliaceae	Yes
CALYS	*Calystegia*	morning-glory	Convolvulaceae	Yes
CAMA24	*Calystegia macrostegia*	island false bindweed	Convolvulaceae	Yes
CAOC6	*Calystegia occidentalis*	chaparral false bindweed	Convolvulaceae	Yes
CAMIS	*Camissonia*	suncup	Onagraceae	Yes
CABI12	*Camissonia bistorta*	California sun cup	Onagraceae	Yes
CACA32	*Camissonia californica*	California suncup	Onagraceae	Yes
CAHI13	*Camissonia hirtella*	Santa Cruz Island suncup	Onagraceae	Yes
CAPA36	*Camissonia pallida*	paleyellow suncup	Onagraceae	Yes
CAPU16	*Camissonia pusilla*	little wiry suncup	Onagraceae	Yes
CAST20	*Camissonia strigulosa*	sandysoil suncup	Onagraceae	Yes
CAPY2	*Carduus pycnocephalus*	Italian thistle	Asteraceae	No
CAREX	*Carex*	carex	Cyperaceae	Unknown
CAPR5	*Carex praegracilis*	clustered field sedge	Cyperaceae	Yes
CASP6	*Carex spissa*	San Diego sedge	Cyperaceae	Yes
CARPO	*Carpobrotus*	fig-marigold	Aizoaceae	No
CACH38	*Carpobrotus chilensis*	sea fig	Aizoaceae	No
CAED3	*Carpobrotus edulis*	hottentot fig	Aizoaceae	No
CASTI2	*Castilleja*	Indian paintbrush	Scrophulariaceae	Yes
CAEX14	*Castilleja exserta*	purple owl's-clover	Scrophulariaceae	Yes
CEANO	*Ceanothus*	ceanothus	Rhamnaceae	Yes
CECO	*Ceanothus cordulatus*	whitethorn ceanothus	Rhamnaceae	Yes
CECR	*Ceanothus crassifolius*	hoaryleaf ceanothus	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
CEVE2	*Ceanothus verrucosus*	barranca brush	Rhamnaceae	Yes
CEME2	*Centaurea melitensis*	Maltese star-thistle	Asteraceae	No
CEVE3	*Centaurium venustum*	charming centaury	Gentianaceae	Yes
CERAS	*Cerastium*	mouse-ear chickweed	Caryophyllaceae	Unknown
CEBE3	*Cercocarpus betuloides*	birchleaf mountain-mahogany	Rosaceae	Yes

Code	Scientific Name	Common Name	Family	Native
CEMI3	*Cercocarpus minutiflorus*	San Diego mountain-mahogany	Rosaceae	Yes
CHAEN	*Chaenactis*	pincushion	Asteraceae	Yes
CHAR	*Chaenactis artemisiifolia*	white pincushion	Asteraceae	Yes
CHFR	*Chaenactis fremontii*	pincushion flower	Asteraceae	Yes
CHGL	*Chaenactis glabriuscula*	yellow pincushion	Asteraceae	Yes
CHAMA15	*Chamaesyce*	sandmat	Euphorbiaceae	Unknown
CHAL11	*Chamaesyce albomarginata*	whitemargin sandmat	Euphorbiaceae	Yes
CHPO12	*Chamaesyce polycarpa*	smallseed sandmat	Euphorbiaceae	Yes
CHEIL	*Cheilanthes*	lipfern	Pteridaceae	Yes
CHENO	*Chenopodium*	goosefoot	Chenopodiaceae	Unknown
CHCA3	*Chenopodium californicum*	California goosefoot	Chenopodiaceae	Yes
CHRU	*Chenopodium rubrum*	red goosefoot	Chenopodiaceae	Yes
CHLI2	*Chilopsis linearis*	desert willow	Bignoniaceae	Yes
CHPA7	*Chlorogalum parviflorum*	smallflower soap plant	Liliaceae	Yes
CHORI2	*Chorizanthe*	spineflower	Polygonaceae	Yes
CHFI2	*Chorizanthe fimbriata*	fringed spineflower	Polygonaceae	Yes
CHPR4	*Chorizanthe procumbens*	prostrate spineflower	Polygonaceae	Yes
CHST4	*Chorizanthe staticoides*	turkish rugging	Polygonaceae	Yes
CHRYS9	*Chrysothamnus*	rabbitbrush	Asteraceae	Yes
CIDO	*Cicuta douglasii*	western water hemlock	Apiaceae	Yes
CIRSI	*Cirsium*	thistle	Asteraceae	Unknown
CIOC	*Cirsium occidentale*	cobwebby thistle	Asteraceae	Yes
CITI	*Cirsium tioganum*	stemless thistle	Asteraceae	Yes
CIVU	*Cirsium vulgare*	bull thistle	Asteraceae	No
CLARK	*Clarkia*	clarkia	Onagraceae	Yes
CLPU2	*Clarkia purpurea*	winecup clarkia	Onagraceae	Yes
CLRH	*Clarkia rhomboidea*	diamond clarkia	Onagraceae	Yes
CLEX2	*Claytonia exigua*	serpentine 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
CLPA2	*Clematis pauciflora*	ropevine clematis	Ranunculaceae	Yes
CNDU	*Cneoridium dumosum*	bush rue	Rutaceae	Yes
CORA	*Coleogyne ramosissima*	blackbrush	Rosaceae	Yes
COHE	*Collinsia heterophylla*	purple Chinese houses	Scrophulariaceae	Yes
COGR4	*Collomia grandiflora*	grand collomia	Polemoniaceae	Yes
CODID2	*Comarostaphylis diversifolia* subsp. *diversifolia*	summer holly	Ericaceae	Yes
COMA2	*Conium maculatum*	poison hemlock	Apiaceae	No
CONYZ	*Conyza*	horseweed	Asteraceae	Unknown
COCA5	*Conyza canadensis*	Canadian horseweed	Asteraceae	No
CORI2	*Cordylanthus rigidus*	stiffbranch bird's beak	Scrophulariaceae	Yes
CONU4	*Cornus nuttallii*	Pacific dogwood	Cornaceae	Yes
COJU2	*Cortaderia jubata*	purple pampas grass	Poaceae	No
COSE4	*Cortaderia selloana*	Uruguayan pampas grass	Poaceae	No

Code	Scientific Name	Common Name	Family	Native
COCO7	*Cotula coronopifolia*	common brassbuttons	Asteraceae	No
CRCO34	*Crassula connata*	sand pygmyweed	Crassulaceae	Yes
CRCA5	*Croton californicus*	California croton	Euphorbiaceae	Yes
CRYPT	*Cryptantha*	cryptantha	Boraginaceae	Yes
CRDU	*Cryptantha dumetorum*	bushloving cryptantha	Boraginaceae	Yes
CRHO3	*Cryptantha holoptera*	winged cryptantha	Boraginaceae	Yes
CRIN8	*Cryptantha intermedia*	Clearwater cryptantha	Boraginaceae	Yes
CRMI2	*Cryptantha micromeres*	pygmyflower 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
CUSCU	*Cuscuta*	dodder	Cuscutaceae	Yes
CUSA	*Cuscuta salina*	saltmarsh dodder	Cuscutaceae	Yes
CYCA	*Cynara cardunculus*	cardoon	Asteraceae	No
CYDA	*Cynodon dactylon*	Bermudagrass	Poaceae	No
CYEC	*Cynosurus echinatus*	bristly dogstail grass	Poaceae	No
CYPER	*Cyperus*	flatsedge	Cyperaceae	Unknown
CYOD	*Cyperus (odoratus)*	fragrant flatsedge	Cyperaceae	Yes
CYER2	*Cyperus erythrorhizos*	redroot flatsedge	Cyperaceae	Yes
DAGL2	*Datisca glomerata*	Durango root	Datiscaceae	Yes
DATUR	*Datura*	jimsonweed	Solanaceae	Unknown
DAWR2	*Datura wrightii*	sacred thorn-apple	Solanaceae	Yes
DAPU3	*Daucus pusillus*	American wild carrot	Apiaceae	Yes
DELPH	*Delphinium*	larkspur	Ranunculaceae	Yes
DEPA	*Delphinium parishii*	desert 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*	inland saltgrass	Poaceae	Yes
DINE2	*Ditaxis neomexicana*	New Mexico silverbush	Euphorbiaceae	Yes
DRAR3	*Dryopteris arguta*	coastal woodfern	Dryopteridaceae	Yes
DUDLE	*Dudleya*	dudleya	Crassulaceae	Yes
DUED	*Dudleya edulis*	fingertips	Crassulaceae	Yes
DUPU	*Dudleya pulverulenta*	chalk dudleya	Crassulaceae	Yes
DUSAA	*Dudleya saxosa* subsp. *aloides*	Panamint liveforever	Crassulaceae	Yes
ECEN	*Echinocereus engelmannii*	Engelmann's hedgehog cactus	Cactaceae	Yes
ECCR	*Echinochloa crus-galli*	barnyardgrass	Poaceae	No
ELEOC	*Eleocharis*	spikerush	Cyperaceae	Yes
ELMA5	*Eleocharis macrostachya*	common spikerush	Cyperaceae	Yes
ELPA4	*Eleocharis parishii*	Parish's spikerush	Cyperaceae	Yes

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ELGL	*Elymus glaucus*	blue wildrye	Poaceae	Yes
EMPE	*Emmenanthe penduliflora*	whisperingbells	Hydrophyllaceae	Yes
ENCEL	*Encelia*	brittlebush	Asteraceae	Yes
ENAC	*Encelia actonii*	Acton's brittlebush	Asteraceae	Yes
ENCA	*Encelia californica*	California encelia	Asteraceae	Yes
ENFA	*Encelia farinosa*	goldenhills	Asteraceae	Yes
EPILO	*Epilobium*	willowherb	Onagraceae	Yes
EPBR3	*Epilobium brachycarpum*	tall annual willowherb	Onagraceae	Yes
EPCA3	*Epilobium canum*	hummingbird trumpet	Onagraceae	Yes
EPCI	*Epilobium ciliatum*	fringed willowherb	Onagraceae	Yes
EQAR	*Equisetum arvense*	field horsetail	Equisetaceae	Yes
EQHY	*Equisetum hyemale*	scouringrush horsetail	Equisetaceae	Yes
EQTEB2	*Equisetum telmateia* subsp. *braunii*	giant horsetail	Equisetaceae	Yes
ERSE3	*Eremocarpus setigerus*	dove weed	Euphorbiaceae	Yes
ERIAS	*Eriastrum*	woollystar	Polemoniaceae	Yes
ERICA2	*Ericameria*	goldenbush	Asteraceae	Yes
ERLI6	*Ericameria linearifolia*	narrowleaf goldenbush	Asteraceae	Yes
ERPA24	*Ericameria parishii*	Parish's rabbitbrush	Asteraceae	Yes
ERFO2	*Erigeron foliosus*	leafy fleabane	Asteraceae	Yes
ERCR2	*Eriodictyon crassifolium*	thickleaf yerba santa	Hydrophyllaceae	Yes
ERTR7	*Eriodictyon trichocalyx*	hairy yerba santa	Hydrophyllaceae	Yes
ERIOG	*Eriogonum*	buckwheat	Polygonaceae	Yes
EREL6	*Eriogonum elongatum*	longstem buckwheat	Polygonaceae	Yes
ERFA2	*Eriogonum fasciculatum*	California buckwheat	Polygonaceae	Yes
ERGR5	*Eriogonum gracile*	slender woolly buckwheat	Polygonaceae	Yes
ERWR	*Eriogonum wrightii*	bastardsage	Polygonaceae	Yes
ERCO25	*Eriophyllum confertiflorum*	golden-yarrow	Asteraceae	Yes
ERWA7	*Eriophyllum wallacei*	woolly easterbonnets	Asteraceae	Yes
ERODI	*Erodium*	stork's bill	Geraniaceae	No
ERBO	*Erodium botrys*	longbeak stork's bill	Geraniaceae	No
ERBR14	*Erodium brachycarpum*	shortfruit stork's bill	Geraniaceae	No
ERCI6	*Erodium cicutarium*	redstem stork's bill	Geraniaceae	No
ERMO7	*Erodium moschatum*	musky stork's bill	Geraniaceae	No
ERCA14	*Erysimum capitatum*	western wallflower	Brassicaceae	Yes
ESCA2	*Eschscholzia californica*	California poppy	Papaveraceae	Yes
EUCAL	*Eucalyptus*	gum	Myrtaceae	No
EUCA2	*Eucalyptus camaldulensis*	river redgum	Myrtaceae	No
EUCL	*Eucalyptus cladocalyx*	sugargum	Myrtaceae	No
EUGL	*Eucalyptus globulus*	Tasmanian bluegum	Myrtaceae	No
EUPO	*Eucalyptus polyanthemos*	redbox	Myrtaceae	No
EUSI2	*Eucalyptus sideroxylon*	red ironbark	Myrtaceae	No
EUCRY	*Eucrypta*	hideseed	Hydrophyllaceae	Yes
EUOC4	*Euthamia occidentalis*	western goldentop	Asteraceae	Yes
FECY	*Ferocactus cylindraceus*	California barrel cactus	Cactaceae	Yes
FEVI2	*Ferocactus viridescens*	San Diego barrelcactus	Cactaceae	Yes
FESTU	*Festuca*	fescue	Poaceae	Unknown
FILAG	*Filago*	cottonrose	Asteraceae	Unknown

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FIAR	*Filago arizonica*	Arizona cottonrose	Asteraceae	Yes
FICA2	*Filago californica*	California cottonrose	Asteraceae	Yes
FIGA	*Filago gallica*	narrowleaf cottonrose	Asteraceae	No
FOVU	*Foeniculum vulgare*	sweet fennel	Apiaceae	No
FRSA	*Frankenia salina*	alkali seaheath	Frankeniaceae	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
GAMU4	*Galium murale*	yellow wall bedstraw	Rubiaceae	No
GANU	*Galium nuttallii*	climbing bedstraw	Rubiaceae	Yes
GAPO	*Galium porrigens*	graceful bedstraw	Rubiaceae	Yes
GAST	*Galium stellatum*	starry bedstraw	Rubiaceae	Yes
GAVE3	*Gastridium ventricosum*	nit grass	Poaceae	No
GEMO	*Geranium molle*	dovefoot geranium	Geraniaceae	No
GILIA	*Gilia*	gilia	Polemoniaceae	Yes
GIAN	*Gilia angelensis*	chaparral gilia	Polemoniaceae	Yes
GICA5	*Gilia capitata*	bluehead gilia	Polemoniaceae	Yes
GNAPH	*Gnaphalium*	cudweed	Asteraceae	Unknown
GNRA	*Gnaphalium (ramosissimum)*	pink cudweed	Asteraceae	Yes
GNCAB2	*Gnaphalium canescens* subsp. *beneolens*	Wright's cudweed	Asteraceae	Yes
GNLU	*Gnaphalium luteoalbum*	Jersey cudweed	Asteraceae	No
GNPA	*Gnaphalium palustre*	western marsh cudweed	Asteraceae	Yes
GRHI	*Grindelia hirsutula*	hairy gumweed	Asteraceae	Yes
GUTIE	*Gutierrezia*	snakeweed	Asteraceae	Yes
GUCA	*Gutierrezia californica*	San Joaquin snakeweed	Asteraceae	Yes
GUMI	*Gutierrezia microcephala*	threadleaf snakeweed	Asteraceae	Yes
GUSA2	*Gutierrezia sarothrae*	broom snakeweed	Asteraceae	Yes
HASQ2	*Hazardia squarrosa*	sawtooth goldenbush	Asteraceae	Yes
HECR2	*Hedypnois cretica*	Cretanweed	Asteraceae	No
HESC2	*Helianthemum scoparium*	Bisbee Peak rushrose	Cistaceae	Yes
HELIA3	*Helianthus*	sunflower	Asteraceae	Yes
HEAN3	*Helianthus annuus*	common sunflower	Asteraceae	Yes
HEGR3	*Helianthus gracilentus*	slender sunflower	Asteraceae	Yes
HECU3	*Heliotropium curassavicum*	salt heliotrope	Boraginaceae	Yes
HEFA	*Hemizonia fasciculata*	clustered tarweed	Asteraceae	Yes
HEAR5	*Heteromeles arbutifolia*	toyon	Rosaceae	Yes
HESE	*Heterotheca sessiliflora*	sessileflower false goldenaster	Asteraceae	Yes
HIIN3	*Hirschfeldia incana*	shortpod mustard	Brassicaceae	No
HOMA4	*Hoita macrostachya*	large leather-root	Fabaceae	Yes
HORDE	*Hordeum*	barley	Poaceae	Unknown
HOBR2	*Hordeum brachyantherum*	meadow barley	Poaceae	Yes
HOMA2	*Hordeum marinum*	seaside barley	Poaceae	Yes
HOMU	*Hordeum murinum*	mouse barley	Poaceae	No
HUCA	*Hulsea californica*	San Diego alpinegold	Asteraceae	Yes
HYSA	*Hymenoclea salsola*	burrobrush	Asteraceae	Yes

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HYGL2	*Hypochaeris glabra*	smooth catsear	Asteraceae	No
IPOMO2	*Ipomopsis*	ipomopsis	Polemoniaceae	Yes
IRMI	*Iris missouriensis*	Rocky Mountain iris	Iridaceae	Yes
ISAC2	*Isocoma acradenia*	alkali goldenbush	Asteraceae	Yes
ISME5	*Isocoma menziesii*	Menzies' goldenbush	Asteraceae	Yes
ISAR	*Isomeris arborea*	bladderpod spiderflower	Capparaceae	Yes
IVHA	*Iva hayesiana*	San Diego povertyweed	Asteraceae	Yes
JUNCU	*Juncus*	rush	Juncaceae	Yes
JUACL	*Juncus acutus* subsp. *leopoldii*	Leopold's rush	Juncaceae	Yes
JUBU	*Juncus bufonius*	toad rush	Juncaceae	Yes
JUDU	*Juncus dubius*	dubius rush	Juncaceae	Yes
JUEF	*Juncus effusus*	common rush	Juncaceae	Yes
JUME4	*Juncus mexicanus*	Mexican rush	Juncaceae	Yes
JUOX	*Juncus oxymeris*	pointed rush	Juncaceae	Yes
JUPH	*Juncus phaeocephalus*	brownhead rush	Juncaceae	Yes
JURU	*Juncus rugulosus*	wrinkled rush	Juncaceae	Yes
JUTE2	*Juncus textilis*	basket rush	Juncaceae	Yes
JUXI	*Juncus xiphioides*	irisleaf rush	Juncaceae	Yes
JUCA7	*Juniperus californica*	California juniper	Cupressaceae	Yes
KEAN	*Keckiella antirrhinoides*	snapdragon penstemon	Scrophulariaceae	Yes
KECO	*Keckiella cordifolia*	heartleaf keckiella	Scrophulariaceae	Yes
KETE	*Keckiella ternata*	scarlet keckiella	Scrophulariaceae	Yes
KOMA	*Koeleria macrantha*	prairie Junegrass	Poaceae	Yes
KRER	*Krameria erecta*	littleleaf ratany	Krameriaceae	Yes
KRGR	*Krameria grayi*	white ratany	Krameriaceae	Yes
LASE	*Lactuca serriola*	prickly lettuce	Asteraceae	No
LAAU	*Lamarckia aurea*	goldentop grass	Poaceae	No
LAMIU	*Lamium*	deadnettle	Lamiaceae	No
LATR2	*Larrea tridentata*	creosote bush	Zygophyllaceae	Yes
LACA7	*Lasthenia californica*	California goldfields	Asteraceae	Yes
LAVE2	*Lathyrus vestitus*	Pacific pea	Fabaceae	Yes
LAVEA4	*Lathyrus vestitus* var. *alefeldii*	Alefeld's pea	Fabaceae	Yes
LAGL5	*Layia glandulosa*	whitedaisy tidytips	Asteraceae	Yes
LAPL	*Layia platyglossa*	coastal tidytips	Asteraceae	Yes
LEPID	*Lepidium*	pepperweed	Brassicaceae	Unknown
LELA2	*Lepidium latifolium*	broadleaved pepperweed	Brassicaceae	No
LEFI11	*Lessingia filaginifolia*	common sandaster	Asteraceae	Yes
LECO12	*Leymus condensatus*	giant wildrye	Poaceae	Yes
LETR5	*Leymus triticoides*	beardless wildrye	Poaceae	Yes
LICHEN	*Lichen*	lichen	Unknown	Yes
LINAN2	*Linanthus*	linanthus	Polemoniaceae	Yes
LIAN	*Linanthus androsaceus*	false babystars	Polemoniaceae	Yes
LILI2	*Linanthus liniflorus*	narrowflower flaxflower	Polemoniaceae	Yes
LIPA12	*Linanthus parviflorus*	variable linanthus	Polemoniaceae	Yes
LIAF	*Lithophragma affine*	San Francisco woodland-star	Saxifragaceae	Yes

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LOMU	*Lolium multiflorum*	Italian ryegrass	Poaceae	No
LODA	*Lomatium dasycarpum*	woollyfruit desertparsley	Apiaceae	Yes
LOLU	*Lomatium lucidum*	shiny biscuitroot	Apiaceae	Yes
LOMO	*Lomatium mohavense*	Mojave desertparsley	Apiaceae	Yes
LOSU2	*Lonicera subspicata*	southern honeysuckle	Caprifoliaceae	Yes
LOTUS	*Lotus*	trefoil	Fabaceae	Unknown
LOAR3	*Lotus (argophyllus)*	silver bird's-foot trefoil	Fabaceae	Yes
LOHA2	*Lotus hamatus*	San Diego bird's-foot trefoil	Fabaceae	Yes
LONE4	*Lotus nevadensis*	Nevada 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
LUBI	*Lupinus bicolor*	miniature lupine	Fabaceae	Yes
LUCO	*Lupinus concinnus*	scarlet lupine	Fabaceae	Yes
LUEX	*Lupinus excubitus*	grape soda lupine	Fabaceae	Yes
LUHI3	*Lupinus hirsutissimus*	stinging annual lupine	Fabaceae	Yes
LUSP2	*Lupinus sparsiflorus*	Mojave lupine	Fabaceae	Yes
LUTR2	*Lupinus truncatus*	collared annual lupine	Fabaceae	Yes
LUZUL	*Luzula*	woodrush	Juncaceae	Yes
LYAN	*Lycium andersonii*	water jacket	Solanaceae	Yes
LYCO2	*Lycium cooperi*	peach thorn	Solanaceae	Yes
MADE	*Malacothamnus densiflorus*	yellowstem bushmallow	Malvaceae	Yes
MAFA	*Malacothamnus fasciculatus*	Mendocino bushmallow	Malvaceae	Yes
MALA6	*Malosma laurina*	laurel sumac	Anacardiaceae	Yes
MAMA8	*Marah macrocarpus*	Cucamonga manroot	Cucurbitaceae	Yes
MAVU	*Marrubium vulgare*	horehound	Lamiaceae	No
MEPO3	*Medicago polymorpha*	burclover	Fabaceae	No
MEIM	*Melica imperfecta*	smallflower melicgrass	Poaceae	Yes
MEAL2	*Melilotus albus*	yellow sweetclover	Fabaceae	No
MEIN2	*Melilotus indicus*	annual yellow sweetclover	Fabaceae	No
MENTH	*Mentha*	mint	Lamiaceae	Unknown
MESP3	*Mentha (spicata)*	spearmint	Lamiaceae	No
MECR3	*Mesembryanthemum crystallinum*	common iceplant	Aizoaceae	No
MICA	*Micropus californicus*	slender cottonweed	Asteraceae	Yes
MICRO6	*Microseris*	silverpuffs	Asteraceae	Yes
MIAU	*Mimulus aurantiacus*	yellow bush monkeyflower	Scrophulariaceae	Yes
MIBR4	*Mimulus brevipes*	widethroat yellow monkeyflower	Scrophulariaceae	Yes
MICA3	*Mimulus cardinalis*	scarlet monkeyflower	Scrophulariaceae	Yes
MIGU	*Mimulus guttatus*	seep monkeyflower	Scrophulariaceae	Yes
MINUA	*Minuartia*	stitchwort	Caryophyllaceae	Yes
MIDO3	*Minuartia douglasii*	Douglas' stitchwort	Caryophyllaceae	Yes
MIRAB	*Mirabilis*	four o'clock	Nyctaginaceae	Yes
MIBI8	*Mirabilis bigelovii*	wishbone-bush	Nyctaginaceae	Yes
MICA6	*Mirabilis californica*	California four o'clock	Nyctaginaceae	Yes
MILA6	*Mirabilis laevis*	California four o'clock	Nyctaginaceae	Yes

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MOLA2	*Monardella lanceolata*	mustang monardella	Lamiaceae	Yes
MOSS	*Moss*	moss	Unknown	Yes
MUMI	*Muhlenbergia microsperma*	littleseed muhly	Poaceae	Yes
MURI2	*Muhlenbergia rigens*	deergrass	Poaceae	Yes
MUMA2	*Muilla maritima*	sea muilla	Liliaceae	Yes
MYLA5	*Myoporum laetum*	ngaio tree	Myoporaceae	No
NASSE	*Nassella*	tussockgrass	Poaceae	Yes
NACE	*Nassella cernua*	nodding tussockgrass	Poaceae	Yes
NALE2	*Nassella lepida*	smallflower tussockgrass	Poaceae	Yes
NAPU4	*Nassella pulchra*	purple tussockgrass	Poaceae	Yes
NAVAR	*Navarretia*	pincushionplant	Polemoniaceae	Yes
NAHA2	*Navarretia hamata*	hooked pincushionplant	Polemoniaceae	Yes
NEME	*Nemophila menziesii*	baby blue eyes	Hydrophyllaceae	Yes
NIGL	*Nicotiana glauca*	tree tobacco	Solanaceae	No
NOPA	*Nolina parryi*	Parry's beargrass	Liliaceae	Yes
OESA	*Oenanthe sarmentosa*	water parsely	Apiaceae	Yes
OENOT	*Oenothera*	evening-primrose	Onagraceae	Yes
OEEL	*Oenothera elata*	Hooker's evening-primrose	Onagraceae	Yes
OPUNT	*Opuntia*	pricklypear	Cactaceae	Unknown
OPUNT	*Opuntia (littoralis x phaeacantha)*	prickly-pear	Cactaceae	Yes
OPAC	*Opuntia acanthocarpa*	buckhorn cholla	Cactaceae	Yes
OPBA2	*Opuntia basilaris*	beavertail pricklypear	Cactaceae	Yes
OPCH	*Opuntia chlorotica*	pancake pricklypear	Cactaceae	Yes
OPEC	*Opuntia echinocarpa*	golden cholla	Cactaceae	Yes
OPLI3	*Opuntia littoralis*	coastal pricklypear	Cactaceae	Yes
OPPH	*Opuntia phaeacantha*	tulip pricklypear	Cactaceae	Yes
OPPR	*Opuntia prolifera*	coastal cholla	Cactaceae	Yes
OSTE	*Osmadenia tenella*	false rosinweed	Asteraceae	Yes
OSMOR	*Osmorhiza*	sweetroot	Apiaceae	Yes
OSBR	*Osmorhiza brachypoda*	California sweetcicely	Apiaceae	Yes
OXPE	*Oxalis pes-caprae*	Bermuda buttercup	Oxalidaceae	No
PACA2	*Paeonia californica*	California peony	Paeoniaceae	Yes
PACA6	*Panicum capillare*	witchgrass	Poaceae	Yes
PADI6	*Paspalum distichum*	knotgrass	Poaceae	Yes
PECTO	*Pectocarya*	combseed	Boraginaceae	Yes
PERE	*Pectocarya recurvata*	curvenut combseed	Boraginaceae	Yes
PEAN2	*Pellaea andromedifolia*	coffee cliffbrake	Pteridaceae	Yes
PEMU	*Pellaea mucronata*	birdfoot cliffbrake	Pteridaceae	Yes
PEMUC2	*Pellaea mucronata* subsp. *californica*	California cliffbrake	Pteridaceae	Yes
PENST	*Penstemon*	beardtongue	Scrophulariaceae	Yes
PECE2	*Penstemon centranthifolius*	scarlet bugler	Scrophulariaceae	Yes
PESP3	*Penstemon spectabilis*	showy penstemon	Scrophulariaceae	Yes
PEAU3	*Pentachaeta aurea*	golden chaetopappa	Asteraceae	Yes
PETR7	*Pentagramma triangularis*	goldback fern	Pteridaceae	Yes
PHACE	*Phacelia*	phacelia	Hydrophyllaceae	Yes
PHCI	*Phacelia cicutaria*	caterpillar phacelia	Hydrophyllaceae	Yes

Code	Scientific Name	Common Name	Family	Native
PHDI	*Phacelia distans*	distant phacelia	Hydrophyllaceae	Yes
PHIM	*Phacelia imbricata*	imbricate phacelia	Hydrophyllaceae	Yes
PHPA3	*Phacelia parryi*	Parry's phacelia	Hydrophyllaceae	Yes
PHRA	*Phacelia racemosa*	racemose phacelia	Hydrophyllaceae	Yes
PHRAA	*Phacelia ramosissima* var. *austrolitoralis*	branching phacelia	Hydrophyllaceae	Yes
PHALA2	*Phalaris*	canarygrass	Poaceae	Unknown
PHILA	*Philadelphus*	mock orange	Hydrangeaceae	Yes
PHLEU	*Phleum*	timothy	Poaceae	No
PHOLI2	*Pholistoma*	fiestaflower	Hydrophyllaceae	Yes
PHAU4	*Pholistoma (auritum)*	blue fiestaflower	Hydrophyllaceae	Yes
PHCA8	*Phoradendron californicum*	mesquite mistletoe	Viscaceae	Yes
PHDE14	*Phoradendron densum*	dense mistletoe	Viscaceae	Yes
PHMA18	*Phoradendron macrophyllum*	Colorado Desert mistletoe	Viscaceae	Yes
PHVI9	*Phoradendron villosum*	Pacific mistletoe	Viscaceae	Yes
PHLA3	*Phyla lanceolata*	lanceleaf fogfruit	Verbenaceae	Yes
PIEC	*Picris echioides*	bristly oxtongue	Asteraceae	No
PICO3	*Pinus coulteri*	Coulter pine	Pinaceae	Yes
PITO	*Pinus torreyana*	Torrey pine	Pinaceae	Yes
PIMI3	*Piptatherum miliaceum*	smilograss	Poaceae	No
PLAGI	*Plagiobothrys*	popcornflower	Boraginaceae	Yes
PLAR	*Plagiobothrys arizonicus*	Arizona popcornflower	Boraginaceae	Yes
PLANT	*Plantago*	plantain	Plantaginaceae	Unknown
PLPA2	*Plantago (patagonica)*	woolly plantain	Plantaginaceae	Unknown
PLER3	*Plantago erecta*	dotseed plantain	Plantaginaceae	Yes
PLRA	*Platanus racemosa*	California sycamore	Platanaceae	Yes
PLRI3	*Pleuraphis rigida*	big galleta	Poaceae	Yes
PLOD	*Pluchea odorata*	sweetscent	Asteraceae	Yes
POA	*Poa*	bluegrass	Poaceae	Unknown
POPR	*Poa pratensis*	Kentucky bluegrass	Poaceae	No
POSE	*Poa secunda*	Sandberg bluegrass	Poaceae	Yes
POACXX	Poaceae		Poaceae	Unknown
POLYG4	*Polygonum*	knotweed	Polygonaceae	Unknown
POCA12	*Polypodium californicum*	California polypody	Polypodiaceae	Yes
POLYP2	*Polypogon*	rabbitsfoot grass	Poaceae	Unknown
POIN7	*Polypogon interruptus*	ditch rabbitsfoot grass	Poaceae	No
POMO5	*Polypogon monspeliensis*	rabbitfootgrass	Poaceae	No
POIM	*Polystichum imbricans*	narrowleaf swordfern	Dryopteridaceae	Yes
POBA2	*Populus balsamifera*	balsam poplar	Salicaceae	Yes
POFR2	*Populus fremontii*	Fremont cottonwood	Salicaceae	Yes
PONO2	*Potamogeton nodosus*	longleaf pondweed	Potamogetonaceae	Yes
POTEN	*Potentilla*	cinquefoil	Rosaceae	Yes
POGL9	*Potentilla glandulosa*	sticky cinquefoil	Rosaceae	Yes
PRGL2	*Prosopis glandulosa*	honey mesquite	Fabaceae	Yes
PRUNU	*Prunus*	plum	Rosaceae	Unknown
PRAN2	*Prunus andersonii*	desert peach	Rosaceae	Yes

Code	Scientific Name	Common Name	Family	Native
PRFA	*Prunus fasciculata*	desert almond	Rosaceae	Yes
PRFR	*Prunus fremontii*	desert apricot	Rosaceae	Yes
PRIL	*Prunus ilicifolia*	hollyleaf cherry	Rosaceae	Yes
PRVI	*Prunus virginiana*	chokecherry	Rosaceae	Yes
PSMA	*Pseudotsuga macrocarpa*	bigcone Douglas-fir	Pinaceae	Yes
PSSC5	*Psorothamnus schottii*	Schott's dalea	Fabaceae	Yes
PTAQ	*Pteridium aquilinum*	brackenfern	Dennstaedtiaceae	Yes
PTDR	*Pterostegia drymarioides*	woodland pterostegia	Polygonaceae	Yes
QUGR4	*Quercus*	oak	Fagaceae	Yes
QUAG	*Quercus agrifolia*	California live oak	Fagaceae	Yes
QUBE5	*Quercus berberidifolia*	scrub oak	Fagaceae	Yes
QUCH2	*Quercus chrysolepis*	canyon live oak	Fagaceae	Yes
QUCO7	*Quercus cornelius-mulleri*	Muller oak	Fagaceae	Yes
QUDU	*Quercus dumosa*	coastal sage scrub oak	Fagaceae	Yes
QUEN	*Quercus engelmannii*	Engelmann oak	Fagaceae	Yes
QUKE	*Quercus kelloggii*	California black oak	Fagaceae	Yes
QUWIF	*Quercus wislizeni* var. *frutescens*	interior live oak	Fagaceae	Yes
RACA	*Rafinesquia californica*	California plumseed	Asteraceae	Yes
RACA2	*Ranunculus californicus*	California buttercup	Ranunculaceae	Yes
RHCA	*Rhamnus californica*	California buckthorn	Rhamnaceae	Yes
RHCR	*Rhamnus crocea*	redberry buckthorn	Rhamnaceae	Yes
RHIL	*Rhamnus ilicifolia*	hollyleaf redberry	Rhamnaceae	Yes
RHPI4	*Rhamnus pilosa*	hollyleaf redberry	Rhamnaceae	Yes
RHTO6	*Rhamnus tomentella*	chaparral coffeeberry	Rhamnaceae	Yes
RHOC	*Rhododendron occidentale*	western azalea	Ericaceae	Yes
RHIN2	*Rhus integrifolia*	lemonade sumac	Anacardiaceae	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
RICA	*Ribes californicum*	hillside gooseberry	Grossulariaceae	Yes
RIIN	*Ribes indecorum*	whiteflower currant	Grossulariaceae	Yes
RIMA	*Ribes malvaceum*	chaparral currant	Grossulariaceae	Yes
RINE	*Ribes nevadense*	Sierra currant	Grossulariaceae	Yes
RIRO	*Ribes roezlii*	Sierra gooseberry	Grossulariaceae	Yes
RISP	*Ribes speciosum*	fuchsiaflower gooseberry	Grossulariaceae	Yes
ROPS	*Robinia pseudoacacia*	black locust	Fabaceae	No
RORIP	*Rorippa*	yellowcress	Brassicaceae	Yes
RONA2	*Rorippa nasturtium-aquaticum*	watercress	Brassicaceae	No
ROCA2	*Rosa californica*	California wildrose	Rosaceae	Yes
RUDI2	*Rubus discolor*	Himalayan blackberry	Rosaceae	No
RULE	*Rubus leucodermis*	western raspberry	Rosaceae	Yes
RUUR	*Rubus ursinus*	California blackberry	Rosaceae	Yes
RUMEX	*Rumex*	dock	Polygonaceae	No
RUAC3	*Rumex acetosella*	common sheep sorrel	Polygonaceae	No
RUCR	*Rumex crispus*	curly dock	Polygonaceae	No

Code	Scientific Name	Common Name	Family	Native
RUSA	*Rumex salicifolius*	willow dock	Polygonaceae	Yes
RURI2	*Rupertia rigida*	Parish's California tea	Fabaceae	Yes
SASU2	*Salicornia subterminalis*	Parish's glasswort	Chenopodiaceae	Yes
SAVI	*Salicornia virginica*	Virginia 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
SATR12	*Salsola tragus*	prickly Russian thistle	Chenopodiaceae	No
SAAP2	*Salvia apiana*	white 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*	blue elderberry	Caprifoliaceae	Yes
SAPA9	*Samolus parviflorus*	seaside brookweed	Primulaceae	Yes
SANIC	*Sanicula*	sanicle	Apiaceae	Yes
SABI3	*Sanicula bipinnatifida*	purple sanicle	Apiaceae	Yes
SACR2	*Sanicula crassicaulis*	Pacific blacksnakeroot	Apiaceae	Yes
SACYH2	*Sarcostemma cynanchoides* subsp. *hartwegii*	Hartweg's twinevine	Asclepiadaceae	Yes
SCMO	*Schinus molle*	Peruvian peppertree	Anacardiaceae	No
SCTE	*Schinus terebinthifolius*	Brazilian peppertree	Anacardiaceae	No
SCHIS	*Schismus*	Mediterranean grass	Poaceae	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
SCCA2	*Scrophularia californica*	California figwort	Scrophulariaceae	Yes
SCTU2	*Scutellaria tuberosa*	Danny's skullcap	Lamiaceae	Yes
SEBI	*Selaginella bigelovii*	bushy spikemoss	Selaginellaceae	Yes
SECI	*Selaginella cinerascens*	mesa spikemoss	Selaginellaceae	Yes
SECA	*Senecio californicus*	California ragwort	Asteraceae	Yes
SIMA2	*Sidalcea malviflora*	dwarf checkerbloom	Malvaceae	Yes
SIMAS	*Sidalcea malviflora* subsp. *sparsifolia*	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
SIOF	*Sisymbrium officinale*	hedgemustard	Brassicaceae	No
SIBE	*Sisyrinchium bellum*	western blue-eyed grass	Iridaceae	Yes
SOLAN	*Solanum*	nightshade	Solanaceae	Unknown
SOPA	*Solanum parishii*	Parish's nightshade	Solanaceae	Yes
SOXA	*Solanum xanti*	chaparral nightshade	Solanaceae	Yes

Code	Scientific Name	Common Name	Family	Native
SOCA5	*Solidago californica*	California goldenrod	Asteraceae	Yes
SOAR2	*Sonchus arvensis*	field sowthistle	Asteraceae	No
SOAS	*Sonchus asper*	spiny sowthistle	Asteraceae	No
SOOL	*Sonchus oleraceus*	common sowthistle	Asteraceae	No
SPHAE	*Sphaeralcea*	globemallow	Malvaceae	Yes
SPAM2	*Sphaeralcea ambigua*	desert globemallow	Malvaceae	Yes
SPAI	*Sporobolus airoides*	alkali sacaton	Poaceae	Yes
SPCR	*Sporobolus cryptandrus*	sand dropseed	Poaceae	Yes
STAJR	*Stachys ajugoides* var. *rigida*	rough hedgenettle	Lamiaceae	Yes
STAL	*Stachys albens*	whitestem hedgenettle	Lamiaceae	Yes
STBU	*Stachys bullata*	California hedgenettle	Lamiaceae	Yes
SNAG	*Standing snag*	standing snag	Unknown	Unknown
STELL	*Stellaria*	starwort	Caryophyllaceae	Unknown
STME2	*Stellaria media*	common chickweed	Caryophyllaceae	No
STDI6	*Stephanomeria diegensis*	wreathplant	Asteraceae	Yes
STEX	*Stephanomeria exigua*	small wirelettuce	Asteraceae	Yes
STVI2	*Stephanomeria virgata*	rod wirelettuce	Asteraceae	Yes
STLI3	*Stillingia linearifolia*	queen's-root	Euphorbiaceae	Yes
STGN	*Stylocline gnaphalioides*	mountain neststraw	Asteraceae	Yes
SYAL	*Symphoricarpos albus*	common snowberry	Caprifoliaceae	Yes
SYMO	*Symphoricarpos mollis*	creeping snowberry	Caprifoliaceae	Yes
TAMAR2	*Tamarix*	tamarisk	Tamaricaceae	No
TAAP	*Tamarix aphylla*	Athel tamarisk	Tamaricaceae	No
TARA	*Tamarix ramosissima*	saltcedar	Tamaricaceae	No
TAOF	*Taraxacum officinale*	common dandelion	Asteraceae	No
THFE	*Thalictrum fendleri*	Fendler's meadow-rue	Ranunculaceae	Yes
THMO	*Thamnosma montana*	turpentinebroom	Rutaceae	Yes
THYSA	*Thysanocarpus*	fringepod	Brassicaceae	Yes
TODI	*Toxicodendron diversilobum*	Pacific poison oak	Anacardiaceae	Yes
TRLA3	*Trichostema lanatum*	woolly bluecurls	Lamiaceae	Yes
TRLA4	*Trichostema lanceolatum*	vinegarweed	Lamiaceae	Yes
TRPA3	*Trichostema parishii*	Parish's bluecurls	Lamiaceae	Yes
TRIFO	*Trifolium*	clover	Fabaceae	Unknown
TRCI	*Trifolium ciliolatum*	foothill clover	Fabaceae	Yes
TRGR2	*Trifolium gracilentum*	pinpoint clover	Fabaceae	Yes
TRHI4	*Trifolium hirtum*	rose clover	Fabaceae	No
TRRE3	*Trifolium repens*	white clover	Fabaceae	No
TRWI3	*Trifolium willdenovii*	tomcat clover	Fabaceae	Yes
TRWO	*Trifolium wormskioldii*	cows 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*	broadleaf cattail	Typhaceae	Yes
URLI5	*Uropappus lindleyi*	Lindley's silverpuffs	Asteraceae	Yes
URDI	*Urtica dioica*	stinging nettle	Urticaceae	Yes
URUR	*Urtica urens*	dwarf nettle	Urticaceae	No
VERBE	*Verbena*	vervain	Verbenaceae	Unknown

Code	Scientific Name	Common Name	Family	Native
VICIA	*Vicia*	vetch	Fabaceae	Unknown
VIAM	*Vicia americana*	American vetch	Fabaceae	Yes
VIVI	*Vicia villosa*	winter vetch	Fabaceae	No
VIGUI	*Viguiera*	goldeneye	Asteraceae	Yes
VIPA14	*Viguiera parishii*	Parish's goldeneye	Asteraceae	Yes
VIMA	*Vinca major*	bigleaf periwinkle	Apocynaceae	No
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
VUMY	*Vulpia myuros*	rat-tail fescue	Poaceae	No
WAFI	*Washingtonia filifera*	California fan palm	Arecaceae	Unknown
WOFI	*Woodwardia fimbriata*	giant chainfern	Blechnaceae	Yes
WYOV	*Wyethia ovata*	southern mule-ears	Asteraceae	Yes
XANTH2	*Xanthium*	cocklebur	Asteraceae	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
ZIFR	*Zigadenus fremontii*	Fremont's deathcamas	Liliaceae	Yes
ZIPA	*Ziziphus parryi*	Parry's jujube	Rhamnaceae	Yes

APPENDIX 3. Noteworthy plant species and their state and federal rarity status.

Adolphia californica (California adolphia)

CNPS List 2
CNPS R-E-D Code is 1-3-1
Global rank is G3G4, and state rank is S3.1
Federal status is None, and state status is None

This species is found in coastal sage scrub, chaparral, and valley and foothill grasslands (clay soil) from 45 - 740 meters elevation. It is threatened by urbanization, road construction, non-native plants, and grazing. It is only known from San Diego County in California, south to Baja California (CNPS 2005).

Arctostaphylos glandulosa subsp. *crassifolia (*Del Mar manzanita)

CNPS List 1B
CNPS R-E-D Code is 3-3-2
Global rank is G5T1, and state rank is S1.1
Federal status is FE, and state status is None

This species is found in maritime chaparral (sandy soils) from 0-365 meters elevation. It is threatened by urbanization, agricultural conversion, and fuel modification. It is only known from San Diego County in California, south to Baja California. The California populations have declined greatly. It is reported to intergrade with subsp. zacaensis (CNPS 2005).

Ceanothus verrucosus (wart-stemmed ceanothus)

CNPS List 2
CNPS R-E-D Code is 2-2-1
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 from 1-380 meters elevation. It is threatened by development. It is only known from San Diego County in California, south to Baja California (CNPS 2005).

Comarostaphylis diversifolia subsp. *diversifolia* (summer holly)

CNPS List 1B
CNPS R-E-D Code is 2-2-2
Global rank is G3?T2, and state rank is S2.2
Federal status is None, and state status is None

This species is found in chaparral and cismontane woodland from 1-380 meters elevation. The species is threatened by development and gravel mining. It is found in Orange, W. Riverside, and San Diego Counties in California, south to Baja California (CNPS 2005).

*Ferocactus viridescens (*San Diego barrel cactus)

CNPS List 2
CNPS R-E-D Code is 1-3-1
Global rank is G4, and state rank is S3.1
Federal status is None, and state status is None

This species is found in chaparral, coastal scrub, valley and foothill grassland, and vernal pool habitats from 3-450 meters elevation. It is seriously threatened by urbanization, vehicles, horticultural collecting,

agriculture, and non-native plants. It is only known from San Diego County in California, south to Baja California (CNPS 2005).

Iva hayesiana (San Diego marsh-elder)

CNPS List 2
CNPS R-E-D Code is 2-2-1
Global rank is G3?, and state rank is S2.2?
Federal status is None, and state status is None

This species is found in riparian habitats, including marshes/swamps and playas from 10-500 meters in elevation. It is threatened by waterway channelization and coastal development. The species is only known from San Diego County in California, south to Baja California (CNPS 2005).

Hulsea californica

CNPS List 1B
CNPS R-E-D Code is 2-1-3
Global rank is G2, and state rank is S2.1
Federal status is None, and state status is None

This species is found in chaparral and montane coniferous forest, including openings and burned areas from 915 to 2915 meters in elevation. The species is only known from San Diego County in California (CNPS 2005).

Juncus acutus subsp. *leopoldii* (southwestern spiny rush)

CNPS List 4
CNPS R-E-D Code is 1-2-1
Global rank is G5T5, and state rank is S3.2
Federal status is None, and state status is None

This species is found in mesic coastal dunes, alkaline seeps, and coastal salt marshes from 3-900 meters elevation. It is threatened by urbanization and flood control. It is known from Los Angeles, Orange, Santa Barbara, San Diego, Ventura, San Luis Obispo, and possibly Imperial Counties in California. It also occurs south to Baja California and possibly elsewhere such as Arizona (CNPS 2005).

Pentachaeta aurea (golden-rayed pentachaeta)

CNPS List 4
CNPS R-E-D Code is 1-2-2
Global rank is G4, and state rank is S3.2
Federal status is None, and state status is None

This species is found in cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grassland habitats from 80-1850 meters in elevation. It is known to be threatened by non-native plants. The species is found in Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties in California, and south to Baja California (CNPS 2005).

Quercus dumosa (Nuttall's scrub oak)

CNPS List 1B
CNPS R-E-D Code is 2-3-2
Global rank is G2, and state rank is S1.1
Federal status is None, and state status is None

This species is found in closed-cone coniferous forest, chaparral, coastal scrub (on sandy, clay loam soils) from 15-400 meters elevation. It is threatened by development. There is a widespread scrub oak from much of cismontane CA, previously called Q. dumosa, but it is now recognized separately as Q. berberidifolia. The species is found in Orange, Santa Barbara, San Diego 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 found in Los Angeles, Orange, Riverside, and San Diego Counties as well as Santa Catalina Island in California, though only one tree remains on the island. It is threatened by development and grazing, but its habitat is partly protected at the Santa Rosa Plateau Preserve in Western Riverside County. It also occurs south to Baja California (CNPS 2005). See Fremontia 18(3):26-35 (1990) for species account and ecological discussion.

***Rupertia rigida* (Parish's rupertia)**

CNPS List 4
CNPS R-E-D Code is 1-1-2
Global rank is G3, and state rank is S3.3
Federal status is None, and state status is None

This species is found in chaparral, cismontane woodland, riparian woodland, and lower montane coniferous forest habitats from 7-2500 meters in elevation. It is found in Riverside, San Bernardino, 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 U.S. National Vegetation Classification (NVC) and potential Holland (1986) and WHR (Mayer and Laudenslayer 1988) types

Alliance	Association	Code	Holland	Code	CWHR
Tree Overstory Vegetation					
Abies concolor-Calocedrus decurrens	*Abies concolor-Calocedrus decurrens-Pseudotsuga macrocarpa-Pinus coulteri*	85320, 84230	Southern California White Fir Forest, Sierran Mixed Conifer Forest	WFR, SMC	White Fir, Sierran Mixed Conifer
Alnus rhombifolia	*Alnus rhombifolia-Platanus racemosa-Quercus chrysolepis*	62400	Southern Sycamore-Alder Riparian Woodland	VRI	Valley Foothill Riparian
Calocedrus decurrens	*Calocedrus decurrens-Quercus chrysolepis-Quercus kelloggii*	84230	Sierran Mixed Conifer Forest	SMC, MHC	Sierran Mixed Conifer, Montane Hardwood Conifer
Chilopsis linearis	*Chilopsis linearis*	62200	Desert Dry Wash Woodland	DSW	Desert Wash
Eucalyptus	Alliance only	11111, 62000	Eucalyptus Woodland, Riparian Woodland	EUC	Eucalyptus
Pinus coulteri	*Pinus coulteri-Quercus kelloggii*	84140	Coulter Pine Forest	MHC	Montane Hardwood - Conifer
Pinus coulteri-Quercus chrysolepis	Alliance only	84140	Coulter Pine Forest	MHC	Montane Hardwood - Conifer
Pinus torreyana	*Pinus torreyana/Artemisia californica-Rhus integrifolia*	83140	Torrey Pine Forest	PJN	Pinyon - Juniper
Platanus racemosa	*Platanus racemosa*/Annual Grass-Herb	62400	Southern Sycamore-Alder Riparian Woodland	VRI	Valley Foothill Riparian
Platanus racemosa-Populus fremontii	*Platanus racemosa-Populus fremontii/Salix lasiolepis*	61330	Southern Cottonwood-Willow Riparian Forest	VRI	Valley Foothill Riparian
Populus fremontii	*Populus fremontii/Baccharis salicifolia*	61330	Southern Cottonwood-Willow Riparian Forest	VRI	Valley Foothill Riparian
Populus fremontii	*Populus fremontii/Prosopis glandulosa*	61810	Sonoran Cottonwood - Willow Riparian Forest	DRI	Desert Riparian
Populus fremontii	*Populus fremontii-Salix gooddingii/Baccharis salicifolia*	61330	Southern Cottonwood-Willow Riparian Forest	VRI	Valley Foothill Riparian
Populus fremontii	*Populus fremontii-Salix laevigata*	61330	Southern Cottonwood-Willow Riparian Forest	VRI	Valley Foothill Riparian

Alliance	Association	Code	Holland	Code	CWHR
Pseudotsuga macrocarpa	*Pseudotsuga macrocarpa-Quercus agrifolia*	84150	Bigcone Spruce-Canyon Oak Forest	MHC	Montane Hardwood - Conifer
Pseudotsuga macrocarpa	*Pseudotsuga macrocarpa-Quercus chrysolepis*	84150	Bigcone Spruce-Canyon Oak Forest	MHC	Montane Hardwood - Conifer
Quercus agrifolia	*Quercus agrifolia*/Annual Grass-Herb	71160, 81310	Coast Live Oak Woodland, Coast Live Oak Forest	COW	Coastal Oak Woodland
Quercus agrifolia	*Quercus agrifolia/Coastal Sage Scrub*	71160, 81310	Coast Live Oak Woodland, Coast Live Oak Forest	COW	Coastal Oak Woodland
Quercus agrifolia	*Quercus agrifolia/Toxicodendron diversilobum Riparian*	61310	Southern Coast Live Oak Riparian Forest	COW	Coastal Oak Woodland
Quercus agrifolia	*Quercus agrifolia/Toxicodendron diversilobum*/Grass	71160, 81310	Coast Live Oak Woodland, Coast Live Oak Forest	COW	Coastal Oak Woodland
Quercus agrifolia	*Quercus agrifolia-Platanus racemosa/Toxicodendron diversilobum*	61310	Southern Coast Live Oak Riparian Forest	COW	Coastal Oak Woodland
Quercus agrifolia	*Quercus agrifolia-Quercus engelmannii/ Eriogonum fasciculatum*/Annual Grass-Herb	71182	Dense Engelmann Oak Woodland	COW	Coastal Oak Woodland
Quercus agrifolia	*Quercus agrifolia-Quercus kelloggii* (Peninsular Range)	81310	Coast Live Oak Forest	MHW	Montane Hardwood
Quercus chrysolepis	*Quercus chrysolepis*	81320	Canyon Live Oak Forest	MHW	Montane Hardwood
Quercus chrysolepis	*Quercus chrysolepis- Pseudotsuga macrocarpa*	84150	Bigcone Spruce-Canyon Oak Forest	MHC	Montane Hardwood - Conifer
Quercus engelmannii	*Quercus engelmannii/Adenostoma fasciculatum-Arctostaphylos glauca*	71181	Open Engelmann Oak Woodland	COW	Coastal Oak Woodland
Quercus engelmannii	*Quercus engelmannii*/Annual Grass-Herb	71181	Open Engelmann Oak Woodland	COW	Coastal Oak Woodland
Quercus engelmannii	*Quercus engelmannii/Quercus berberidifolia*	71181	Open Engelmann Oak Woodland	COW	Coastal Oak Woodland
Quercus engelmannii	*Quercus engelmannii/Salvia apiana*/Annual Grass-Herb	71181	Open Engelmann Oak Woodland	COW	Coastal Oak Woodland
Quercus engelmannii	*Quercus engelmannii-Quercus agrifolia/Artemisia californica*	71182	Dense Engelmann Oak Woodland	COW	Coastal Oak Woodland
Quercus engelmannii	*Quercus engelmannii-Quercus agrifolia/Chaparral*	71182	Dense Engelmann Oak Woodland	COW	Coastal Oak Woodland
Quercus engelmannii	*Quercus engelmannii-Quercus agrifolia/ Toxicodendron diversilobum*/Annual Grass-Herb	71182	Dense Engelmann Oak Woodland	COW	Coastal Oak Woodland

Alliance	Association	Code	Holland	Code	CWHR
Quercus kelloggii	*Quercus kelloggii*/Annual Grass-Herb	71120, 81340	Black Oak Woodland, Black Oak Forest	MHW	Montane Hardwood
Quercus kelloggii	*Quercus kelloggii-Calocedrus decurrens*	71120, 81340	Black Oak Woodland, Black Oak Forest	MHC	Montane Hardwood - Conifer
Quercus kelloggii	*Quercus kelloggii-Quercus chrysolepis*	71120, 81340	Black Oak Woodland, Black Oak Forest	MHW	Montane Hardwood
Salix gooddingii	*Salix gooddingii/Baccharis salicifolia*	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian
Salix gooddingii	*Salix gooddingii/Lepidium latifolium*	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian
Salix gooddingii	*Salix gooddingii-Salix laevigata*	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian
Salix laevigata	*Salix laevigata/Salix lasiolepis/Artemisia douglasiana*	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian
Shrub Overstory Vegetation					
Acacia greggii	*Acacia greggii*/Annual Grass-Herb	29000	Acacia Scrub	DSW	Desert Wash
Adenostoma fasciculatum	*Adenostoma fasciculatum* (disturbance)	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral
Adenostoma fasciculatum	*Adenostoma fasciculatum* (pure)	37200	Chamise Chaparral	CRC	Chamise-Red Shank Chaparral
Adenostoma fasciculatum-Arctostaphylos glandulosa	*Adenostoma fasciculatum-Arctostaphylos glandulosa-Quercus berberidifolia*	37B00, 37110	Upper Sonoran Manzanita Chaparral, Northern Mixed Chaparral	MCH	Mixed Chaparral
Adenostoma fasciculatum-Arctostaphylos glauca	*Adenostoma fasciculatum-Arctostaphylos glauca*	37B00, 37110	Upper Sonoran Manzanita Chaparral, Northern Mixed Chaparral	MCH	Mixed Chaparral
Adenostoma fasciculatum-Arctostaphylos glauca	*Adenostoma fasciculatum-Arctostaphylos glauca-Quercus berberidifolia*	37B00, 37110	Upper Sonoran Manzanita Chaparral, Northern Mixed Chaparral	MCH	Mixed Chaparral
Adenostoma fasciculatum-Ceanothus greggii	*Adenostoma fasciculatum-Ceanothus greggii*	37400	Semi-Desert Chaparral	MCH	Mixed Chaparral
Adenostoma fasciculatum-Salvia apiana	*Adenostoma fasciculatum-Salvia apiana-Artemisia californica*	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral
Adenostoma fasciculatum-Xylococcus bicolor	*Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus crassifolius-Rhus ovata*	37120	Southern Mixed Chaparral	MCH	Mixed Chaparral

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Adenostoma fasciculatum-Xylococcus bicolor	*Adenostoma fasciculatum-Xylococcus bicolor-Ceanothus verrucosus*	37C30	Southern Maritime Chaparral	MCH	Mixed Chaparral
Adenostoma fasciculatum-Xylococcus bicolor	*Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum*	37120	Southern Mixed Chaparral	MCH	Mixed Chaparral
Adenostoma fasciculatum-Xylococcus bicolor	*Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum-Eriogonum fasciculatum*	37120	Southern Mixed Chaparral	MCH	Mixed Chaparral
Adenostoma fasciculatum-Xylococcus bicolor	*Adenostoma fasciculatum-Xylococcus bicolor-Cneoridium dumosum-Salvia mellifera-Rhus integrifolia*	37C30	Southern Maritime Chaparral	MCH	Mixed Chaparral
Adenostoma fasciculatum-Xylococcus bicolor	*Adenostoma fasciculatum-Xylococcus bicolor-Salvia mellifera-Malosma laurina*	37C30	Southern Maritime Chaparral	MCH	Mixed Chaparral
Arctostaphylos glandulosa	*Arctostaphylos glandulosa*	37520	Montane Manzanita Chaparral	MCH	Mixed Chaparral
Arctostaphylos glauca	*Arctostaphylos glauca*	37520	Montane Manzanita Chaparral	MCH	Mixed Chaparral
Arctostaphylos pringlei	Alliance only	37520	Montane Manzanita Chaparral	MCH	Mixed Chaparral
Artemisia californica	*Artemisia californica*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub
Artemisia californica	*Artemisia californica-Malosma laurina*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub
Artemisia californica-Eriogonum fasciculatum	*Artemisia californica-Eriogonum fasciculatum*	32500, 32700	Diegan Coastal Sage Scrub, Riversidean Sage Scrub	CSC	Coastal Scrub
Artemisia californica-Eriogonum fasciculatum	*Artemisia californica-Eriogonum fasciculatum-Malosma laurina*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub
Artemisia californica-Salvia apiana	*Artemisia californica-Salvia apiana*	32520	Inland Diegan Coastal Sage Scrub	CSC	Coastal Scrub
Artemisia californica-Salvia mellifera	*Artemisia californica-Salvia mellifera-Baccharis sarothroides*	32510	Coastal Diegan Coastal Sage Scrub	CSC	Coastal Scrub
Baccharis pilularis	Alliance only	32110, 32500	Northern Coyote Bush Scrub, Diegan Coastal Sage Scrub	CSC	Coastal Scrub
Baccharis salicifolia	*Baccharis salicifolia*	63310	Mulefat Scrub	FEW	Freshwater Emergent Wetland
Ceanothus crassifolius	*Ceanothus crassifolius*	37830	Ceanothus crassifolius Chaparral	MCH	Mixed Chaparral

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Ceanothus crassifolius	*Ceanothus crassifolius-Adenostoma fasciculatum-Xylococcus bicolor*	37830	Ceanothus crassifolius Chaparral	MCH	Mixed Chaparral
Ceanothus integerrimus	Alliance only	37530, 37531	Montane Ceanothus Chaparral, Deer Brush Chaparral	MCH	Mixed Chaparral
Ceanothus leucodermis	*Ceanothus leucodermis*	37530, 37532	Montane Ceanothus Chaparral, Whitethorn Chaparral	MCH	Mixed Chaparral
Ceanothus oliganthus	*Ceanothus oliganthus-Adenostoma fasciculatum-Xylococcus bicolor*	37120	Southern Mixed Chaparral	MCH	Mixed Chaparral
Ceanothus verrucosus	*Ceanothus verrucosus-Xylococcus bicolor*	37C30	Southern Maritime Chaparral	MCH	Mixed Chaparral
Cercocarpus minutiflorus	Alliance only	37C30	Southern Maritime Chaparral	MCH	Mixed Chaparral
Dendromecon rigida	*Dendromecon rigida*	37G00	Coastal Sage – Chaparral Scrub	MCH	Mixed Chaparral
Encelia californica	*Encelia californica-Artemisia californica*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub
Encelia californica	*Encelia californica-Artemisia californica-Salvia mellifera-Baccharis pilularis*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub
Eriogonum fasciculatum	*Eriogonum fasciculatum*	32500, 32700, 37K00	Diegan Coastal Sage Scrub, Riversidian Sage Scrub, Flat-topped Buckwheat	CSC	Coastal Scrub
Eriogonum fasciculatum	*Eriogonum fasciculatum-Rhus ovata*	37400	Semi-Desert Chaparral	CSC	Coastal Scrub
Eriogonum fasciculatum-Salvia apiana	*Eriogonum fasciculatum-Salvia apiana*	32710	Riversidean Upland Sage Scrub	CSC	Coastal Scrub
Eriogonum wrightii	*Eriogonum wrightii-Lessingia filaginifolia*	39000	Upper Sonoran Subshrub Scrub	CSC	Coastal Scrub
Gutierrezia sarothrae	*Gutierrezia sarothrae-Erodium* sp.*-Nassella pulchra*	39000	Upper Sonoran Subshrub Scrub	CSC	Coastal Scrub
Isocoma menziesii	*Isocoma menziesii* Association	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub
Keckiella antirrhinoides	*Keckiella antirrhinoides-Artemisia californica*	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral
Keckiella antirrhinoides	*Keckiella antirrhinoides*-Mixed chaparral	37G00	Coastal Sage - Chaparral Scrub	MCH	Mixed Chaparral
Lotus scoparius	*Lotus scoparius*	37G00	Coastal Sage - Chaparral Scrub	CSC	Coastal Scrub

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Malosma laurina	*Malosma laurina-Eriogonum fasciculatum*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub
Malosma laurina	*Malosma laurina-Eriogonum fasciculatum-Salvia mellifera*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub
Mesembryanthemum spp. - *Carpobrotus* spp.	*Carbobrotus chilensis-Artemisia californica*	32500	Diegan Coastal Sage Scrub	CSC	Coastal Scrub
Opuntia littoralis	*Opuntia littoralis-Eriogonum fasciculatum-Malosma laurina*	32400	Maritime Succulent Scrub	CSC	Coastal Scrub
Opuntia littoralis	*Opuntia littoralis*-Mixed coastal sage scrub	32400	Maritime Succulent Scrub	CSC	Coastal Scrub
Prosopis glandulosa	*Prosopis glandulosa-Rhus ovata (*Upper desert mesquite spring)	61820	Mesquite Bosque	DRI, DSW	Desert Riparian, Desert Wash
Prunus fremontii	*Prunus fremontii*	37400	Semi-Desert Chaparral	MCH	Mixed Chaparral
Prunus ilicifolia	*Prunus ilicifolia-Heteromeles arbutifolia*	37E00	Mesic North Slope Chaparral	MCH	Mixed Chaparral
Prunus virginiana	Alliance only	37500	Montane Chaparral	MCH	Mixed Chaparral
Quercus berberidifolia	*Quercus berberidifolia*	37900	Scrub Oak Chaparral	MCH	Mixed Chaparral
Quercus berberidifolia	*Quercus berberidifolia-Adenostoma fasciculatum-Arctostaphylos glandulosa*	37110	Northern Mixed Chaparral	MCH	Mixed Chaparral
Quercus berberidifolia-Adenostoma fasciculatum	*Quercus berberidifolia-Adenostoma fasciculatum*	37110	Northern Mixed Chaparral	MCH, CRC	Mixed Chaparral, Chamise-Red Shank Chaparral
Quercus cornelius-mulleri	*Quercus cornelius-mulleri-Eriogonum fasciculatum-Ericameria linearifolia*	37540	Semi-Desert Chaparral	MCH	Mixed Chaparral
Quercus cornelius-mulleri	*Quercus cornelius-mulleri-Rhus ovata*	37540	Semi-Desert Chaparral	MCH	Mixed Chaparral
Quercus wislizeni-Ceanothus leucodermis	Alliance only	37A00, 37510	Interior Live Oak Chaparral, Mixed Montane Chaparral	MCH	Mixed Chaparral
Quercus wislizeni-Quercus berberidifolia	*Quercus wislizeni-Quercus berberidifolia*	37A00, 37540	Interior Live Oak Chaparral, Montane Scrub Oak Chaparral	MCH	Mixed Chaparral
Rhamnus tomentella	Alliance only	37110	Northern Mixed Chaparral	MCH	Mixed Chaparral
Rhus integrifolia	*Rhus integrifolia-Adenostoma fasciculatum-Artemisia californica*	37120	Southern Mixed Chaparral	MCH	Mixed Chaparral
Rhus integrifolia	*Rhus integrifolia-Salvia mellifera-Artemisia californica*	37120	Southern Mixed Chaparral	MCH	Mixed Chaparral
Rhus ovata	*Rhus ovata-Ziziphus parryi*	37540	Semi-Desert Chaparral	MCH	Mixed Chaparral
Rhus trilobata	Alliance only	37500	Montane Chaparral	MCH	Mixed Chaparral

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Rosa californica	Alliance only	63300	Southern Riparian Scrub	VRI	Valley Foothill Riparian
Salix exigua	Alliance only	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian
Salix lasiolepis	*Salix lasiolepis*/*Baccharis salicifolia*	63320	Southern Willow Scrub	VRI	Valley Foothill Riparian
Salvia apiana	*Salvia apiana-Yucca whipplei*	32710	Riversidean Upland Sage Scrub	CSC	Coastal Scrub
Salvia mellifera	*Salvia mellifera*	32000	Coastal Scrub	CSC	Coastal Scrub
Sambucus mexicana	Alliance only	63430	Elderberry Savannah	VRI	Valley Foothill Riparian
Tamarix spp.	Alliance only	63810	Tamarisk Scrub	VRI	Valley Foothill Riparian
Toxicodendron diversilobum	*Toxicodendron diversilobum/Pteridium aquilinum*	37500	Montane Chaparral	MCH	Mixed Chaparral
Viguiera parishii	*Viguiera parishii-Agave deserti*	33220	Sonoran Mixed Woody and Succulent Scrub	DSC	Desert Scrub
Viguiera parishii	*Viguiera parishii-Eriogonum fasciculatum*	33210	Sonoran Mixed Woody Scrub	DSC	Desert Scrub
Herbaceous Vegetation					
Ambrosia psilostachya	*Ambrosia psilostachya-Grindelia hirsutula* var. *hallii*	45100	Montane Meadow	WTM	Wet Meadow
Anemopsis californica	*Anemopsis californica-Juncus mexicanus*	45400	Freshwater Seep	WTM	Wet Meadow
Aristida purpurea	*Aristida purpurea*	42400	Foothill/Mountain Perennial Grassland	PGS	Perennial Grassland
Arundo donax	Alliance only	52410	Coastal and Valley Freshwater Marsh	FEW	Freshwater Emergent Marsh
California Annual Grassland	*Bromus diandrus-Mixed Herb*	42200, 42300	Non-native grassland, Wildflower Field	AGS	Annual Grassland
California Annual Grassland	*Bromus madritensis-Mixed Herb*	42200, 42300	Non-native grassland, Wildflower Field	AGS	Annual Grassland
California Annual Grassland	*Bromus tectorum*	42200, 42300	Non-native grassland, Wildflower Field	AGS	Annual Grassland
Disturbed Temporarily to Seasonally Flooded Grasslands & Forbs	Alliance only	52410	Coastal and Valley Freshwater Marsh	FEW	Freshwater Emergent Marsh

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Juncus balticus-Juncus mexicanus	*Juncus mexicanus*	45400	Freshwater Seep	WTM	Wet Meadow
Juncus effusus	Alliance only	45400	Freshwater Seep	WTM	Wet Meadow
Lepidium latifolium	Alliance only	52410	Coastal and Valley Freshwater Marsh	FEW	Fresh Emergent Wetland
Nassella pulchra	*Nassella pulchra-Erodium* sp.*-Avena barbata*	42110	Valley Needlegrass Grassland	PGS	Perennial Grassland
Salicornia subterminalis	Alliance only	52120	Southern Coastal Salt Marsh	SEW	Saline Emergent Wetland
Salicornia virginica	*Salicornia virginica-Salicornia subterminalis*	52120	Southern Coastal Salt Marsh	SEW	Saline Emergent Wetland
Scirpus californicus - Scirpus acutus	*Scirpus (californicus* and/or *acutus)-Typha*	52410	Coastal and Valley Freshwater Marsh	FEW	Fresh Emergent Wetland
Scirpus californicus - Scirpus acutus	*Scirpus californicus-Scirpus acutus*	52410	Coastal and Valley Freshwater Marsh	FEW	Fresh Emergent Wetland
Selaginella bigelovii	*Selaginella bigelovii-Eriogonum fasciculatum*	39000	Upper Sonoran Subshrub Scrub	CSC	Coastal Scrub
Typha spp.	*Typha latifolia*	52410	Coastal and Valley Freshwater Marsh	FEW	Fresh Emergent Wetland