VEGETATION MAPPING OF THE RANCHO PALOS VERDES NCCP PRESERVE: VEGETATION MAP AND CLASSIFICATION REPORT

Submitted to the
California Department of Fish and Game, South Coast Region

Prepared by the
Palos Verdes Peninsula Land Conservancy
Contact: Lily Verdone

and

California Native Plant Society
Contact: Julie Evens

January 2010

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INTRODUCTION

The Palos Verdes Peninsula Land Conservancy (PVPLC) received grant funding through the California Department of Fish and Game's Local Assistance Grant program to produce a fine-scale, spatially and floristically accurate vegetation map of the Palos Verdes Nature Preserve (PVNP). The PVNP is part of the draft Rancho Palos Verdes Natural Community Conservation Plan (RPV-NCCP) area, and encompasses approximately 1200 acres of protected open space. The PVNP is located in the City of Rancho Palos Verdes, in southern Los Angeles County. The project area represents several biologically rare habitat types, including coastal sage and cactus scrub. In addition, the PVNP hosts several rare and endangered plant and animal species, which are classified as covered species in the RPV-NCCP. Vegetation resources were assessed through field surveys, resulting in the classification analysis of 26 vegetation alliances, 38 vegetation associations or semi-natural stands, and mapping of 583 vegetation map polygons.

BACKGROUND AND OBJECTIVES

The primary objective of this project was to create an accurate baseline vegetation map for the RPV-NCCP. When the NCCP was initially prepared in the late 1990's, floristic information of the area was based on existing surveys, many of which had been prepared for development projects. There was inconsistency in the terminology, level of detail, and scope between the various sources. The initial vegetation maps used in the draft RPV-NCCP were merged from several sources of data, which was adequate at the time. However, they did not provide the level of information that would be most valuable for long-term preserve management. This project has allowed for a detailed, on-the-ground vegetation survey of the PVNP using the California Native Plant Society's Vegetation Rapid Assessment protocol and the latest quantitative classification methods. The resulting vegetation classification follows the Manual of California Vegetation (Sawyer et al. 2009), which is the current standard for interpreting state-wide vegetation patterns and for initiating local and regional ecological assessments. The combination of survey data and the classification of the local vegetation were used to produce a detailed, accurate vegetation map of the PVNP.

To complete the objectives of the project, the PVPLC contracted with the California Native Plant Society (CNPS) to train and assist staff with the PVPN vegetation mapping. CNPS was contracted to perform the following tasks: 1) Provide strategy, protocols, and training for vegetation sampling; 2) Assist with field surveys; 3) Provide training for vegetation mapping and attribution; and, 4) Assist in final reporting and review. CNPS is a state-wide non-profit organization whose mission is to conserve California native plants and their natural habitats, and increase understanding, appreciation, and horticultural use of native plants.

METHODS

The CNPS vegetation rapid assessment protocol was used to survey vegetation types in the PVNP, a nine reserve area in Rancho Palos Verdes, CA (Figure 1). The rapid assessment protocol is a reconnaissance-level method of vegetation and habitat sampling. The quantitative vegetation and habitat data recorded in the field was used to develop a vegetation classification and to provide attributes for mapping using a digital geodatabase and GIS mapping software.

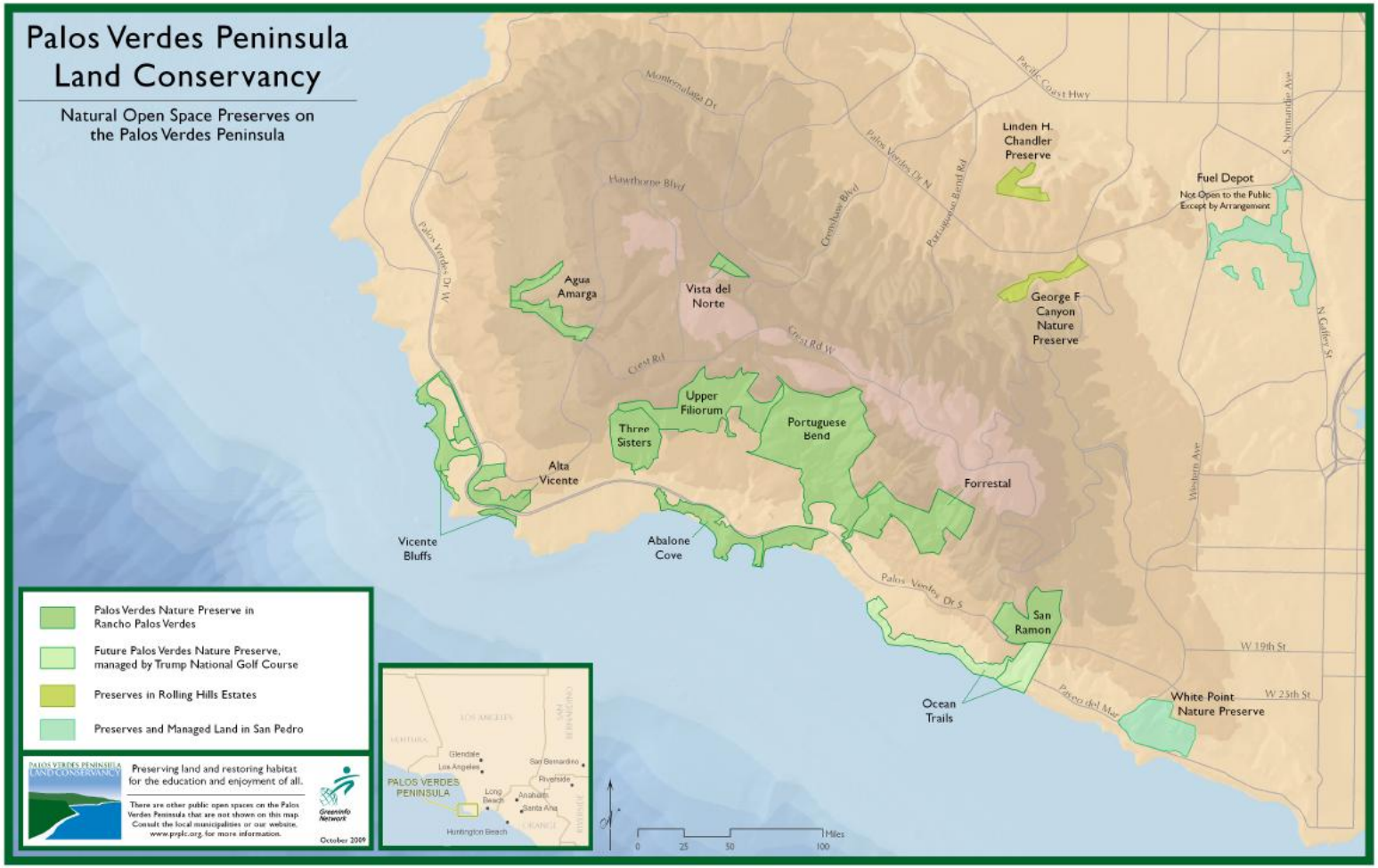

FIGURE 1: LOCATION MAP

A LOCATION MAP OF THE PALOS VERDE PENINSULA, OUTLINING THE PALOS VERDES NATURE PRESERVE AND OTHER LANDS MANAGED BY THE PALOS VERDES PENINSULA LAND CONSERVANCY.

FIELD METHODS

Training in CNPS field sampling protocols was conducted during February 24 -27, 2009, where CNPS biologists trained PVPLC staff and interns on the methodology of Vegetation Rapid Assessment and Relevé sampling methods (CNPS 2007, 2009). The protocols outline vegetation stands as the basic mapping unit. A stand is defined as an area of vegetation that has both compositional and structural integrity and represents a homogenous vegetation type that is repeated across the landscape. Stands can be selected prior to a site visit using aerial photos or other reconnaissance methods, or may be selected on site. Once a stand is selected, a field form is completed (Appendix A) that records both vegetation and environmental data. Plant identification was accomplished using forensic guides for the region as references (Hickman 1993, Sawyer and Keeler-Wolf 1995).

As a result of the field training, a series of mapping rules were established for the project (Table 1). Field vegetation sampling continued through April 2009 by PVPLC staff and interns. During April 7 – 10 and April 28 – May 1, CNPS staff assisted in two additional field survey efforts. Between the two field survey efforts in April, CNPS reviewed the data collected up to that point, and provided additional sampling suggestions, a preliminary key to vegetation types in the PVNP and a list of alliance-level vegetation groups found to date.

CLASSIFICATION ANALYSIS

CNPS staff used multivariate analysis and existing classifications to classify the PVNP field data collected in the spring of 2009. Data was run through a cluster analysis using the PCORD software package to identify patterns and groups in the data. Cluster Analysis with a hierarchical agglomerative technique was employed using Sorenson distance and flexible beta linkage method at -0.25. The cluster analysis was based on species abundance (cover) values converted to 7 different classes as defined in the sampling protocols. The data also were compared to existing classifications in southern California (such as Keeler-Wolf and Evens 2006). An alliance and association level classification resulted, following state and federal standards (see Sawyer and Keeler-Wolf 1995 and NatureServe 2009).

TABLE 1: RULES DEVELOPED FOR MAPPING VEGETATION IN THE PALOS VERDES NATURE PRESERVE TO ENSURE CONSISTENCY AND ACCURACY THROUGHOUT THE PROJECT.

PVNP Vegetation Mapping Rules	
Type	**Specification**
1 Minimum Mapping Unit (MMU)	0.5 acres between vegetation stands
2 Polygon Breaks (other factors)	5 acres for non floristic breaks (clearing - height –other urban features)
	3 acre MMU for polygon break in understory cover
	1 acre MMU for polygon break in overstory cover (including herb layer for herbaceous types)
	Polygon breaks for impact changes of 2 classes differences (high, medium, low)
3 Delineation	Scale of 1:3000 (can vary)
4 Variation in Overstory Shrubs	LYCA-mixed stands with other shrubs (including RHIN) call them LYCA alliance (and LYCA-ENCA association)
	Threshold for the attribution of RHIN vegetation type is 50% relative cover
5 Cover	Typical herbaceous cover classes: 2-9% and 10-39%
	For shrub cover, assess distance for inclusion within stand (use mean separation)
	Distance (MSD) for RHIN is the average separation distance within the stand
6 Non-Native Species	Mark as a disturbance factor for any plot where non-natives are present
	Most plots with herbaceous layer are expected to have non-natives
	Any annual grassland with >66% relative cover of non-native to natives will have high disturbance code
	Any annual grassland with >33-66% cover will have moderate disturbance code
7 Roads and Trails	Base on percent cover of road and/or trail disturbance
	Low = >1-5% cover of disturbance
	Moderate = 6% - 25% cover of disturbance
	High = >25% cover of disturbance
8 Clearing or Grading	Base on percent cover of clearing or grading disturbance
	Low = >1-33% cover of disturbance
	Moderate = 34% - 66% cover of disturbance
	High = >66% cover of disturbance
9 Site Quality	Base site quality rank on additional impacts
	Low = >1-33% cover of disturbance
	Moderate = 34% - 66% cover of disturbance
	High = >66% cover of disturbance
10 Confidence	Applies to any attributes, enter comments to clarify low, medium ranking
11 Field Check	Include Field Check (FC) at the start of comments field when check needed

VEGETATION MAPPING

Post field-data collection, all surveys were entered into a standardized database. Geographical information system (GIS) mapping software was used to digitize the vegetation stands into polygons with individual attributes associated with each polygon stand. To validate the vegetation map, reconnaissance-level field verification was conducted by PVPLC field staff, as directed by CNPS staff. A thorough quality assessment and quality check (QA/QC) was performed in both GIS and the field. Staff visited over 50% of the polygons mapped through both the vegetation rapid assessments and the post mapping field verification to ensure a high degree of floristic and spatial accuracy in the map. The information was stored in an ArcGIS geodatabase. Associated survey information was also stored electronically in tables. Digital photographs of field surveys were archived electronically into folders labeled by survey date.

RESULTS

In the 152 vegetation surveys of the PVNP, 150 vascular plant taxa were identified. General names were used for nonvascular plants or vascular plants not identified to the species level (e.g., Moss, Lichen, Graminoid). Appendix B provides a complete list of scientific and family names for all taxa identified. Appendix C depicts snapshot examples of all the vegetation association or stand types mapped in the PVNP. Appendix D identifies key environmental factors associated with each vegetation rapid assessment plot. Appendix E outlines every rapid assessment plot by vegetation alliance, associate, and property. Appendix F is the vegetation mapping classification created specifically for the PVNP by CNPS. Appendix G provides a summary of species composition and abundance values for vegetation associations/stands identified during the survey of the PVNP. Appendix H is a field key to the floristically defined vegetation types defined and mapped in the region.

The floristic classification for the PVNP includes 28 vegetation alliances (Table 2). Some of the more common native vegetation types found in the PVNP include *Baccharis pilularis* (coyotebrush), *Artemisia californica* (California sagebrush), *Salvia leucophylla* (purple sage), and *Rhus integrifolia* (lemonadeberry), and *Salix lasiolepis* (arroyo willow) alliances. Uncommon vegetation types in the PVNP include: the special stand *Crossosoma californicum* (crossosoma), *Opuntia littoralis* and *Cylindropuntia prolifera* (cactus), *Nassella lepida* (foothill needlegrass), *Leymus condensatus* (giant wildrye), *Hazardia squarrosa* (sawtooth goldenbush) alliances, and all associations including *Eriogonum cinereum* (ashy buckwheat).

Non-native vegetation was commonly identified throughout the PVNP, repeating across the landscape as large, dominant stands, as well as, individual plants within native stands. In general, most herbaceous stands were observed and documented to have an abundance of non-native species such as *Brassica nigra, Bromus* spp., and *Foeniculum vulgare*. Some native species including forbs may occur in these stands, and they may fluctuate seasonally.

Vegetation stands adjacent to urban areas tended to be disturbed by non-native species and other human-level disturbance factors unless the area was sloped and generally inaccessible. In these cases, native vegetation on the slopes was dense and generally undisturbed by non-native species and other human impacts. Another common trend found was that along trails and roads, non-native species were most dense. Rare and covered species were generally found in areas less accessible with limited trails and roads.

TABLE 2: VEGETATION ALLIANCES, ASSOCIATIONS, AND OTHER GROUPS AS MAPPED AND DIGITIZED INTO POLYGONS IN THE PALOS VERDES NATURE PRESERVE.

Vegetation Classification	**# Digitized Polygons**
California Annual and Perennial Grassland Macrogroup	56
California Coastal Scrub Macrogroup	12
Non-Native Tree Vegetation	2
Non-Native/Naturalized Mediterranean Scrub Vegetation	2
Riparian/Wash Scrub and Woodland Macrogroup	2
Agriculture	1
Artificial Road Cuts/Embankments	2
Beach Sand / Dunes	4
Cleared Land	21
Sand / Gravel Bar	2
Sparsely vegetated to non-vegetated	6
Steep Rocky Coastal Slope / Cliff	11
Urban/Disturbed or Built-up	30
Urban–Herbaceous	2
Urban–Shrubs	3
Urban–Trees	2
Water	4
*Acacia cyclops (*or other *acacia)*	21
Artemisia californica (California Sagebrush) Alliance	32
Artemisia californica Association	38
Artemisia californica-Eriogonum cinereum Association	16
Artemisia californica-Opuntia littoralis Association	10
Artemisia californica-Salvia mellifera (California Sagebrush-Black Sage) Alliance	2
Atriplex lentiformis (disturbed) Association	6
Atriplex lentiformis (Quailbush) Alliance	6
Avena (barbata, fatua) (Wild Oats) Stands	1
Baccharis pilularis (Coyotebrush) Alliance	4
Baccharis pilularis- Artemisia californica Association	3
Baccharis pilularis Association	1
Brassica nigra (Black Mustard) Stands	16
Brassica nigra-Bromus diandrus Stands	6
Bromus diandrus, hordeaceus (Ripgut Brome-Soft Chess) Stands	2
Bromus rubens (Red Brome) Stands	2
Carpobrotus edulis (or other iceplants) Stands	5
Crossosoma californicum Special Stands	1
Cylindropuntia prolifera-Mixed Coastal Sage Scrub Association	1

Vegetation Classification	**# Digitized Polygons**
Encelia californica (California Encelia) Alliance	3
Encelia californica Association	9
Encelia californica-Eriogonum cinereum Association	6
Eriogonum cinereum (Ashy Buckwheat) Alliance	8
Eriogonum cinereum Association	11
Eriogonum fasciculatum (California Buckwheat) Alliance	2
Eriogonum fasciculatum Association	1
Eucalyptus (camaldulensis, globulus) Stands	3
Euphorbia terracina (Carnation weed) Stands	3
Foeniculum vulgare (Fennel) Stands	43
Hazardia squarrosa (Sawtooth Goldenbush) Alliance	1
Heteromeles arbutifolia Alliance	1
Heteromeles arbutifolia-Mixed coastal scrub Association	2
Isocoma menziesii (Menzies' Goldenbush) Alliance	1
Leymus condensatus (Giant Wildrye) Alliance	1
Lycium californicum (California Boxthorn) Alliance	2
Lycium californicum- Encelia californica Association	5
Opuntia littoralis (Cylindropuntia spp.) Alliance	1
Opuntia littoralis-Mixed Coastal Sage Scrub Association	8
Pinus spp. (Conifer/Pine) Stands	2
Rhus integrifolia (disturbed) Association	22
Rhus integrifolia (Lemonadeberry) Alliance	12
Rhus integrifolia (strongly dominant) Association	17
Rhus integrifolia-Artemisia californica-Eriogonum cinereum Association	6
Rhus integrifolia-Opuntia littoralis-Eriogonum cinereum Association	4
Salix lasiolepis (disturbed) Association	2
Salix lasiolepis/Baccharis salicifolia Association	1
Salvia leucophylla (Purple Sage) Alliance	6
Salvia leucophylla- Artemisia californica Association	3
Salvia leucophylla Association	4
Salvia leucophylla-Eriogonum cinereum Association	1
Salvia mellifera (Black Sage) Alliance	4
Salvia mellifera Association	4
Salvia mellifera-Eriogonum cinereum-Rhus integrifolia Association	8
Schinus molle, Myoporum laetum Stands	4
Total	**546**

DISCUSSION

The results of this project are a detailed, accurate map of the vegetation in the PVNP. This information can now be used to answer questions ranging from species-specific management to targeting the most likely places to reduce fuel loads. We can now find precise location information for specific habitats of NCCP-covered species, identify areas for conservation within sensitive natural communities and habitats with invasive species, restore habitat value based on various attributes, and create linkages to wildlife habitats through restoration.

As an example, in the short time these data were being finalized, the PVPLC was able use the vegetation map and sampling data to develop a fire recovery plan for a wildfire that occurred on August 27, 2009 in the Portuguese Bend Reserve. The wildfire burned approximately 165 acres within the PVNP and the mapped vegetation stands were used as a pre-fire baseline (Figure 2) for post-fire recovery and restoration.

When considering management issues across the entire PVPNP, it is important to view the land in its entirety and how it functions within the surrounding urban matrix. Approximately 41% of vegetation polygons are adjacent to urban areas (Figure 3). Management activities should be approached with the goal of sustaining native habitat and populations in the context of an urban environment. Invasive species and unauthorized trails appear to the largest threat to preserving intact native vegetation stands in the PVNP.

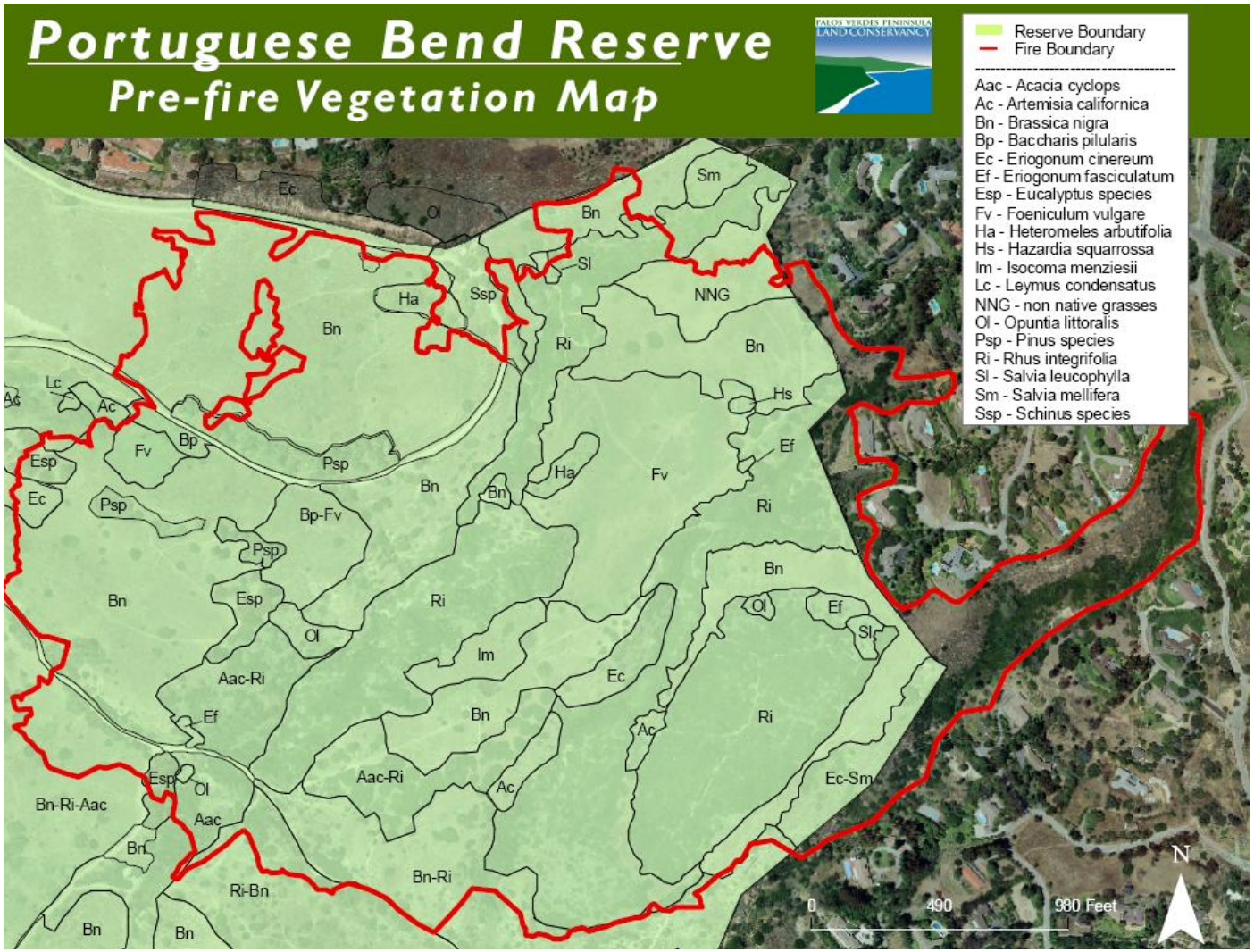

FIGURE 2: AN EXAMPLE APPLICATION OF VEGETATION MAPPING IN THE PORTUGUESE BEND RESERVE, WHERE AN AUGUST 2009 WILDFIRE BURNED 165 ACRES.

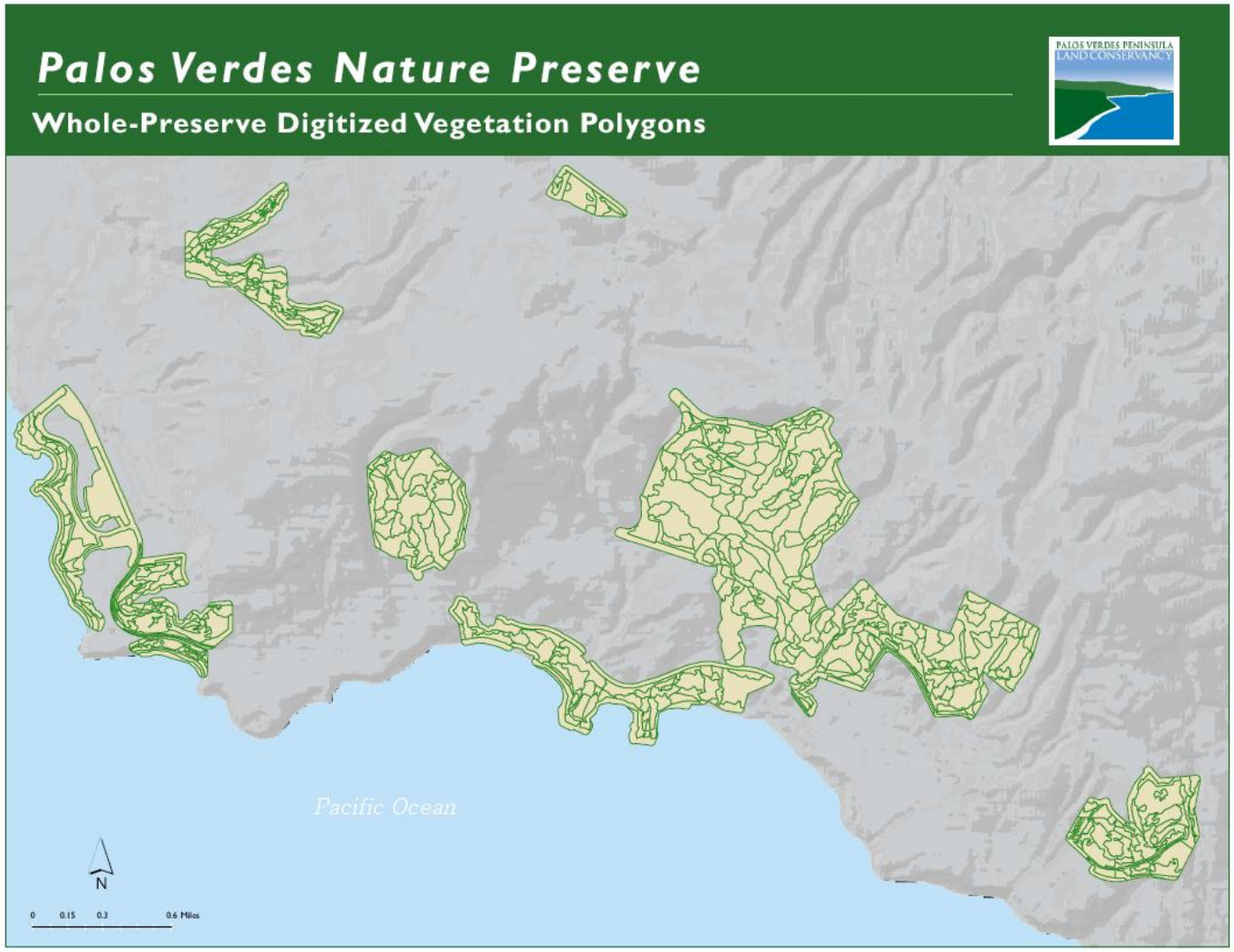

FIGURE 3: A PRESERVE-WIDE MAP DEPICTING ALL DIGITIZED VEGETATION POLYGONS.

Trails occur throughout most of the PVNP, and while multi-use trails are a permitted use, unauthorized social trails result in habitat degradation, species disturbance, and conduits for invasive species movement. It is recommended that enforcement of authorized trail use continue, with an increased focus on unauthorized trail closure, restoration of these disturbed areas and public education through accurate trail signage and interpretive panels.

Invasive species are a ubiquitous problem in wildlands, and are present throughout much of the PVNP. Invasive species pose a substantial threat to the integrity of native vegetation communities in the PVNP. Of particular concern are highly invasive species such as *Euphorbia terracina* (Geraldton carnation spurge) located in Portuguese Bend Reserve and San Ramon, *Ricinus communis* (castor bean) located in Agua Amarga and Abalone Cove, and *Acacia cyclops* (acacia) found through the PVNP. The vegetation surveys and map allow for PVNP staff to prioritize and target areas for restoration.

In addition to the highly invasive species listed, ornamental species located along the many PVNP boundaries are a potential future threat, as their ability to become invasive is unknown. Aggressive non-native plant control is a highly recommended priority for the long-term preservation of established and future recruitment of native vegetation stands in the PVNP. Management priorities should include highly invasive species as listed by the California Invasive Plant Council (Cal-IPC) and the US Department of Agriculture, as well as those already defined by the PVPLC's Targeted Exotic Plant Removal Program for Plants (TERPP).

While the primary purpose of this project was to map and quantify vegetation types in the PVNP, the outcome is the ability to assess and document habitat quality for covered species under the RPV-NCCP. Using the vegetation map, the PVPLC can approach habitat restoration, targeted invasive removal and trail improvement projects systematically, focusing on areas of concern. Projects could include linking island-like stands of native vegetation through habitat restoration or enhancement and increasing the vegetation stand size know nesting sites of covered bird species. As an example, and again referring to the burn area of Portuguese Bend Reserve, recovery efforts have been prioritized by similar principals. Surveyed locations of covered bird populations, California cactus wren (*Campylorhynchus brunneicapillus*) and California gnatchatcher (*Polioptila californica*), were overlaid, using GIS, onto the pre-fire vegetation map. Proposed habitat restoration zones were then delineated based on the bird population locations in relation to vegetation stands. Moreover, the PVPLC will be able to utilize the vegetation map as a baseline for the three-year, 15-acre habitat restoration plan as required by the RPV-NCCP.

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APPENDICES

A. CNPS FIELD FORM

CNPS VEGETATION FIELD FORM FOR SJV and SSNF

Relevé or Rapid Assessment (Circle One) (Revised June 17, 2008)

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

I. LOCATIONAL/ENVIRONMENTAL DESCRIPTION

Polygon/Stand #:	Air photo:	Date:	Name(s) of surveyors (circle recorder):

GPS wypt #: _____ GPS name: _____ Datum: _____ or NAD83. Bearing, left axis at SW pt_____ (degrees) of Long / Short side

UTME ___ ___ ___ ___ ___ ___ UTMN ___ ___ ___ ___ ___ ___ ___ Zone: 10 / 11 (circle one) GPS Error: ±____ ft / m

GPS within stand? Yes / No If No, cite from waypoint to stand, distance _____(meters) & bearing _____(degrees)

Elevation: ft / m Camera/Photograph #'s:

Stand Size (acres): <1, 1-5, >5 | Plot Size (m²): 10 / 100 / 400 / 1000 | Plot Shape ___ x___ ft / m or Circle Radius____ft / m

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

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

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

% Surface cover

H20:____ BA Stems:____ Litter: ____ Bedrock:____ Boulder:____ Stone:____ Cobble: _____ Gravel:____ Fines:_____=100%

(Incl. outcrops) (>60cm diam) (25-60cm) (7.5-25cm) (2mm-7.5cm) (Incl sand, mud)

% Current year bioturbation _____ Past bioturbation present? Y / N | % Hoof punch _____

Site history, stand age, comments:

Type/ Level of disturbance codes: ____/____ ____/____ ____/____ ____/____ ____/____ "Other"

II. HABITAT AND VEGETATION DESCRIPTION

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

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

Herbaceous: H1 (<12" plant ht.), H2 (>12" ht.) % Non-Vasc cover: _____ Total % Vasc Veg cover:_____

% Cover -Overstory Tree Conifer/Hardwood: _____/_____ Low-Medium Tree: _____ Shrub: _____ Herbaceous: _____

Height Class - Overstory Conifer/Hardwood: _____/_____ Low-Medium Tree: _____ Shrub: _____ Herbaceous: _____

Height classes: 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, Stratum, and % cover. Stratum categories: T= Overstory tree, U= Low-Medium Tree, S = Shrub, H= Herb, N= Non-vascular.
% cover intervals for reference: <1%, 1-5%, >5-15%, >15-25%, >25-50%, >50-75%, 75%.

Strata	Species	% cover		Strata	Species	% cover	

Unusual species: _____

III. INTERPRETATION OF STAND

Field-assessed vegetation alliance name: _____

Field-assessed association name (optional): _____

Adjacent alliances: _____

Confidence in alliance identification: L M H Explain: _____

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

B. SPECIES LIST

APPENDIX B

SPECIES LIST AND ASSOCIATED PROPERTY IN PVNP

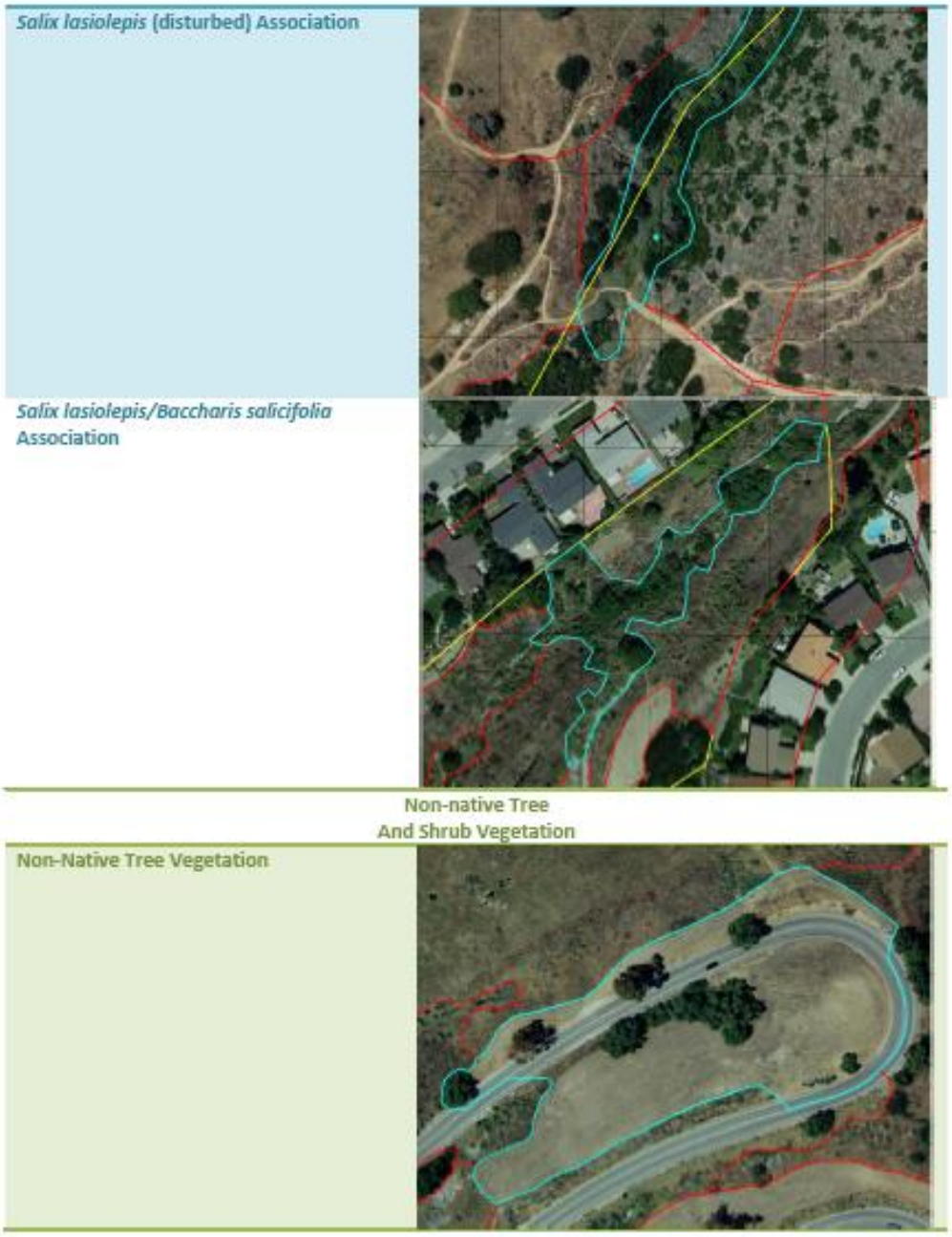
Species Code	Species Name	Property (PVNP Reserve)
ACCY2	*Acacia cyclops A. Cunn. ex G. Don*	Abalone Cove, Alta Vicente, Forrestal, Portuguese Bend, San Ramon, 3 Sisters, Vicente Bluffs, Vista del Norte
ACACI	*Acacia Mill.*	Abalone Cove
ACMI3	*Acourtia microcephala DC.*	Forrestal
AMPU3	*Amblyopappus pusillus Hook. & Arn.*	Abalone Cove, Vicente Bluffs
ARCA11	*Artemisia californica Less.*	Agua Amarga, Abalone Cove, Forrestal, Portuguese Bend, San Ramon, 3 Sisters, Vicente Bluffs, Vista del Norte
ARDO3	*Artemisia douglasiana Besser*	Agua Amarga, Forrestal
ARDO4	*Arundo donax L.*	Portuguese Bend
ASFA	*Asclepias fascicularis Decne.*	Portuguese Bend
ASTR6	*Astragalus trichopodus (Nutt.) A. Gray*	Alta Vicente, Forrestal, San Ramon, Vicente Bluffs
ATCA	*Atriplex californica Moq.*	Vicente Bluffs
ATLE	*Atriplex lentiformis (Torr.) S. Watson*	Abalone Cove, Alta Vicente, Forrestal, Portuguese Bend, San Ramon, 3 Sisters, Vicente Bluffs
ATPA	*Atriplex pacifica A. Nelson*	Abalone Cove, Portuguese Bend
ATSE	*Atriplex semibaccata R. Br.*	Abalone Cove, Vicente Bluffs
AVBA	*Avena barbata Pott ex Link*	San Ramon, Three Sisters
AVFA	*Avena fatua L.*	Agua Amarga, Abalone Cove, Portuguese Bend, San Ramon, Vicente Bluffs
AVENA	*Avena L.*	Agua Amarga, Abalone Cove, Alta Vicente, Portuguese Bend, San Ramon, Three Sisters, Vista del Norte
BAPI	*Baccharis pilularis DC.*	Agua Amarga, Abalone Cove, Forrestal, Portuguese Bend, Vicente Bluffs, Vista del Norte
BASA4	*Baccharis salicifolia (Ruiz & Pav.) Pers.*	Agua Amarga, Forrestal
BRDI2	*Brachypodium distachyon (L.) P. Beauv.*	Abalone Cove, Alta Vicente, Three Sisters
BRNI	*Brassica nigra (L.) W.D.J. Koch*	Agua Amarga, Abalone Cove, Alta Vicente, Forrestal, Portuguese Bend, San Ramon, 3 Sisters, Vicente Bluffs, Vista del Norte
BRDI3	*Bromus diandrus Roth*	Agua Amarga, Abalone Cove, Alta Vicente, Forrestal, Portuguese Bend, San Ramon, 3 Sisters, Vicente Bluffs, Vista del Norte
BRHO2	*Bromus hordeaceus L.*	Abalone Cove, Alta Vicente, Forrestal, Portuguese Bend
BROMU	*Bromus L.*	Portuguese Bend, San Ramon,Vicente Bluffs

C. MAPPED POLYGON SCREEN SHOTS

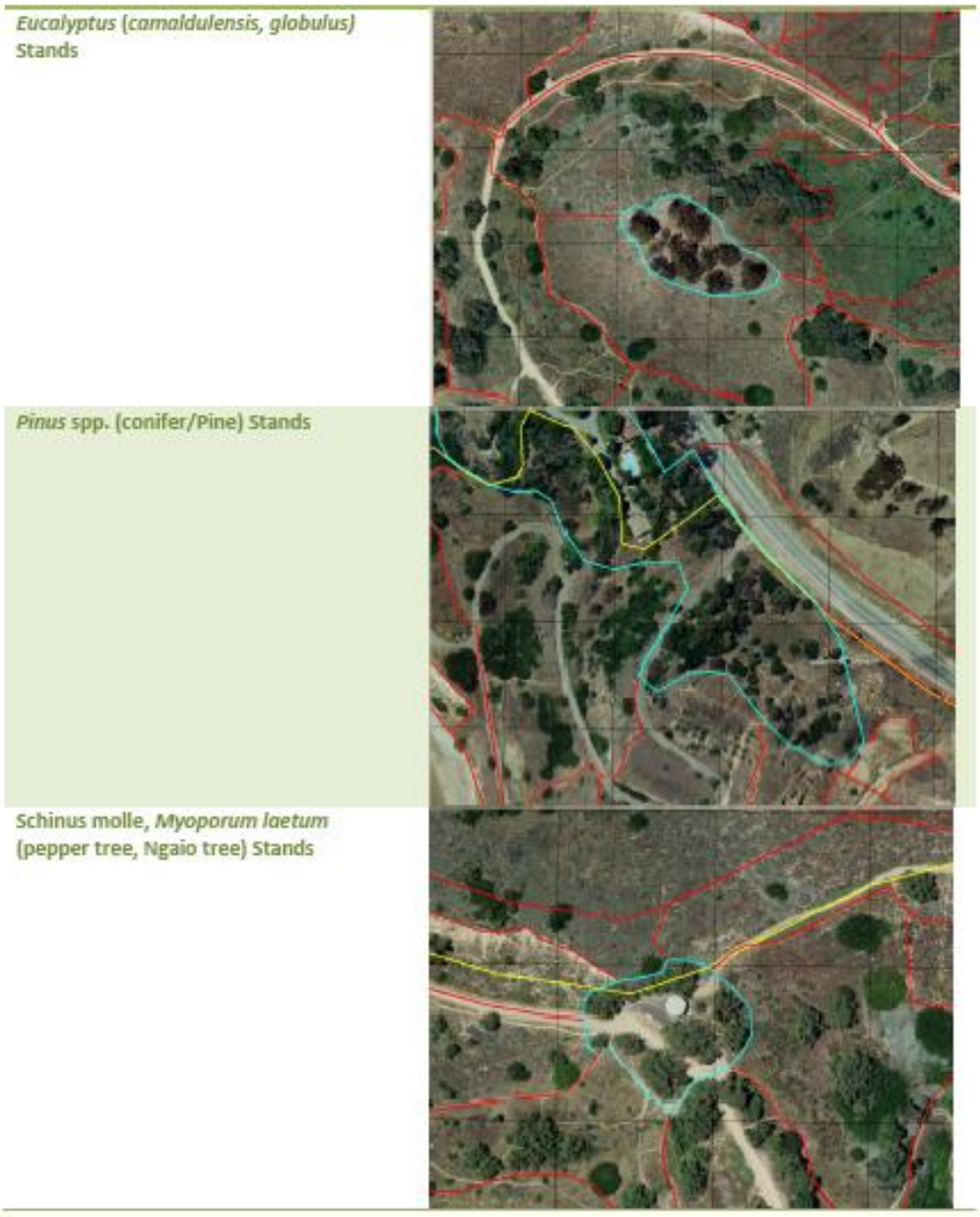
APPENDIX C

VEGETATION STAND EXAMPLES (SCREEN SHOTS)

	Native Riparian Tree And Shrub Vegetation
Riparian Wash/Scrub and Woodland Macrogroup	
Salix lasiolepis (arroyo willow) Alliance	



PVNP VEGETATION MAP AND CLASSIFICATION REPORT



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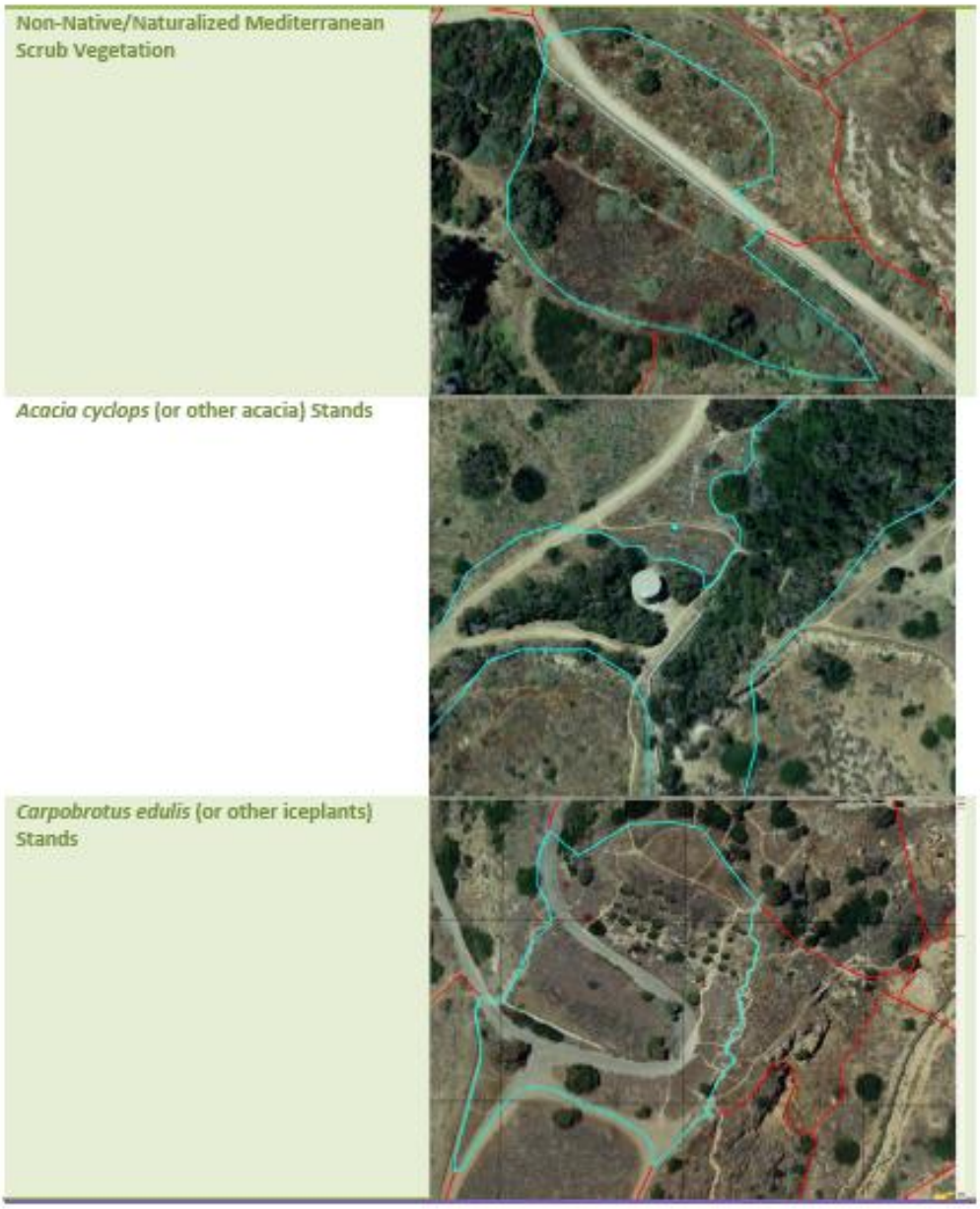

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Native Shrub Vegetation	
Heteromeles arbutifolia (toyon) Alliance	
Heteromeles arbutifolia- Mixed Coastal Sage Scrub Association	
Rhus integrifolia (lemonadeberry) Alliance	

PVNP VEGETATION MAP AND CLASSIFICATION REPORT

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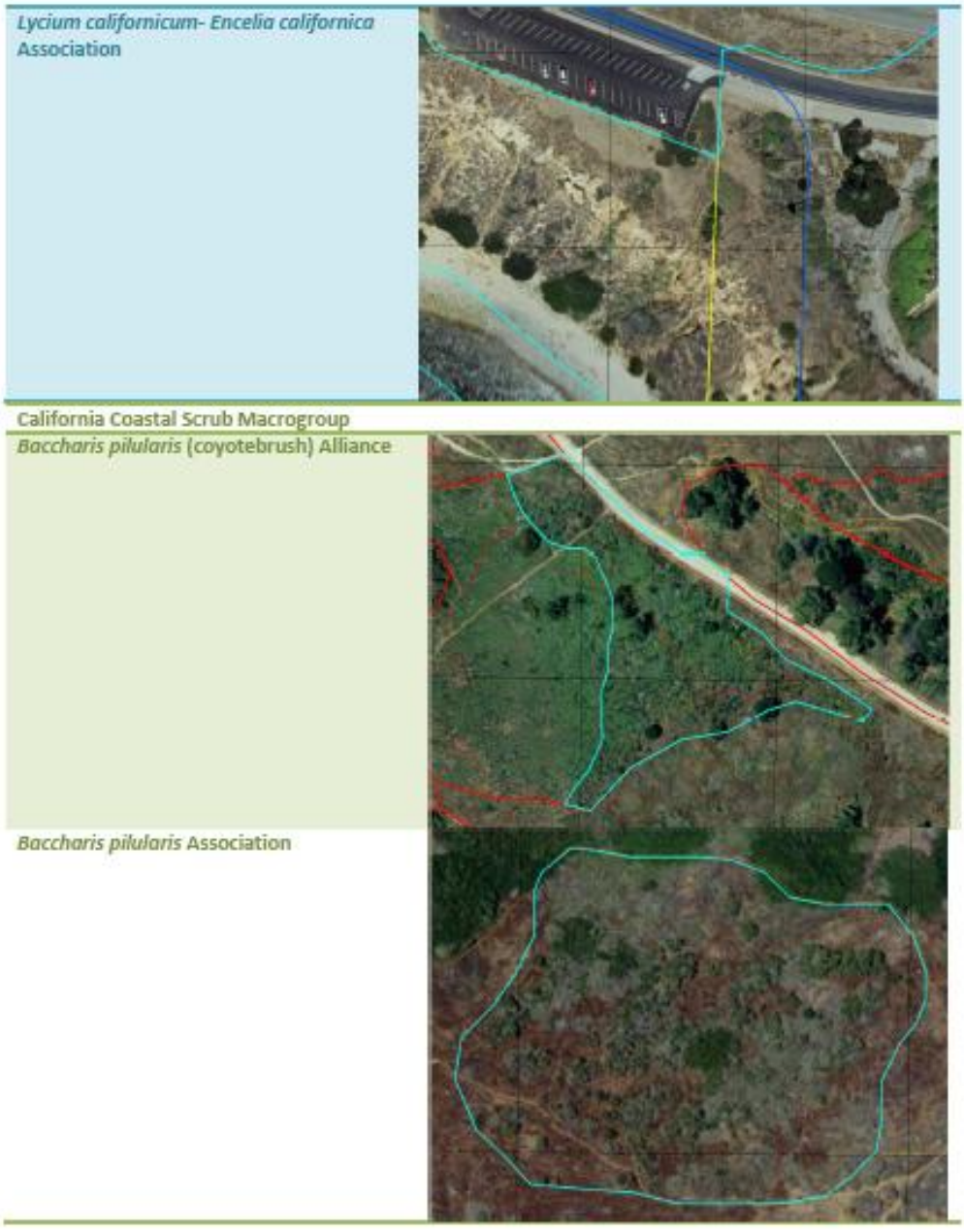
Rhus integrifolia- Artemisia californica-Eriogonum cinereum Association	

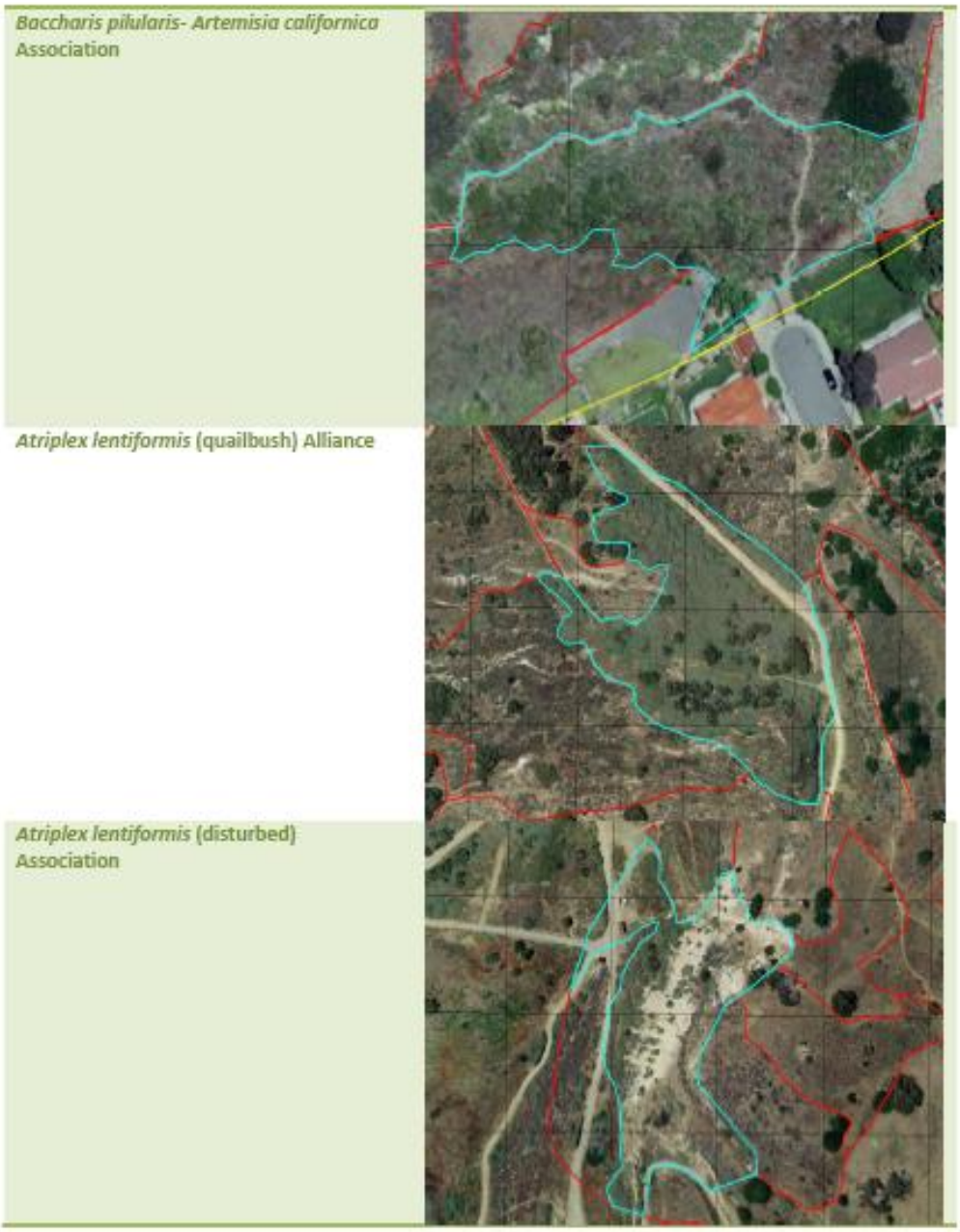
California Succulent/ Desert Scrub Macrogroup	
Opuntia littoralis (*Cylindropuntia* spp.) Cactus Alliance	

***Cylindropuntia prolifera*- Mixed Coastal Sage Scrub Association**	
***Opuntia littoralis*- Mixed Coastal Sage Scrub Association**	
***Lycium californicum* (California boxthorn) Alliance**	

PVNP VEGETATION MAP AND CLASSIFICATION REPORT



PVNP VEGETATION MAP AND CLASSIFICATION REPORT



PVNP VEGETATION MAP AND CLASSIFICATION REPORT

Artemisia californica (California sagebrush) Alliance	
Artemisia californica- Opuntia littoralis Association	
Artemisia californica- Eriogonum cinereum Association	

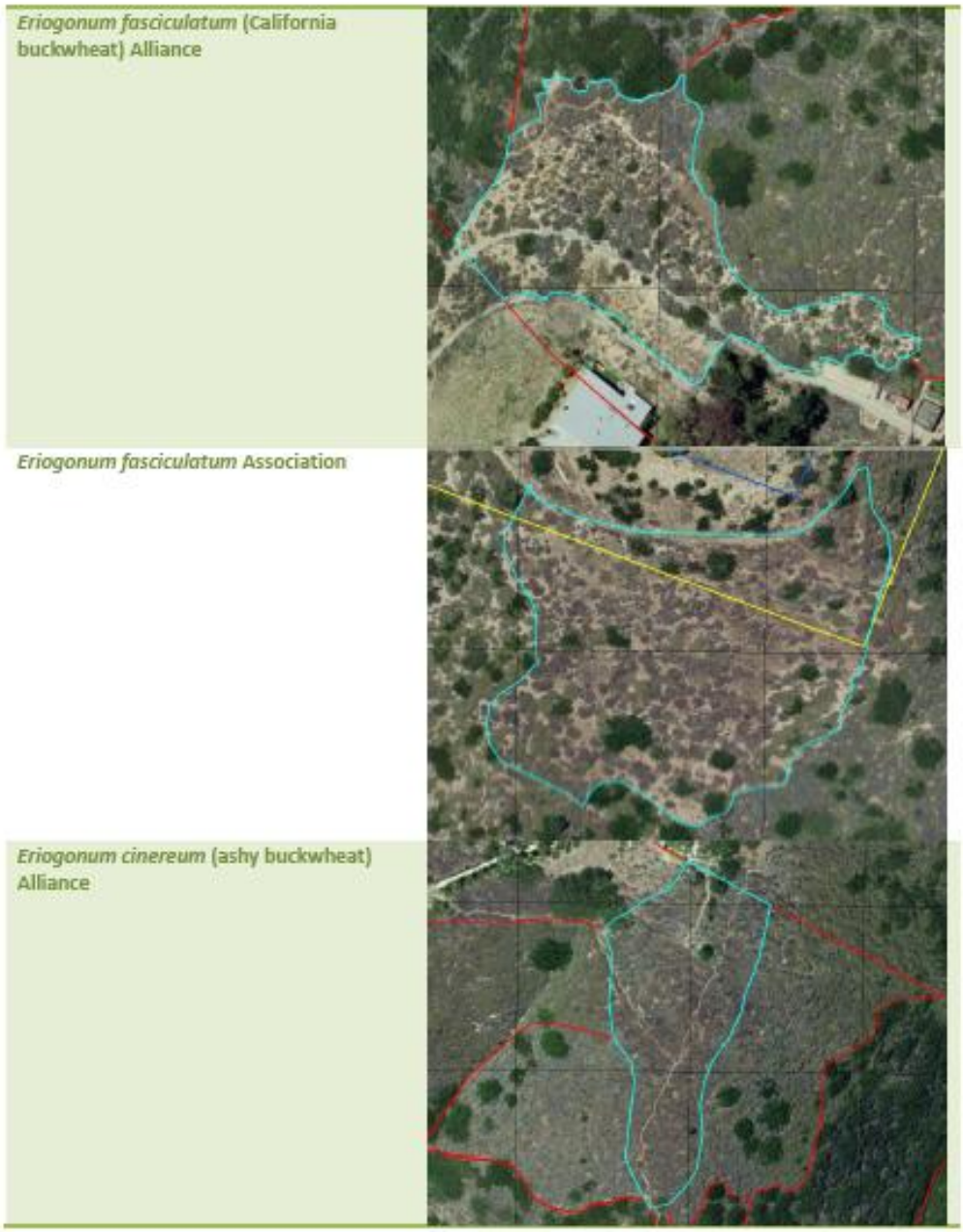
PVNP VEGETATION MAP AND CLASSIFICATION REPORT

Artemisia californica/Leymus condensatus Association	
Artemisia californica Association	
Encelia californica (California encelia) Alliance	

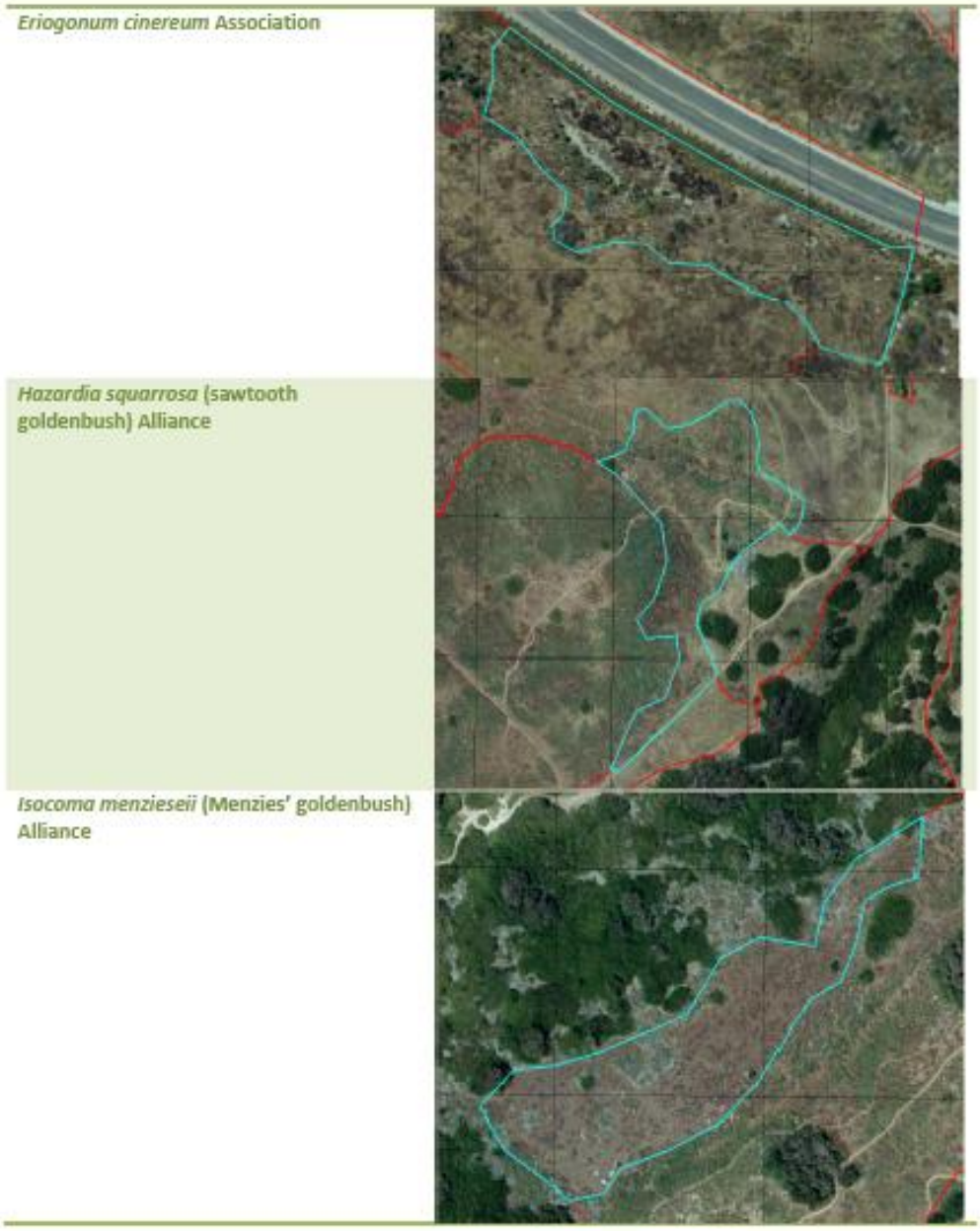
PVNP VEGETATION MAP AND CLASSIFICATION REPORT

Encelia californica Association	
Encelia californica- Artemisia californica Association	
Encelia californica- Eriogonum cinereum Association	

PVNP VEGETATION MAP AND CLASSIFICATION REPORT

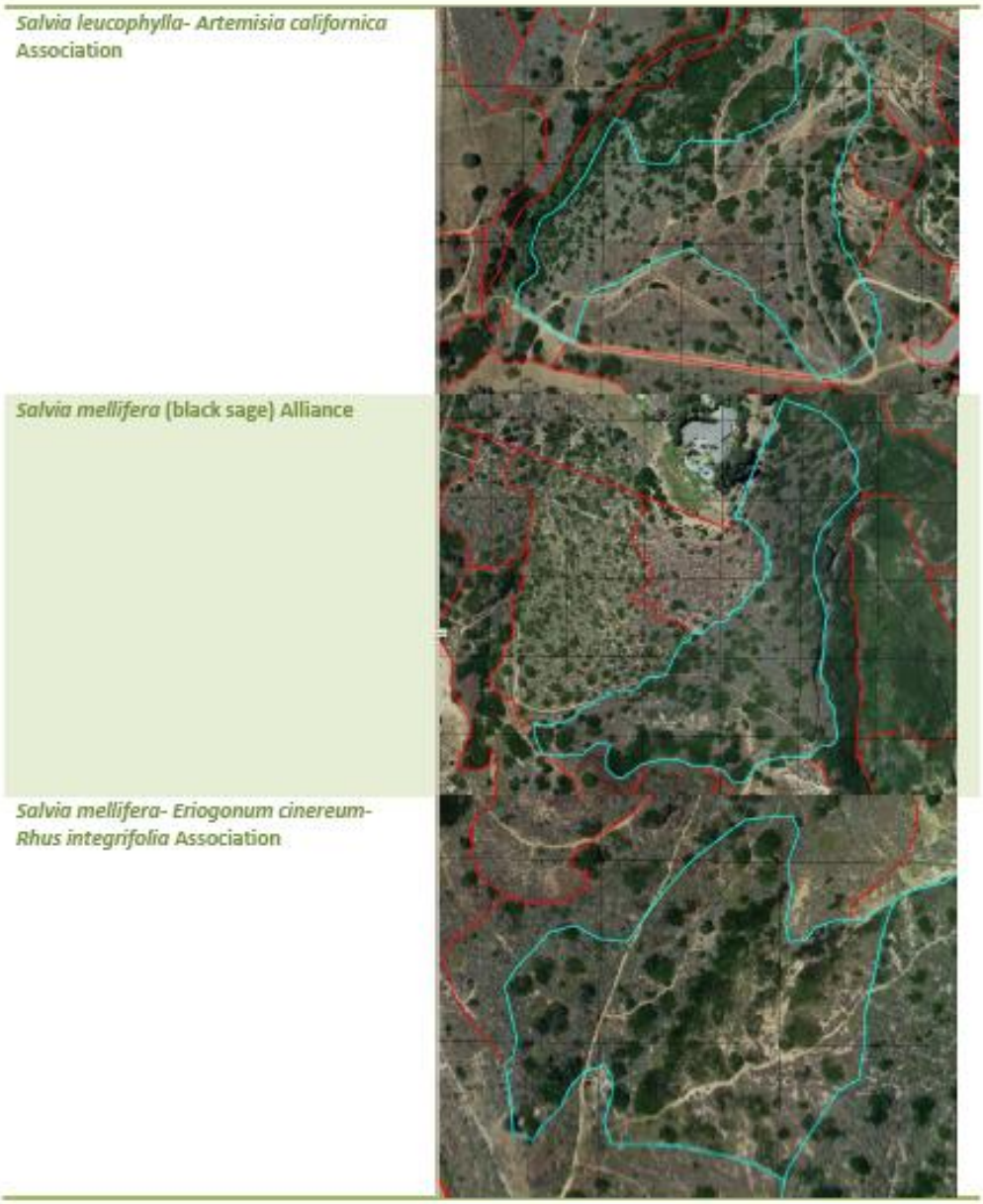


PVNP VEGETATION MAP AND CLASSIFICATION REPORT

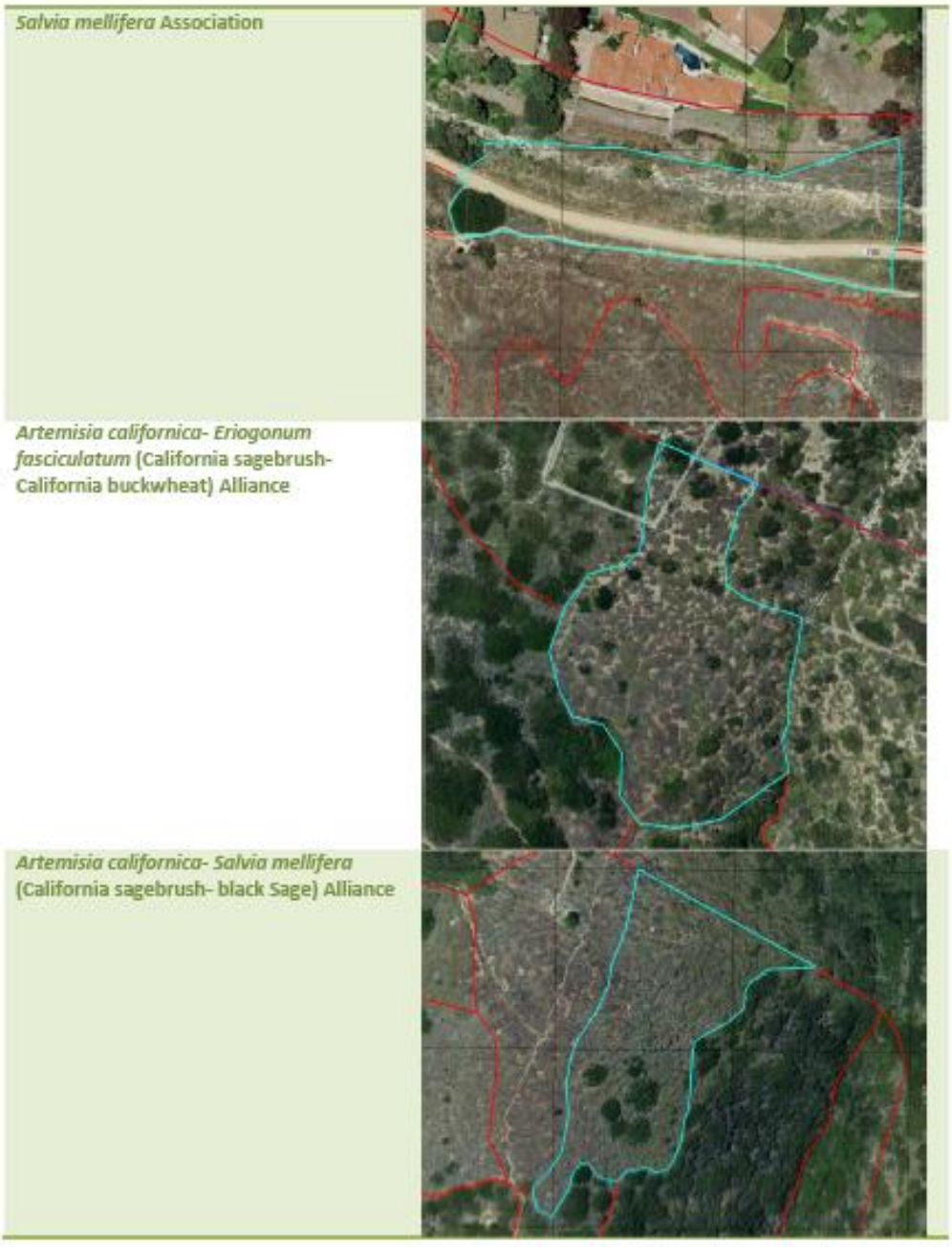


PVNP VEGETATION MAP AND CLASSIFICATION REPORT

PVNP VEGETATION MAP AND CLASSIFICATION REPORT



PVNP VEGETATION MAP AND CLASSIFICATION REPORT

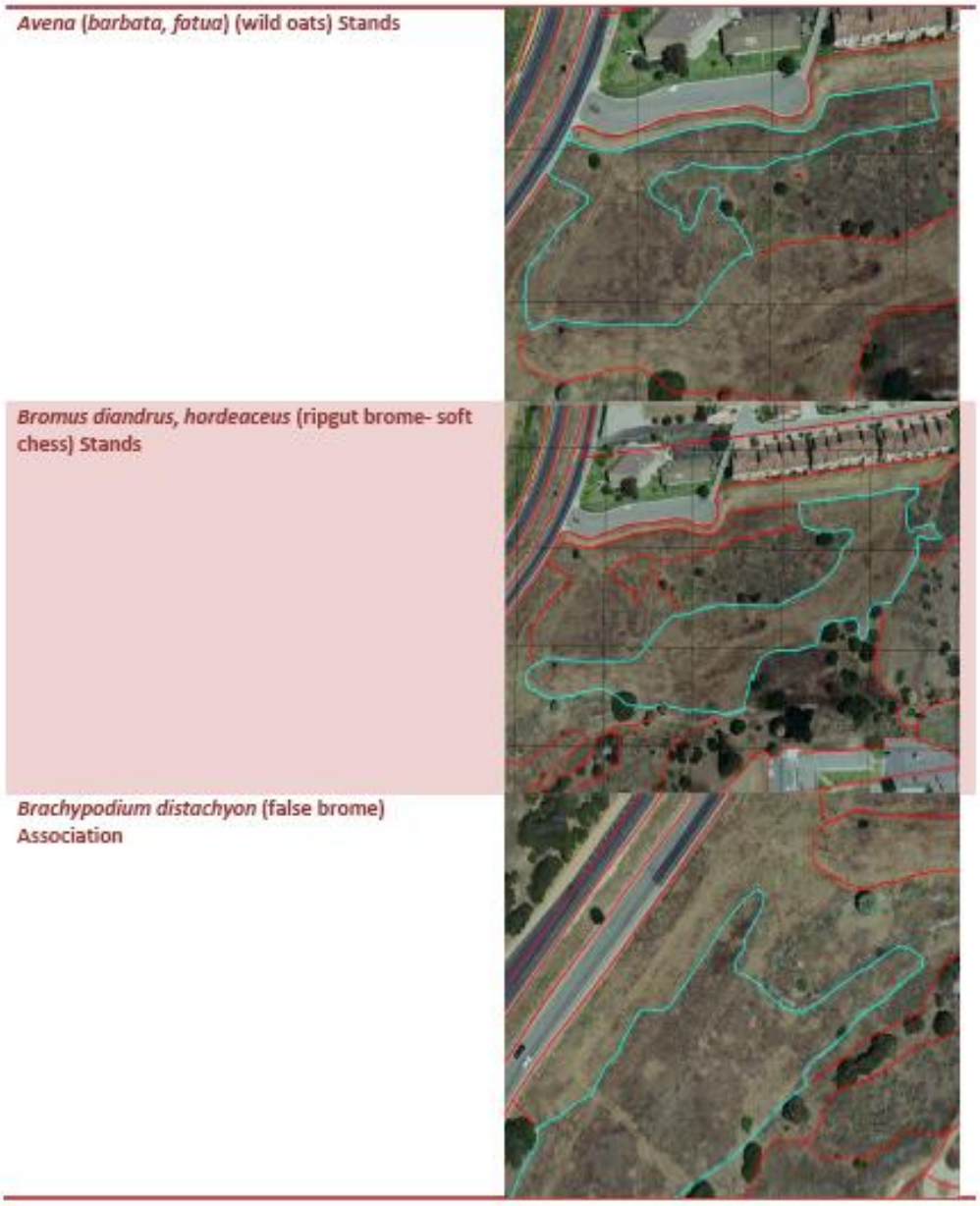


PVNP VEGETATION MAP AND CLASSIFICATION REPORT

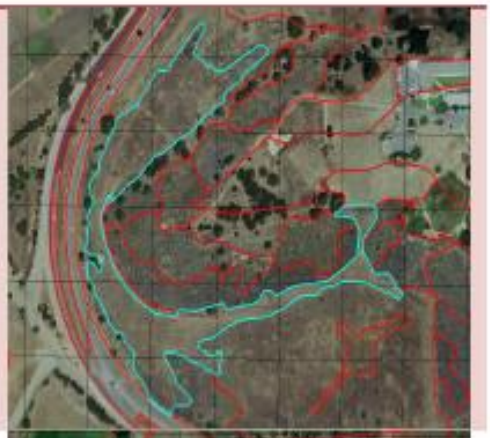

Artemisia californica- Salvia mellifera
Association
Crossosoma californicum (Crossosoma)
Special Stands

Herbaceous Vegetation	
California Annual and Perennial Grassland Macrogroup	
Leymus condensatus (giant wildrye) Alliance	
Nassella lepida (foothill needlegrass) Alliance	

PVNP VEGETATION MAP AND CLASSIFICATION REPORT



PVNP VEGETATION MAP AND CLASSIFICATION REPORT

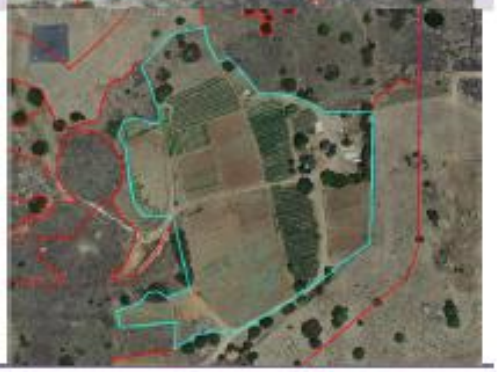
Bromus rubens **(red brome) Stands**	
Brassica nigra **(black mustard) Stands**	
Brassica nigra- Bromus diandrus **(black mustard-ripgut brome) Stands**	

PVNP VEGETATION MAP AND CLASSIFICATION REPORT

PVNP VEGETATION MAP AND CLASSIFICATION REPORT

Steep Rocky Coastal Slope/Cliff	
Cleared Land (not in urban area or not adjacent to land use)	
Beach Sand/Dunes	

Sand/Gravel Bar	
Urban/Disturbed or Built-up	
Urban-Trees (Urban Tree Cover)	

Urban-Shrubs (Native and/or ornamental in urban fringe)	
Urban-Herbaceous (Urban Tree Cover)	
Agriculture (No Vegetation Cover)	

Water (No Vegetation Cover)	
Artificial Road Cuts/Embankments	

D. ENVIRONMENTAL DATA TABLE

APPENDIX D

ENVIRONMENTAL DATA TABLE

Database ID	Property (Reserve)	Alliance	Association	Elevation (m)	Micro Topography	Soil	Soil Type	Aspect Actual	Slope Actual
PVAV0907	Alta Vicente	*Acacia (cyclops, redolens)*	*Acacia cyclops*	43	undulating	MFSA	Moderately fine sandy clay loam		
PVPB0945	Portuguese Bend	*Acacia (cyclops, redolens)*	*Acacia cyclops*	117	undulating	MFCL	Moderately fine clay loam	200	
PVPB0946	Portuguese Bend	*Acacia (cyclops, redolens)*	*Acacia cyclops*	39	flat	MFCL	Moderately fine clay loam		
PVAA0901	Agua Amarga	*Artemisia californica*	*Artemisia californica/Leymus condensatus*	142	undulating	MFCL	Moderately fine clay loam		
PVAA0902	Agua Amarga	*Artemisia californica*	*Artemisia californica-Opuntia littoralis*	241	convex	MFCL	Moderately fine clay loam		
PVAA0903	Agua Amarga	*Artemisia californica*	*Artemisia californica-Opuntia littoralis*	210	undulating	MFCL	Moderately fine clay loam	200	27
PVAA0904	Agua Amarga	*Artemisia californica*	*Artemisia californica/Leymus condensatus*		convex				
PVAA0907	Agua Amarga	*Artemisia californica*	*Artemisia californica/Leymus condensatus*	244	undulating	MFSA	Moderately fine sandy clay loam	305	
PVAV0904	Alta Vicente	*Artemisia californica*	*Artemisia californica-Eriogonum cinereum*	64	flat	MFCL	Moderately fine clay loam		
PVAV0910	Alta Vicente	*Artemisia californica*	*Artemisia californica*	51	flat	MFSL	Moderately fine silty clay loam	250	
PVFR0901	Forrestal	*Artemisia californica*	*Artemisia californica-Eriogonum cinereum*	151	flat	FICL	Fine clay	250	3
PVFR0921	Forrestal	*Artemisia californica*	*Artemisia californica-Eriogonum cinereum*	185	undulating	MFSA	Moderately fine sandy clay loam		
PVPB0901	Portuguese Bend	*Artemisia californica*	*Artemisia californica-Opuntia littoralis*	102	flat	MFCL	Moderately fine clay loam	85	17
PVPB0902	Portuguese Bend	*Artemisia californica*	*Artemisia californica-Opuntia littoralis*	159	concave	MFCL	Moderately fine clay loam		
PVPB0904	Portuguese Bend	*Artemisia californica*	*Artemisia californica-Opuntia littoralis*	128	undulating	MFCL	Moderately fine clay loam	230	
PVPB0906	Portuguese Bend	*Artemisia californica*	*Artemisia californica*	46	flat	MFCL	Moderately fine clay loam		0
PVPB0908	Portuguese Bend	*Artemisia californica*	*Artemisia californica*	47	flat	MFCL	Moderately fine clay loam	16	17
PVPB0909	Portuguese Bend	*Artemisia californica*	*Artemisia californica-Eriogonum cinereum*	313	undulating	MFCL	Moderately fine clay loam	187	32
PVPB0928	Portuguese Bend	*Artemisia californica*	*Artemisia californica-Eriogonum cinereum*	256	undulating	MESI	Medium silt	316	45
PVPB0934	Portuguese Bend	*Artemisia californica*	*Artemisia californica-Eriogonum cinereum*	213	undulating	MFCL	Moderately fine clay loam	172	19
PVSR0901	San Ramon	*Artemisia californica*	*Artemisia californica-Opuntia littoralis*	101	undulating	MFCL	Moderately fine clay loam	194	
PVSR0903	San Ramon	*Artemisia californica*	*Artemisia californica-Opuntia littoralis*	110	flat	MFCL	Moderately fine clay loam	175	
PVSR0907	San Ramon	*Artemisia californica*	*Artemisia californica-Eriogonum cinereum*		concave	MFCL	Moderately fine clay loam		
PVSR0912	San Ramon	*Artemisia californica*	*Artemisia californica-Eriogonum cinereum*	108	undulating	MFCL	Moderately fine clay loam	310	31

Database ID	Property (Reserve)	Alliance	Association	Elevation (m)	Micro Topography	Soil	Soil Type	Aspect Actual	Slope Actual
PVTS0908	Three Sisters	*Artemisia californica*	*Artemisia californica-Opuntia littoralis*	190	undulating	MFCL	Moderately fine clay loam		
PVVB0903	Vicente Bluffs	*Artemisia californica*	*Artemisia californica/Leymus condensatus*	11	flat	MESI	Medium silt		0
PVVN0901	Vista del Norte	*Artemisia californica*	*Artemisia californica*	287	flat	MFCL	Moderately fine clay loam	38	
PVFR0913	Forrestal	*A. californica-Salvia mellifera*	*Artemisia californica-Salvia mellifera*	307	convex	MESI	Medium silt	180	40
PVAC0914	Abalone Cove	*Atriplex lentiformis*	*Atriplex lentiformis* (disturbed)	-20	undulating	MFCL	Moderately fine clay loam	160	
PVAC0915	Abalone Cove	*Atriplex lentiformis*	*Atriplex lentiformis* (disturbed)	-6	undulating	MFCL	Moderately fine clay loam		
PVAC0916	Abalone Cove	*Atriplex lentiformis*	*Atriplex lentiformis* (disturbed)	-20	undulating	MFCL	Moderately fine clay loam		
PVAV0908	Alta Vicente	*Atriplex lentiformis*	*Atriplex lentiformis* (disturbed)	40	flat	MFSL	Moderately fine silty clay loam		1
PVPB0907	Portuguese Bend	*Atriplex lentiformis*	*Atriplex lentiformis* (disturbed)	59	undulating	MFCL	Moderately fine clay loam		
PVPB0922	Portuguese Bend	*Atriplex lentiformis*	*Atriplex lentiformis* (disturbed)	136	undulating	MESI	Medium silt	202	11
PVPB0947	Portuguese Bend	*Avena (barbata, fatua)*	*Avena fatua*	95		MFCL		219	17
PVAA0910	Agua Amarga	*Baccharis pilularis*	*Baccharis pilularis-Artemisia californica*	191	undulating	MFSA	Moderately fine sandy clay loam	261	9
PVAC0908	Abalone Cove	*Baccharis pilularis*	*Baccharis pilularis*	-10	undulating	MFCL	Moderately fine clay loam		
PVFR0907	Forrestal	*Baccharis pilularis*	*Baccharis pilularis*	132	flat	MFCL	Moderately fine clay loam	256	1
PVFR0922	Forrestal	*Baccharis pilularis*	*Baccharis pilularis-Artemisia californica*	169	undulating	MFCL	Moderately fine clay loam		0
PVPB0914	Portuguese Bend	*Baccharis pilularis*	*Baccharis pilularis*	276	flat	FICL	Fine clay	15	7
PVPB0916	Portuguese Bend	*Baccharis pilularis*	*Baccharis pilularis-Artemisia californica*	232	undulating	FICL	Fine clay	180	4
PVVN0904	Vista del Norte	*Baccharis pilularis*	*Baccharis pilularis-Artemisia californica*	271	flat	MFCL	Moderately fine clay loam	28	
PVAA0905	Agua Amarga	*Brassica nigra*	*Brassica nigra-Bromus diandrus*	207	flat	MFCL	Moderately fine clay loam	152	29
PVAV0909	Alta Vicente	*Brassica nigra*	*Brassica nigra-Bromus diandrus*	42	flat	MFSL	Moderately fine silty clay loam	328	4
PVPB0938	Portuguese Bend	*Brassica nigra*	*Brassica nigra-Bromus diandrus*		undulating	MFCL	Moderately fine clay loam		
PVSR0915	San Ramon	*Brassica nigra*	*Brassica nigra-Bromus diandrus*	186	concave	MFCL	Moderately fine clay loam	134	
PVAV0905	Alta Vicente	*Bromus diandrus*	*Brachypodium distachyon*	32	flat	MFSL	Moderately fine silty clay loam	298	3
PVAV0906	Alta Vicente	*Bromus diandrus*	*Brachypodium distachyon*	29	flat			286	3
PVAV0902	Alta Vicente	*Bromus rubens*	*Bromus rubens* - mixed herb	34	flat	MFCL	Moderately fine clay loam	250	0
PVAC0912	Abalone Cove	*Carpobrotus edulis* or other sp.	*Carpobrotus edulis*	18	undulating	MFCL	Moderately fine clay loam	210	24
PVSR0914	San Ramon	*Carpobrotus edulis* or other sp.	*Carpobrotus edulis*	209	convex	MFCL	Moderately fine clay loam	308	33
PVAC0904	Abalone Cove	*Encelia californica*	*Encelia californica*	19	flat	MFSL	Moderately fine silty clay loam	354	6
PVAC0905	Abalone Cove	*Encelia californica*	*Encelia californica-Artemisia californica*	1	flat			172	1

Database ID	Property (Reserve)	Alliance	Association	Elevation (m)	Micro Topography	Soil	Soil Type	Aspect Actual	Slope Actual
PVAC0917	Abalone Cove	*Encelia californica*	*Encelia californica*	5	convex	MFCL	Moderately fine clay loam	152	12
PVAV0901	Alta Vicente	*Encelia californica*	*Encelia californica*	39	flat	MFCL	Moderately fine clay loam	181	2
PVFR0915	Forrestal	*Encelia californica*	*Encelia californica-Eriogonum cinereum*	188	undulating	MFSA	Moderately fine sandy clay loam		40
PVPB0917	Portuguese Bend	*Encelia californica*	*Encelia californica-Artemisia californica*	240	flat	MFCL	Moderately fine clay loam	73	3
PVSR0905	San Ramon	*Encelia californica*	*Encelia californica*	128	flat	MFCL	Moderately fine clay loam	170	
PVSR0908	San Ramon	*Encelia californica*	*Encelia californica-Eriogonum cinereum*		flat	MFCL	Moderately fine clay loam	224	
PVSR0909	San Ramon	*Encelia californica*	*Encelia californica*		convex	MFCL	Moderately fine clay loam	140	
PVSR0913	San Ramon	*Encelia californica*	*Encelia californica*	104	undulating	MFCL	Moderately fine clay loam	162	
PVTS0901	Three Sisters	*Encelia californica*	*Encelia californica-Eriogonum cinereum*	510	undulating	MFSL	Moderately fine silty clay loam	175	16
PVTS0909	Three Sisters	*Encelia californica*	*Encelia californica-Eriogonum cinereum*	221	flat	MFCL	Moderately fine clay loam		
PVTS0910	Three Sisters	*Encelia californica*	*Encelia californica*	216	undulating	MFCL	Moderately fine clay loam	204	23
PVVB0912	Vicente Bluffs	*Encelia californica*	*Encelia californica*	45	flat	MFSA	Moderately fine sandy clay loam	180	34
PVAC0911	Abalone Cove	*Eriogonum cinereum*	*Eriogonum cinereum*	-34	undulating	MESA	Medium to very fine, sandy loam	168	46
PVPB0921	Portuguese Bend	*Eriogonum fasciculatum*	*Eriogonum fasciculatum*	301	flat	MFCL	Moderately fine clay loam	171	12
PVPB0930	Portuguese Bend	*Eriogonum fasciculatum*	*Eriogonum fasciculatum*	158	undulating	MFCL	Moderately fine clay loam	164	24
PVPB0936	Portuguese Bend	*Eucalyptus* sp.	*Eucalyptus* sp.		undulating	MESA	Medium to very fine, sandy loam	218	14
PVPB0937	Portuguese Bend	*Eucalyptus* sp.	*Eucalyptus* sp.	223	undulating	MFCL	Moderately fine clay loam	164	
PVSR0906	San Ramon	*Euphorbia terracina*	*Euphorbia terracina*	166	flat	MFCL	Moderately fine clay loam	214	
PVAA0912	Agua Amarga	*Foeniculum vulgare*	*Foeniculum vulgare*	187	undulating	MFCL	Moderately fine clay loam	230	
PVAA0913	Agua Amarga	*Foeniculum vulgare*	*Foeniculum vulgare*	149	undulating	MFCL	Moderately fine clay loam	240	0
PVPB0939	Portuguese Bend	*Foeniculum vulgare*	*Foeniculum vulgare*		flat	MESA	Medium to very fine, sandy loam	340	
PVPB0944	Portuguese Bend	*Foeniculum vulgare*	*Foeniculum vulgare*	244	flat	MFCL	Moderately fine clay loam		
PVPB0920	Portuguese Bend	*Hazardia squarrosa*	*Hazardia squarrosa*	302	flat	MFSL	Moderately fine silty clay loam	266	17
PVPB0912	Portuguese Bend	*Heteromeles arbutifolia*	*Heteromeles arbutifolia*-Mixed coastal scrub	300	undulating	FICL	Fine clay	222	8
PVPB0923	Portuguese Bend	*Heteromeles arbutifolia*	Heteromeles arbutifolia-Mixed coastal scrub	273	flat	MFCL	Moderately fine clay loam	193	3
PVVN0902	Vista del Norte	*Heteromeles arbutifolia*	*Heteromeles arbutifolia*-Mixed coastal scrub	301	undulating	MFCL	Moderately fine clay loam		
PVVN0903	Vista del Norte	*Heteromeles arbutifolia*	*Heteromeles arbutifolia*-Mixed coastal scrub	270	flat	MFCL	Moderately fine clay loam	28	

Database ID	Property (Reserve)	Alliance	Association	Elevation (m)	Micro Topography	Soil	Soil Type	Aspect Actual	Slope Actual
PVPB0918	Portuguese Bend	*Isocoma menziesii*	*Isocoma menziesii*	209	flat	MFCL	Moderately fine clay loam	288	12
PVAA0909	Agua Amarga	*Leymus condensatus*	*Leymus condensatus*	222	flat	MFSA	Moderately fine sandy clay loam	238	2
PVAA0911	Agua Amarga	*Leymus condensatus*	*Leymus condensatus*	152	convex			350	14
PVPB0935	Portuguese Bend	*Leymus condensatus*	*Leymus condensatus*	233	undulating	MFCL	Moderately fine clay loam	42	18
PVAC0902	Abalone Cove	*Lycium californicum*	*Lycium californicum-Encelia californica*	4	flat	MESA	Medium to very fine, sandy loam		0
PVAC0903	Abalone Cove	*Lycium californicum*	*Lycium californicum-Encelia californica*	4	flat	COLS	Coarse, loamy sand	244	48
PVAC0906	Abalone Cove	*Lycium californicum*	*Lycium californicum-Encelia californica*	31	undulating	MESI	Medium silt	133	46
PVSR0910	San Ramon	*Lycium californicum*	*Lycium californicum-Encelia californica*		flat	MFCL	Moderately fine clay loam	140	
PVVB0901	Vicente Bluffs	*Lycium californicum*	*Lycium californicum-Encelia californica*	14	undulating	MFSA	Moderately fine sandy clay loam	221	41
PVVB0902	Vicente Bluffs	*Lycium californicum*	*Lycium californicum-Encelia californica*	-33	flat	MFCL	Moderately fine clay loam	234	34
PVVB0904	Vicente Bluffs	*Lycium californicum*	*Lycium californicum-Encelia californica*	-9	undulating	MFSA	Moderately fine sandy clay loam		40
PVVB0905	Vicente Bluffs	*Lycium californicum*	*Lycium californicum-Encelia californica*	7	undulating	MFCL	Moderately fine clay loam	260	30
PVVB0906	Vicente Bluffs	*Lycium californicum*	*Lycium californicum-Encelia californica*	19	undulating	MFCL	Moderately fine clay loam	280	46
PVVB0910	Vicente Bluffs	*Lycium californicum*	*Lycium californicum-Encelia californica*	0	undulating	MFCL	Moderately fine clay loam		35
PVVB0911	Vicente Bluffs	*Lycium californicum*	*Lycium californicum-Encelia californica*	23	undulating	MFSA	Moderately fine sandy clay loam	170	40
PVTS0907	Three Sisters	*Nassella lepida*	*Nassella lepida*	141	flat	MFCL	Moderately fine clay loam		
PVAC0907	Abalone Cove	*Opuntia littoralis*	*Opuntia littoralis*-Mixed Coastal Scrub	-19	undulating	MESA	Medium to very fine, sandy loam	238	
PVAV0903	Alta Vicente	*Opuntia littoralis*	*Opuntia littoralis*-Mixed Coastal Scrub	44	flat	MFCL	Moderately fine clay loam	181	17
PVFR0903	Forrestal	*Opuntia littoralis*	*Opuntia littoralis*-Mixed Coastal Scrub	114	convex	MFSA	Moderately fine sandy clay loam	216	22
PVFR0909	Forrestal	*Opuntia littoralis*	*Opuntia littoralis*-Mixed Coastal Scrub	297	flat				
PVFR0910	Forrestal	*Opuntia littoralis*	*Cylindropuntia prolifera*-Mixed Coastal Scrub	297	flat				
PVFR0912	Forrestal	*Opuntia littoralis*	*Opuntia littoralis*-Mixed Coastal Scrub	307	undulating	MFCL	Moderately fine clay loam	160	
PVPB0910	Portuguese Bend	*Opuntia littoralis*	*Opuntia littoralis*-Mixed Coastal Scrub	314	flat	MFSL	Moderately fine silty clay loam	193	29
PVPB0911	Portuguese Bend	*Opuntia littoralis*	*Opuntia littoralis*-Mixed Coastal Scrub	274	convex	MCSL	Moderately coarse, sandy loam	145	24
PVPB0925	Portuguese Bend	*Opuntia littoralis*	*Opuntia littoralis*-Mixed Coastal Scrub	283	flat	MFSA	Moderately fine sandy clay loam	202	27
PVPB0926	Portuguese Bend	*Opuntia littoralis*	*Opuntia littoralis*-Mixed Coastal Scrub	184	undulating	MFCL	Moderately fine clay loam	138	12
PVSR0902	San Ramon	*Opuntia littoralis*	*Opuntia littoralis*-Mixed Coastal Scrub	105	flat	MFCL	Moderately fine clay loam	195	
PVSR0911	San Ramon	*Opuntia littoralis*	*Opuntia littoralis*-Mixed Coastal Scrub		undulating	MFCL	Moderately fine clay loam		
PVTS0906	Three Sisters	*Opuntia littoralis*	*Opuntia littoralis*-Mixed Coastal Scrub	86	concave	MELO	Medium loam		30

Database ID	Property (Reserve)	Alliance	Association	Elevation (m)	Micro Topography	Soil	Soil Type	Aspect Actual	Slope Actual
PVVB0909	Vicente Bluffs	*Opuntia littoralis*	*Cylindropuntia prolifera*-Mixed Coastal Scrub	19	undulating	MESA	Medium to very fine, sandy loam	240	38
PVVB0913	Vicente Bluffs	*Opuntia littoralis*	*Cylindropuntia prolifera*-Mixed Coastal Scrub	48	flat	MFSA	Moderately fine sandy clay loam	184	50
PVAC0913	Abalone Cove	*Pinus* spp. (Conifer)	*Pinus* spp. (Conifer)	30	undulating	MFCL	Moderately fine clay loam		
PVPB0940	Portuguese Bend	*Pinus* spp. (Conifer)	*Pinus* spp. (Conifer)	255	convex	MESA	Medium to very fine, sandy loam		0
PVAA0908	Agua Amarga	*Rhus integrifolia*	*Rhus integrifolia*	218	undulating	MFCL	Moderately fine clay loam	263	17
PVAC0901	Abalone Cove	*Rhus integrifolia*	*Rhus integrifolia*	-30	undulating	MESA	Medium to very fine, sandy loam	290	40
PVAC0909	Abalone Cove	*Rhus integrifolia*	*Rhus integrifolia-A. californica-E. cinereum*	20	undulating	MESA	Medium to very fine, sandy loam	116	38
PVAC0910	Abalone Cove	*Rhus integrifolia*	*Rhus integrifolia-A. californica-E. cinereum*	-23	undulating	MESA	Medium to very fine, sandy loam	170	41
PVFR0902	Forrestal	*Rhus integrifolia*	*Rhus integrifolia*	117	flat	MFCL	Moderately fine clay loam	228	31
PVFR0908	Forrestal	*Rhus integrifolia*	*Rhus integrifolia*	198	flat	MFCL	Moderately fine clay loam	236	14
PVPB0929	Portuguese Bend	*Rhus integrifolia*	*Rhus integrifolia-O. littoralis-E. cinereum*	312	flat	MFCL	Moderately fine clay loam	200	240
PVPB0932	Portuguese Bend	*Rhus integrifolia*	*Rhus integrifolia-O. littoralis-E. cinereum*	185	undulating			152	
PVPB0941	Portuguese Bend	*Rhus integrifolia*	*Rhus integrifolia*	219	undulating				
PVPB0942	Portuguese Bend	*Rhus integrifolia*	*Rhus integrifolia*		undulating	MFCL	Moderately fine clay loam		2
PVPB0943	Portuguese Bend	*Rhus integrifolia*	*Rhus integrifolia*		undulating	MFCL	Moderately fine clay loam	250	3
PVSR0904	San Ramon	*Rhus integrifolia*	*Rhus integrifolia*	125	flat	MFCL	Moderately fine clay loam	165	
PVTS0903	Three Sisters	*Rhus integrifolia*	*Rhus integrifolia* (disturbed)	133	undulating	FICL	Fine clay	190	17
PVTS0904	Three Sisters	*Rhus integrifolia*	*Rhus integrifolia*	122	concave	MFCL	Moderately fine clay loam	158	34
PVTS0905	Three Sisters	*Rhus integrifolia*	*Rhus integrifolia* (disturbed)	117	flat				40
PVVB0907	Vicente Bluffs	*Rhus integrifolia*	*Rhus integrifolia*	-25	undulating	MFCL	Moderately fine clay loam		40
PVVB0908	Vicente Bluffs	*Rhus integrifolia*	*Rhus integrifolia*	12	flat	MFSA	Moderately fine sandy clay loam	282	44
PVVB0914	Vicente Bluffs	*Rhus integrifolia*	*Rhus integrifolia*	8	concave	MCSL	Moderately coarse, sandy loam	214	
PVAA0906	Agua Amarga	*Salix lasiolepis*	*Salix lasiolepis-Baccharis salicifolia*	254	flat	FISA	Fine sandy clay	231	3
PVFR0905	Forrestal	*Salix lasiolepis*	*Salix lasiolepis-Baccharis salicifolia*	203	concave	MFSA	Moderately fine sandy clay loam	195	7
PVFR0917	Forrestal	*Salix lasiolepis*	*Salix lasiolepis* (disturbed)	113	concave	MFSA	Moderately fine sandy clay loam		
PVFR0904	Forrestal	*Salvia leucophylla*	*Salvia leucophylla-Artemisia californica*	129	undulating	MFCL	Moderately fine clay loam		16
PVPB0905	Portuguese Bend	*Salvia leucophylla*	*Salvia leucophylla-Artemisia californica*	130	convex	MFCL	Moderately fine clay loam		

Database ID	Property (Reserve)	Alliance	Association	Elevation (m)	Micro Topography	Soil	Soil Type	Aspect Actual	Slope Actual
PVPB0915	Portuguese Bend	*Salvia leucophylla*	*Salvia leucophylla*	296	undulating	MFSA	Moderately fine sandy clay loam	99	23
PVPB0924	Portuguese Bend	*Salvia leucophylla*	*Salvia leucophylla-Artemisia californica*	151	undulating	MESI	Medium silt	117	6
PVPB0927	Portuguese Bend	*Salvia leucophylla*	*Salvia leucophylla*	303	concave	MFCL	Moderately fine clay loam	279	15
PVPB0931	Portuguese Bend	*Salvia leucophylla*	*Salvia leucophylla-Artemisia californica*	254	undulating	MFSA	Moderately fine sandy clay loam	202	7
PVTS0902	Three Sisters	*Salvia leucophylla*	*Salvia leucophylla*	134	undulating	MFCL	Moderately fine clay loam	196	22
PVFR0906	Forrestal	*Salvia mellifera*	*Salvia mellifera-E. cinereum-R. integrifolia*	203	undulating	MFCL	Moderately fine clay loam	205	29
PVFR0911	Forrestal	*Salvia mellifera*	*Salvia mellifera-E. cinereum-R. integrifolia*	297	flat			110	35
PVFR0914	Forrestal	*Salvia mellifera*	*Salvia mellifera-E. cinereum-R. integrifolia*	264	concave	MESA	Medium to very fine, sandy loam	200	
PVFR0919	Forrestal	*Salvia mellifera*	*Salvia mellifera-E. cinereum-R. integrifolia*	218	convex	MFCL	Moderately fine clay loam	252	20
PVPB0903	Portuguese Bend	*Salvia mellifera*	*Salvia mellifera*	115	convex	MFCL	Moderately fine clay loam	219	30
PVPB0913	Portuguese Bend	*Salvia mellifera*	*Salvia mellifera*	311	convex	MFCL	Moderately fine clay loam	210	17
PVPB0933	Portuguese Bend	*Salvia mellifera*	*Salvia mellifera-E. cinereum-R. integrifolia*	268	convex	MFCL	Moderately fine clay loam	243	33
PVFR0916	Forrestal	Unclassified bluff/slope	Steep bluff/slope (*Eriogonum-Encelia*)	171	flat	MCSL	Moderately coarse, sandy loam	230	32
PVFR0920	Forrestal	Unclassified bluff/slope	Steep bluff/slope (*Eriogonum-Encelia*)	273	concave	MFSA	Moderately fine sandy clay loam	203	30
PVVB0915	Vicente Bluffs	Unclassified bluff/slope	Steep bluff/slope (*Eriogonum-Encelia*)	16	flat	MFCL	Moderately fine clay loam	350	45
PVFR0918	Forrestal	Unclassified herbaceous	Unclassified herbaceous	227	flat	MFSA	Moderately fine sandy clay loam		

E. RAPID ASSESSMENT PLOT DATA

APPENDIX E

RAPID ASSESSMENT PLOTS QUANTIFIED BY ALLIANCE AND ASSOCIATION

Alliance	# of RAs	Association	# of RAs	Properties (Reserve)
Acacia (cyclops, redolens)	3	*Acacia cyclops*	3	Alta Vicente, Portuguese Bend
Artemisia californica	24	*Artemisia californica*	4	Agua Amarga, Alta Vicente, Forrestal, Portuguese Bend, San Ramon, Three Sisters, Vicente Bluffs, Vista del Norte
		Artemisia californica/Leymus condensatus	4	
		Artemisia californica-Eriogonum cinereum	8	
		Artemisia californica-Opuntia littoralis	8	
Artemisia californica-Salvia mellifera	1	*Artemisia californica-Salvia mellifera*	1	Forrestal
Atriplex lentiformis	6	*Atriplex lentiformis* (disturbed)	6	Abalone Cove, Alta Vicente, Portuguese Bend
Avena (barbata, fatua)	1	*Avena fatua*	1	Portuguese Bend
Baccharis pilularis	7	*Baccharis pilularis*	3	Agua Amarga, Abalone Cove, Forrestal, Portuguese Bend, Vista del Norte
		Baccharis pilularis-Artemisia californica	4	
Brassica nigra	4	*Brassica nigra-Bromus diandrus*	4	Agua Amarga, Alta Vicente, Portuguese Bend, San Ramon
Bromus diandrus	2	*Brachypodium distachyon*	2	Alta Vicente
Bromus rubens	1	*Bromus rubens* - mixed herb	1	Alta Vicente
Carpobrotus edulis or other iceplant	2	*Carpobrotus edulis*	2	Abalone Cove, San Ramon
Encelia californica	14	*Encelia californica*	8	Abalone Cove, Alta Vicente, Forrestal, Portuguese Bend, San Ramon, Three Sisters, Vicente Bluffs
		Encelia californica-Artemisia californica	2	
		Encelia californica-Eriogonum cinereum	5	
Eriogonum cinereum	1	*Eriogonum cinereum*	1	Abalone Cove
Eriogonum fasciculatum	2	*Eriogonum fasciculatum*	2	Portuguese Bend
Eucalyptus sp.	2	*Eucalyptus* sp.	2	Portuguese Bend
Euphorbia terracina	1	*Euphorbia terracina*	1	San Ramon
Foeniculum vulgare	4	*Foeniculum vulgare*	4	Agua Amarga, Portuguese Bend
Hazardia squarrosa	1	*Hazardia squarrosa*	1	Portuguese Bend
Heteromeles arbutifolia	4	*Heteromeles arbutifolia*-Mixed coastal scrub	4	Portuguese Bend, Vista del Norte
Isocoma menziesii	1	*Isocoma menziesii*	1	Portuguese Bend
Leymus condensatus	3	*Leymus condensatus*	3	Agua Amarga, Portuguese Bend

Alliance	**# of RAs**	**Association**	**# of RAs**	**Properties (Reserve)**
Lycium californicum	11	*Lycium californicum-Encelia californica*	11	Abalone Cove, San Ramon, Vicente Bluffs
Nassella lepida	1	*Nassella lepida*	1	Three Sisters
Opuntia littoralis	15	*Opuntia littoralis*-Mixed Coastal Scrub	12	Abalone Cove, Alta Vicente, Forrestal, Portuguese Bend, San Ramon, Three Sisters, Vicente Bluffs
		Cylindropuntia prolifera-Mixed Coastal Scrub	3	
Pinus spp. (Conifer)	2	*Pinus* spp. (Conifer)	2	Abalone Cove, Portuguese Bend
Rhus integrifolia	18	*Rhus integrifolia*	12	Agua Amarga, Abalone Cove, Forrestal, Portuguese Bend, San Ramon, Three Sisters, Vicente Bluffs
		Rhus integrifolia (disturbed)	2	
		Rhus integrifolia-Artemisia californica-Eriogonum cinereum	1	
		Rhus integrifolia-Opuntia littoralis-Eriogonum cinereum	3	
Salix lasiolepis	3	*Salix lasiolepis* (disturbed)	1	Agua Amarga, Forrestal
		Salix lasiolepis-Baccharis salicifolia	2	
Salvia leucophylla	7	*Salvia leucophylla*	3	Forrestal, Portuguese Bend, Three Sisters
		Salvia leucophylla-Artemisia californica	4	
Salvia mellifera	7	*Salvia mellifera*	2	Forrestal, Portuguese Bend
		Salvia mellifera-Eriogonum cinereum-Rhus integrifolia	5	
Unclassified bluff/slope	3	Steep bluff/slope (*Eriogonum-Encelia*)	2	Vicente Bluffs
Unclassified herbaceous	1	Unclassified herbaceous	1	Forrestal
***RA: Rapid Assessment Vegetation Mapping**				

F. VEGETATION MAPPING CLASSIFICATION

APPENDIX F

VEGETATION MAPPING CLASSIFICATION WITH CODES AND NAMES

Native Riparian Tree and Shrub Vegetation

1414 = Riparian/Wash Scrub and Woodland Macrogroup
1430 = *Salix lasiolepis* (Arroyo Willow) Alliance
- **1431 = *Salix lasiolepis* (disturbed) Association**
- **1432 = *Salix lasiolepis/Baccharis salicifolia* Association**

Non-native Tree and Shrub Vegetation

9500 = Non-Native Tree Vegetation (In the wild, non-urban) (Code Vegetation Cover)(Urban Tree Code NA = 9)
- **9510 = Eucalyptus (*camaldulensis, globulus*) Stands**
- **9520 = *Pinus* spp. (Conifer/Pine) Stands**
- **9550 = *Schinus molle, Myoporum laetum* (Pepper, Ngaio Tree) Stands**

9540 = Non-Native/Naturalized Mediterranean Scrub Vegetation
- **9541 = *Acacia cyclops* (or other acacia) Stands**
- **9543 = *Carpobrotus edulis* (or other iceplants) Stands**

Native Shrub Vegetation

2000 = California Chaparral Macrogroup
2130 = *Heteromeles arbutifolia* (Toyon) Alliance
- **2131 = *Heteromeles arbutifolia*-Mixed coastal scrub Association**

2150 = *Rhus integrifolia* (Lemonadeberry) Alliance
- **2151 = *Rhus integrifolia-Opuntia littoralis-Eriogonum cinereum* Association**
- **2152 = *Rhus integrifolia* (disturbed) Association**
- **2153 = *Rhus integrifolia* (strongly dominant) Association**
- **7157 = *Rhus integrifolia-Artemisia californica-Eriogonum cinereum* Association**

2400 = California Succulent/Desert Scrub Macrogroup
2410 = *Opuntia littoralis* (*Cylindropuntia* spp.) Cactus Alliance
- **2411 = *Cylindropuntia prolifera*-Mixed Coastal Sage Scrub Association**
- **2412 = *Opuntia littoralis*-Mixed Coastal Sage Scrub Association**

2420 = *Lycium californicum* (California Boxthorn) Alliance
- **2421 = *Lycium californicum- Encelia californica* Association**

3000 = California Coastal Scrub Macrogroup
2310 = *Baccharis pilularis* (Coyotebrush) Alliance
- **2311 = *Baccharis pilularis* Association**
- **2313 = *Baccharis pilularis- Artemisia californica* Association**

2330 = *Atriplex lentiformis* (Quailbush) Alliance
- **2331 = *Atriplex lentiformis* (disturbed) Association**

3210 = *Artemisia californica* (California Sagebrush) Alliance
- **3212 = *Artemisia californica-Opuntia littoralis* Association**
- **3214 = *Artemisia californica-Eriogonum cinereum* Association**
- **3216 = *Artemisia californica/Leymus condensatus* Association**
- **8213 = *Artemisia californica* Association**

3220 = *Encelia californica* (California Encelia) Alliance
- **3222 = *Encelia californica* Association**
- **3227 = *Encelia californica-Artemisia californica* Association**
- **3225 = *Encelia californica-Eriogonum cinereum* Association**

3240 = *Eriogonum fasciculatum* (California Buckwheat) Alliance
- **3241 = *Eriogonum fasciculatum* Association**

3250 = *Eriogonum cinereum* (Ashy Buckwheat) Alliance
- **3257 = *Eriogonum cinereum* Association**

3260 = *Hazardia squarrosa* (Sawtooth Goldenbush) Alliance
- **3261 = *Hazardia squarrosa* Association**

3290 = *Isocoma menziesii* (Menzies' Goldenbush) Alliance
- **3291 = *Isocoma menziesii* Association**

3310 = *Salvia leucophylla* (Purple Sage) Alliance
- **3312 = *Salvia leucophylla-Eriogonum cinereum* Association**
- **3316 = *Salvia leucophylla* Association**
- **3391 = *Salvia leucophylla- Artemisia californica* Association**

3320 = *Salvia mellifera* (Black Sage) Alliance
- **3323 = *Salvia mellifera-Eriogonum cinereum-Rhus integrifolia* Association**

3324 = *Salvia mellifera* Association
3370 = *Artemisia californica-Eriogonum fasciculatum* (California Sagebrush-California Buckwheat) Alliance
3420 = *Artemisia californica-Salvia mellifera* (California Sagebrush-Black Sage) Alliance
3421 = *Artemisia californica-Salvia mellifera* Association
3430 = *Crossosoma californicum* (Crossosoma) Special Stands

Herbaceous Vegetation

4000 = California Annual and Perennial Grassland Macrogroup
4040 = *Leymus condensatus* (Giant Wildrye) Alliance
4090 = *Nassella lepida* (Foothill Needlegrass) Alliance
4220 = *Avena (barbata, fatua*) (Wild Oats) Stands
4230 = *Bromus diandrus, hordeaceus* (Ripgut Brome-Soft Chess) Stands
4231 = *Brachypodium distachyon* (False Brome) Association
4240 = *Bromus rubens* (Red Brome) Stands
4250 = *Brassica nigra* (Black Mustard) Stands
4251 = *Brassica nigra-Bromus diandrus* (Black Mustard-Ripgut Brome) Stands
4770 = *Euphorbia terracina* (Carnation weed) Stands
4760 = *Foeniculum vulgare* (Fennel) Stands

Miscellaneous Classes

9000 = Sparsely vegetated to non-vegetated
9001 = SP Steep Rocky Coastal Slope / Cliff
9003 = SP Cleared Land
9005 = SP Beach Sand / Dunes
9006 = SP Sand / Gravel Bar

9100 = Urban/Disturbed or Built-up
9101 = Urban–Trees
9102 = Urban–Shrubs
9103 = Urban–Herbaceous

9200 = Agriculture

9400 = SP Water

9600 = SP Artificial Road Cuts/Embankments

Vegetation Cover

1 = < 2
2 = 2-10%
3 = 10-39%
4 = 40-59%
5 = 60-100%
9 = Not applicable

Urban Tree Cover

1 = Low
2 = Medium
3 = High
9 = Not Applicable

Created by CNPS, 2009

G. SPECIES COMPOSITION/ABUNDANCE TABLES FOR VEGETATION TYPES

APPENDIX G

SPECIES COMPOSITION/ABUNDANCE TABLES FOR THE VEGETATION TYPES

The PVNP association and stand types are summarized within five species composition/abundance tables (1-5). The table below provides codes that are used to identify each vegetation type, as well as the species composition/abundance table for which it can be found. Each species composition/abundance table includes the number of stands sampled under the code for the vegetation type. Each table also includes abundance and frequency values for those plants that occur at 33% or greater constancy across all stands sampled for each type. The first number represents the average percent absolute cover of the plant in the stands sampled, and the number in parentheses is the percent frequency (or constancy) for the plant occurring in these samples.

Association	Code	Table	Macrogroup
Acacia cyclops	**ACCY**	**D**	California Coastal Scrub
Artemisia californica	**ARCA**	**D**	California Coastal Scrub
Artemisia californica/Leymus condensatus	**ARCA/LECO**	**D**	California Coastal Scrub
Artemisia californica-Eriogonum cinereum	**ARCA-ERCI**	**D**	California Coastal Scrub
Artemisia californica-Opuntia littoralis	**ARCA-OPLI**	**D**	California Coastal Scrub
Artemisia californica-Salvia mellifera	**ARCA-SAME**	**D**	California Coastal Scrub
Atriplex lentiformis (disturbed)	**ATLE dist.**	**C**	Warm Semi-Desert/Mediterranean Alkali-Saline wetland
Avena fatua	**AVFA**	**B**	California Annual and Perennial Grassland
Baccharis pilularis	**BAPI**	**E**	California Coastal Scrub
Baccharis pilularis-Artemisia californica	**BAPI-ARCA**	**E**	California Coastal Scrub
Brachypodium distachyon	**BRDIS**	**B**	California Annual and Perennial Grassland
Brassica nigra-Bromus diandrus	**BRNI-BRDIA**	**B**	California Annual and Perennial Grassland
Bromus rubens - Mixed herb	**BRRU-herb**	**B**	California Annual and Perennial Grassland
Carpobrotus edulis	**CAED**	**C**	Vancouverian Coastal Dune and Bluff
Cylindropuntia prolifera-Mixed coastal scrub	**CYPR-scrub**	**C**	Viscaino-Baja California Desert Scrub
Encelia californica	**ENCA**	**E**	California Coastal Scrub
Encelia californica-Artemisia californica	**ENCA-ARCA**	**E**	California Coastal Scrub
Encelia californica-Eriogonum cinereum	**ENCA-ERCI**	**E**	California Coastal Scrub
Eriogonum cinereum	**ERCI**	**E**	California Coastal Scrub
Eriogonum fasciculatum	**ERFA**	**E**	California Coastal Scrub
Eucalyptus	**EUCAL**	**A**	Introduced N. Amer. Mediterranean Woodland and Forest
Euphorbia terracina	**EUTE**	**B**	California Annual and Perennial Grassland
Foeniculum vulgare	**FOVU**	**B**	California Annual and Perennial Grassland

Association	Code	Table	Macrogroup
Hazardia squarrosa	**HASQ**	**E**	California Coastal Scrub
Heteromeles arbutifolia-Mixed coastal scrub	**HEAR-scrub**	**A**	California Chaparral
Isocoma menziesii	**ISME**	**E**	California Coastal Scrub
Leymus condensatus	**LECO**	**B**	California Annual and Perennial Grassland
Lycium californicum-Encelia californica	**LYCA-ENCA**	**C**	Viscaino-Baja California Desert Scrub
Nassella lepida	**NALE**	**B**	California Annual and Perennial Grassland
Opuntia littoralis-Mixed coastal scrub	**OPLI-scrub**	**C**	Viscaino-Baja California Desert Scrub
Rhus integrifolia	**RHIN**	**A**	Californian Maritime Chaparral
Rhus integrifolia (disturbed)	**RHIN dist.**	**A**	Californian Maritime Chaparral
Rhus integrifolia-Artemisia californica-Eriogonum cinereum	**RHIN-ARCA-ERCI**	**A**	Californian Maritime Chaparral
Rhus integrifolia-Opuntia littoralis-Eriogonum cinereum	**RHIN-OPLI-ERCI**	**A**	Californian Maritime Chaparral
Salix lasiolepis (disturbed)	**SALA dist.**	**A**	SW N. Amer. Riparian, Flooded and Swamp Forest/Scrubland
Salix lasiolepis-Baccharis salicifolia	**SALA-BASA**	**A**	SW N. Amer. Riparian, Flooded and Swamp Forest/Scrubland
Salvia leucophylla	**SALE**	**D**	California Coastal Scrub
Salvia leucophylla-Artemisia californica	**SALE-ARCA**	**D**	California Coastal Scrub
Salvia mellifera	**SAME**	**D**	California Coastal Scrub
Salvia mellifera-Eriogonum cinereum-Rhus integrifolia	**SAME-ERCI-RHIN**	**D**	California Coastal Scrub
Steep bluff/slope *(Eriogonum-Encelia)*	**STEEP**	**C**	California Cliff, Scree, and Other Rock Vegetation
Unclassified herbaceous	**HERBS**	**B**	California Annual and Perennial Grassland

Appendix G - Table 1. Species composition of stands/associations of woodlands or chaparral.

	TREE TYPES		CHAPARRAL TYPES					RIPARIAN TYPES	
	EUCAL	**PINUS**	**HEAR-scrub**	**RHIN**	**RHIN dist.**	**RHIN-ARCA-ERCI**	**RHIN-OPLI-ERCI**	**SALA dist.**	**SALA-BASA**
	N = 2	**N = 2**	**N = 4**	**N = 12**	**N = 2**	**N = 2**	**N = 2**	**N = 1**	**N = 2**
Acacia cyclops	1.5 (100)	9.0 (100)	0.8 (50)	1.5 (50)	40.0 (100)	0.2 (100)			
Artemisia californica	1.5 (50)		3.0 (75)	1.1 (83)	0.6 (100)	2.0 (100)	2.1 (100)		0.1 (50)
Artemisia douglasiana									1.6 (100)
Atriplex lentiformis							0.1 (33)	12.0 (100)	
Avena	0.6 (100)	1.5 (100)	0.4 (75)			1.0 (100)			
Avena fatua									1.5 (50)
Baccharis pilularis			9.8 (75)					3.0 (100)	1.5 (50)
Baccharis salicifolia									11.0 (100)
Brachypodium distachyon					0.1 (50)		0.3 (33)		
Brassica nigra	2.6 (100)	2.5 (100)	1.1 (100)	0.8 (83)	3.0 (100)	1.0 (100)	1.3 (100)	0.2 (100)	1.0 (50)
Bromus diandrus	7.5 (100)	8.0 (100)	1.3 (75)	1.9 (58)		4.0 (100)	0.4 (67)	0.2 (100)	2.0 (50)
Bromus rubens		0.1 (50)	0.5 (50)	0.9 (50)	1.0 (50)	2.0 (100)	0.4 (67)		
Carpobrotus edulis		0.5 (50)					0.1 (33)		
Centaurea melitensis	0.1 (50)	0.1 (50)	1.8 (50)	0.2 (42)	3.1 (100)				
Cortaderia jubata								8.0 (100)	
Cylindropuntia prolifera							0.1 (33)		
Cyperus involucratus									0.1 (50)
Encelia californica	0.2 (100)			1.1 (83)	1.1 (100)	0.2 (100)	2.0 (33)		0.1 (50)
Eriogonum cinereum	0.1 (50)			0.4 (33)	0.5 (50)	6.0 (100)	12.7 (100)		
Eriogonum fasciculatum					1.0 (100)		6.0 (33)		
Erodium cicutarium					0.1 (50)				
Eschscholzia californica									0.1 (50)
Eucalyptus	57.5 (100)								
Eucrypta chrysanthemifolia							0.1 (33)		0.1 (50)
Euphorbia spathulata								0.2 (100)	
Foeniculum vulgare		1.0 (50)	2.6 (75)					5.0 (100)	1.5 (50)
Fraxinus latifolia									0.1 (50)
Galium aparine									0.1 (50)
Geranium dissectum									0.1 (50)
Graminoid (grass or grasslike)							0.7 (33)		

	TREE TYPES		CHAPARRAL TYPES					RIPARIAN TYPES	
	EUCAL	**PINUS**	**HEAR-scrub**	**RHIN**	**RHIN dist.**	**RHIN-ARCA-ERCI**	**RHIN-OPLI-ERCI**	**SALA dist.**	**SALA-BASA**
Heteromeles arbutifolia			23.5 (100)						
Hirschfeldia incana									0.1 (50)
Hordeum		1.5 (50)							
Isocoma menziesii									0.1 (50)
Isomeris arborea		0.1 (50)							
Jacaranda								7.0 (100)	
Keckiella cordifolia								0.2 (100)	
Leymus condensatus								12.0 (100)	6.5 (100)
Lycium californicum						0.2 (100)			
Malacothrix saxatilis	0.1 (50)					0.2 (100)			
Malosma laurina					0.1 (50)				
Malva neglecta									1.0 (50)
Malva parviflora		0.1 (50)							
Marah macrocarpus	0.1 (50)	0.2 (100)	0.4 (75)	0.4 (75)	0.6 (100)	0.2 (100)	0.1 (33)	0.2 (100)	0.6 (100)
Marrubium vulgare		0.1 (50)							0.1 (50)
Melica imperfecta								0.2 (100)	
Melilotus indicus	0.1 (50)				0.1 (50)				
Mirabilis californica					0.1 (50)				
Myoporum								0.2 (100)	
Nassella lepida					0.6 (100)		0.7 (33)		
Nicotiana glauca									0.1 (50)
Opuntia littoralis	0.5 (50)				0.1 (50)	0.2 (100)	11.7 (100)		
Phacelia ramosissima						0.2 (100)			
Pinus		27.5 (100)							
Piptatherum		0.1 (50)							
Piptatherum miliaceum								1.0 (100)	
Pistacia chinensis Bunge	0.2 (100)								
Pittosporum								0.2 (100)	
Raphanus raphanistrum			0.8 (50)						
Raphanus sativus									1.0 (50)
Rhus integrifolia	8.5 (100)	8.0 (100)	5.3 (100)	57.5 (100)	42.5 (100)	18.0 (100)	21.7 (100)	6.0 (100)	0.1 (50)
Salix lasiolepis								8.0 (100)	28.0 (100)

	TREE TYPES		CHAPARRAL TYPES					RIPARIAN TYPES	
	EUCAL	**PINUS**	**HEAR-scrub**	**RHIN**	**RHIN dist.**	**RHIN-ARCA-ERCI**	**RHIN-OPLI-ERCI**	**SALA dist.**	**SALA-BASA**
Salsola tragus	0.2 (100)					0.2 (100)	0.1 (33)		
Salvia leucophylla				5.2 (42)	2.0 (100)		0.1 (33)		
Salvia mellifera								0.2 (100)	0.1 (50)
Schinus molle		0.1 (50)						6.0 (100)	
Vicia sativa									1.0 (50)
Vulpia microstachys									0.1 (50)

Appendix G - Table 2. Species composition of stands/associations in the California Annual and Perennial Grassland Macrogroup.

	ANNUAL HERBACEOUS TYPES					PERENNIAL HERBACEOUS TYPES			
	AVFA	**BRDIS**	**BRNI-BRDIA**	**BRRU-herb**	**HERBS**	**EUTE**	**FOVU**	**LECO**	**NALE**
	N = 1	**N = 2**	**N = 4**	**N = 1**	**N = 1**	**N = 1**	**N = 4**	**N = 3**	**N = 1**
Acacia cyclops	3.0 (100)	0.1 (50)							
Artemisia californica								0.1 (67)	
Astragalus trichopodus				3.0 (100)		0.2 (100)			
Avena		6.5 (100)					1.3 (50)		
Avena barbata						2.0 (100)			
Avena fatua	22.0 (100)					0.2 (100)	0.5 (50)		
Baccharis pilularis							0.8 (50)		
Brachypodium distachyon		20.0 (100)							
Brassica nigra	1.0 (100)	3.6 (100)	16.3 (100)	1.0 (100)		3.0 (100)	2.3 (100)	0.3 (33)	0.2 (100)
Bromus diandrus	2.0 (100)	2.0 (100)	20.8 (100)	1.0 (100)	1.0 (100)	0.2 (100)	5.0 (100)	1.7 (67)	45.0 (100)
Bromus hordeaceus				0.2 (100)	0.2 (100)				
Bromus rubens				30.0 (100)	0.2 (100)	23.0 (100)			
Carpobrotus edulis							0.1 (50)		
Centaurea melitensis	0.2 (100)	0.1 (50)		0.2 (100)	8.0 (100)	2.0 (100)			
Chrysanthemum coronarium					22.0 (100)				
Dudleya virens				0.2 (100)					
Encelia californica			0.35 (75)						1.0 (100)
Eriogonum cinereum			1.3 (50)						
Erodium cicutarium				1.0 (100)					
Euphorbia terracina						4.0 (100)			
Foeniculum vulgare		4.0 (100)	0.9 (100)				25.3 (100)	2.5 (100)	
Graminoid (grass or grasslike)				0.2 (100)			0.1 (50)		
Hazardia squarrosa						0.2 (100)			
Heteromeles arbutifolia							1.3 (50)		
Hordeum				0.2 (100)					
Isomeris arborea			0.3 (50)					0.7 (33)	
Lactuca saligna				0.2 (100)					
Leymus condensatus	0.2 (100)							50.7 (100)	
Lupinus longifolius				1.0 (100)					

	ANNUAL HERBACEOUS TYPES					PERENNIAL HERBACEOUS TYPES			
	AVFA	**BRDIS**	**BRNI-BRDIA**	**BRRU-herb**	**HERBS**	**EUTE**	**FOVU**	**LECO**	**NALE**
	N = 1	**N = 2**	**N = 4**	**N = 1**	**N = 1**	**N = 1**	**N = 4**	**N = 3**	**N = 1**
Lupinus succulentus		0.1 (50)							
Malacothrix saxatilis								0.1 (33)	
Malva neglecta								0.1 (33)	
Malva parviflora							0.1 (50)		
Marah macrocarpus			0.3 (50)				0.1 (50)	0.7 (67)	
Melilotus indicus	0.2 (100)	0.1 (50)		2.0 (100)		0.2 (100)			
Nassella lepida									39.0 (100)
Nicotiana glauca							0.3 (50)		
Picris echioides		1.6 (100)							
Pistacia chinensis Bunge	1.0 (100)							0.1 (33)	
Raphanus sativus							0.1 (50)		
Rhus integrifolia	2.0 (100)						0.55 (50)		
Ricinus communis								3.3 (33)	
Salsola tragus			0.1 (50)						
Schinus molle	1.0 (100)								

Appendix G - Table 3. Species composition of miscellaneous stands/associations on coastal dunes, bluffs, and coastal flats.

	COASTAL BLUFF /DESERT SUCCULENT SCRUB TYPES				OTHER TYPES	
	CYPR-scrub	**LYCA-ENCA**	**OPLI-scrub**	**STEEP**	**ATLE dist.**	**CAED**
	N = 3	**N = 11**	**N = 12**	**N = 3**	**N = 6**	**N = 2**
Acacia cyclops	0.1 (33)	1.2 (45)	0.2 (33)	0.1 (33)	2.2 (67)	0.1 (50)
Amblyopappus pusillus		0.1 (36)				
Artemisia californica	3.7 (33)		11.4 (100)	0.4 (67)	1.4 (50)	1.1 (100)
Atriplex lentiformis					29.8 (100)	
Atriplex pacifica					0.1 (50)	
Atriplex semibaccata		0.2 (45)				
Avena					0.4 (33)	4.5 (100)
Avena fatua				0.1 (33)		
Baccharis pilularis					3.8 (67)	
Brachypodium distachyon					1.7 (33)	0.5 (50)
Brassica nigra	0.1 (33)	0.2 (45)	1.2 (83)	0.5 (100)	1.2 (100)	1.5 (100)
Bromus						0.1 (50)
Bromus diandrus		1.7 (73)	0.5 (42)	2.7 (67)	2.2 (83)	8.1 (100)
Bromus rubens	2.3 (67)	1.9 (100)	0.6 (58)	1.1 (67)	1.7 (50)	
Carpobrotus edulis						30 (100)
Centaurea melitensis	0.1 (33)	0.4 (55)	0.2 (42)	0.1 (67)	0.1 (33)	
Chamaesyce				0.3 (33)		
Chrysanthemum coronarium					1.2 (33)	
Crossosoma californicum	0.7 (33)					
Cylindropuntia prolifera	24 (100)	1.4 (55)	0.4 (50)	0.3 (33)		0.1 (50)
Dudleya	0.1 (33)					
Dudleya virens		0.4 (36)		3.3 (33)		
Encelia californica	13.3 (100)	8.4 (100)	3.4 (100)	4.7 (67)	1.2 (33)	0.6 (100)
Eriogonum cinereum	1.7 (67)		9.2 (83)	2.4 (100)		2.6 (100)
Eriogonum fasciculatum	0.3 (33)			4.3 (33)		
Euphorbia terracina						0.1 (50)
Foeniculum vulgare				0.1 (33)	0.3 (83)	0.1 (50)
Limonium perezii					0.53 (33)	
Lycium brevipes		13.1 (36)				

	COASTAL BLUFF /DESERT SUCCULENT SCRUB TYPES				OTHER TYPES	
	CYPR-scrub	**LYCA-ENCA**	**OPLI-scrub**	**STEEP**	**ATLE dist.**	**CAED**
	N = 3	**N = 11**	**N = 12**	**N = 3**	**N = 6**	**N = 2**
Lycium californicum	0.3 (33)	3.5 (55)				
Malacothrix saxatilis				0.1 (33)	0.2 (50)	0.1 (50)
Malva parviflora					0.1 (33)	
Marah macrocarpus	0.1 (33)	0.1 (36)	0.2 (42)		0.1 (67)	
Melilotus indicus	0.1 (33)			0.1 (33)	0.5 (33)	
Mesembryanthemum crystallinum	0.4 (67)	0.7 (91)			0.2 (33)	
Mirabilis californica				0.1 (33)		
Nassella lepida				0.1 (33)		0.1 (50)
Nicotiana glauca		0.1 (36)		0.1 (33)	0.2 (33)	
Opuntia littoralis	0.1 (33)		19.9 (100)	0.3 (33)		0.1 (50)
Picris echioides				0.1 (33)		
Piptatherum	1.7 (33)					
Rhus integrifolia	4.3 (100)	5.8 (73)	4.7 (83)	1.1 (67)	0.1 (50)	0.2 (100)
Ricinus communis					1.0 (50)	
Salsola tragus		0.2 (45)	0.1 (33)	0.1 (33)		0.1 (50)
Salvia mellifera	6.7 (67)			0.7 (33)		
Schinus molle			0.5 (33)		1.7 (50)	

Appendix G - Table 4. Species composition of stands/associations in the California Coastal Scrub Macrogroup, part 1.

	COASTAL SCRUB TYPES									
	ACCY	**ARCA**	**ARCA/ LECO**	**ARCA-ERCI**	**ARCA-OPLI**	**ARCA-SAME**	**SALE**	**SALE-ARCA**	**SAME**	**SAME-ERCI-RHIN**
	N = 3	**N = 4**	**N = 4**	**N = 8**	**N = 8**	**N = 1**	**N = 3**	**N= 4**	**N = 2**	**N = 5**
Acacia cyclops	40.0 (100)	0.4 (75)			0.3 (38)		1.1 (67)			
Artemisia californica	0.7 (33)	37.8 (100)	31.3 (100)	20.9 (100)	38.0 (100)	20.0 (100)	1.7 (100)	18.8 (100)	1.0 (100)	5.0 (100)
Avena	2.3 (100)						0.1 (33)			
Avena barbata							0.1 (33)			
Baccharis pilularis		1.5 (75)		0.6 (38)			0.1 (33)	3.8 (75)		
Brachypodium distachyon	2.0 (33)									
Brassica nigra	3.0 (100)	1.7 (100)	0.1 (50)	1.9 (75)	2.3 (100)		0.4 (67)	1.8 (50)	0.1 (50)	0.1 (40)
Bromus diandrus	6.0 (100)	1.5 (100)	5.1 (50)	2.1 (88)	1.5 (50)		0.1 (33)		1.0 (50)	
Bromus rubens		0.5 (50)		2.9 (88)			0.1 (33)		0.5 (50)	
Bromus	0.3 (33)									
Calochortus catalinae						0.2 (100)				
Carpobrotus edulis	0.1 (33)									
Castilleja affinis	0.1 (33)					0.2 (100)			0.1 (50)	
Centaurea melitensis				0.2 (50)			2.7 (67)	0.8 (50)	0.1 (50)	
Chamaesyce albomarginata									0.1 (50)	
Crossosoma californicum										3.8 (40)
Cylindropuntia prolifera					0.2 (75)	1.0 (100)	0.1 (33)		1.5 (50)	
Dudleya lanceolata						0.2 (100)				
Dudleya virens									0.1 (50)	
Encelia californica		3.8 (75)	0.6 (50)	4.1 (100)	1.6 (100)	1.0 (100)	2.3 (100)	3.3 (75)	3.0 (100)	
Eriogonum cinereum				14.4 (100)	2.1 (50)	1.0 (100)	0.7 (67)	4.0 (75)	2.0 (100)	6.8 (100)
Eriogonum fasciculatum		0.1 (50)		0.4 (38)		8.0 (100)	1.4 (67)		0.1 (50)	1.24 (80)
Eucalyptus	0.3 (33)									
Euphorbia terracina	0.1 (33)									
Foeniculum vulgare	0.1 (33)	0.1 (50)	1.1 (75)	0.1 (38)	0.1 (38)				0.1 (50)	
Forb (herbaceous)		0.3 (50)								

	COASTAL SCRUB TYPES									
	ACCY	**ARCA**	**ARCA/ LECO**	**ARCA-ERCI**	**ARCA-OPLI**	**ARCA-SAME**	**SALE**	**SALE-ARCA**	**SAME**	**SAME-ERCI-RHIN**
	N = 3	**N = 4**	**N = 4**	**N = 8**	**N = 8**	**N = 1**	**N = 3**	**N= 4**	**N = 2**	**N = 5**
Galium angustifolium				0.9 (38)						0.7 (60)
Graminoid	0.1 (33)									
Hazardia squarrosa	0.3 (33)									
Heteromeles arbutifolia							0.1 (67)			
Hirschfeldia incana									0.1 (50)	
Hordeum vulgare									0.1 (50)	
Isomeris arborea	0.1 (33)						0.1 (33)			
Leymus condensatus	0.1 (33)		18.0 (100)					0.1 (50)		
Lichen							0.3 (33)	0.3 (50)		
Malacothrix saxatilis							0.1 (33)			
Malva parviflora	0.1 (67)									
Marah macrocarpus	0.1 (67)	0.1 (50)	0.8 (50)	0.4 (38)	0.6 (100)		0.2 (100)	0.2 (75)	0.1 (50)	
Marrubium vulgare	0.1 (33)						0.1 (33)			
Melica imperfecta	0.1 (33)									
Melilotus albus							0.1 (33)			
Melilotus indicus				0.3 (50)						
Nassella							0.3 (33)			
Nassella lepida				0.5 (38)			0.1 (67)	1.6 (100)	0.5 (50)	1.0 (60)
Nicotiana glauca				0.1 (38)						
Opuntia littoralis				0.2 (38)	6.9 (100)	1.0 (100)	0.1 (33)			
Pennisetum setaceum	0.1 (33)									
Picris echioides	0.1 (67)									
Pistacia chinensis	0.1 (33)								0.1 (50)	
Rhus integrifolia	1.3 (100)		0.8 (75)	1.7 (75)	4.9 (100)	2.0 (100)	17.0 (100)	5.8 (100)	1.0 (100)	13.4 (100)
Salvia leucophylla	0.1 (33)			0.425 (50)			37.3 (100)	29.8 (100)	0.5 (50)	
Salvia mellifera				1.525 (50)		15.0 (100)	0.1 (33)	1.8 (50)	38.0 (100)	15.2 (100)
Schinus molle	0.7 (67)	0.3 (50)								
Stachys							0.1 (33)			
Unknown tree	0.1 (33)									

	COASTAL SCRUB TYPES									
	ACCY	**ARCA**	**ARCA/ LECO**	**ARCA-ERCI**	**ARCA-OPLI**	**ARCA-SAME**	**SALE**	**SALE-ARCA**	**SAME**	**SAME-ERCI-RHIN**
	N = 3	**N = 4**	**N = 4**	**N = 8**	**N = 8**	**N = 1**	**N = 3**	**N= 4**	**N = 2**	**N = 5**
Washingtonia filifera	0.1 (33)									
Washingtonia robusta	0.1 (33)									

Appendix G - Table 5. Species composition of stands/associations in the California Coastal Scrub Macrogroup, part 2.

	COASTAL SCRUB TYPES CONTINUED							COASTAL SUB-SHRUB TYPES	
	BAPI	**BAPI-ARCA**	**ENCA**	**ENCA-ARCA**	**ENCA-ERCI**	**ERCI**	**ERFA**	**HASQ**	**ISME**
	N = 3	**N = 4**	**N = 8**	**N = 2**	**N = 4**	**N = 1**	**N = 2**	**N = 1**	**N = 1**
Acacia cyclops	0.1 (33)		0.2 (63)	0.1 (50)		1 (100)			
Artemisia californica	0.4 (67)	17.0 (100)	1.0 (63)	40.0 (100)	3.3 (75)		0.1 (50)		
Asclepias fascicularis								0.2 (100)	
Atriplex lentiformis						1.0 (100)			
Atriplex semibaccata						0.2 (100)			
Avena		0.1 (50)	1.3 (38)			0.2 (100)	1.0 (50)	7.0 (100)	1.0 (100)
Avena barbata					0.3 (50)				
Avena fatua	0.1 (33)			0.1 (50)					
Baccharis pilularis	31.7 (100)	31.5 (100)						1.0 (100)	
Brassica nigra	5.0 (67)	1.3 (75)	4.0 (100)	3.5 (100)	2.3 (100)	1.0 (100)	0.2 (100)	1.0 (100)	0.2 (100)
Bromus diandrus	6.4 (100)	3.0 (75)	8.1 (88)	2.0 (100)	8.0 (100)		0.1 (50)	4.0 (100)	
Bromus hordeaceus	0.1 (33)							2.0 (100)	1.0 (100)
Bromus rubens	0.1 (33)		5.3 (75)	1.5 (50)	14.0 (50)	0.2 (100)	0.6 (100)	2.0 (100)	
Calochortus									0.2 (100)
Centaurea melitensis	0.1 (33)		0.8 (75)	0.1 (50)	1.0 (50)		0.1 (50)	1.0 (100)	
Chrysanthemum coronarium	0.1 (33)								
Cortaderia selloana	0.1 (33)								
Cylindropuntia prolifera			0.2 (38)			0.2 (100)			
Dichelostemma							0.1 (50)		
Dichelostemma capitatum							0.1 (50)	0.2 (100)	0.2 (100)
Encelia californica	0.1 (67)	0.1 (50)	22.0 (100)	34.5 (100)	17.0 (100)				
Eriogonum cinereum	0.3 (33)		0.5 (38)	0.1 (50)	18.0 (100)	16.0 (100)			
Eriogonum fasciculatum							38.0 (100)		
Foeniculum vulgare	2.7 (67)	2.1 (75)	0.45 (50)	0.1 (50)			0.1 (50)	4.0 (100)	2.0 (100)
Galium aparine									0.2 (100)
Gnaphalium californicum	0.1 (33)								
Graminoid (grass or grasslike)									0.2 (100)
Hazardia squarrosa	1.3 (33)			1.0 (50)				18.0 (100)	
Heteromeles arbutifolia	2.0 (33)								

	COASTAL SCRUB TYPES CONTINUED							COASTAL SUB-SHRUB TYPES	
	BAPI	**BAPI-ARCA**	**ENCA**	**ENCA-ARCA**	**ENCA-ERCI**	**ERCI**	**ERFA**	**HASQ**	**ISME**
	N = 3	**N = 4**	**N = 8**	**N = 2**	**N = 4**	**N = 1**	**N = 2**	**N = 1**	**N = 1**
Hirschfeldia incana								1.0 (100)	
Isocoma menziesii	0.1 (33)						2.0 (50)		31.0 (100)
Lichen				0.1 (50)					
Lupinus								0.2 (100)	
Lupinus succulentus	0.1 (33)								
Malacothrix saxatilis	0.1 (33)								
Marah macrocarpus		0.2 (100)							
Marrubium vulgare			0.1 (38)						
Melilotus albus	0.1 (33)							0.2 (100)	0.2 (100)
Melilotus indicus	0.4 (67)		0.2 (50)	0.5 (50)					
Mesembryanthemum crystallinum						0.2 (100)			
Mirabilis californica					0.3 (50)				
Nassella lepida				0.1 (50)			0.6 (100)		
Nicotiana glauca	0.1 (33)					0.2 (100)			
Opuntia littoralis			0.1 (38)		0.4 (75)	2.0 (100)	1.5 (50)		
Picris echioides								0.2 (100)	1.0 (100)
Rhus integrifolia	2.7 (67)	1.8 (75)	2.0 (100)	0.6 (100)	0.6 (50)	4.0 (100)	1.6 (100)	8.0 (100)	2.0 (100)
Salsola tragus	0.1 (33)		0.3 (38)			0.2 (100)			
Salvia leucophylla									1.0 (100)
Salvia mellifera	0.1 (33)				0.3 (50)				
Sonchus oleraceus								0.2 (100)	

H. FIELD KEY TO THE FLORISTICALLY DEFINED VEGETATION TYPES

APPENDIX H

FIELD KEY TO THE FLORISTICALLY DEFINED VEGETATION TYPES IN PVNP WITH MAPPING CLASSIFICATION CODES AND NAMES

Class A. Vegetation with an overstory of trees (at least 5 m tall). Absolute tree canopy cover is generally >10% but occasionally may be < 10% over a denser understory of shrub and/or herbaceous species. If the latter, trees are evenly distributed across the stand and are ecologically significant members of the stand (stand is thus "characterized" by trees, even if not "dominated" by them). = **Tree-Overstory Vegetation**

Class B. Vegetation characterized by woody shrubs in the canopy. Tree species, if present, generally total < 10% absolute cover. Herbaceous species may total higher cover than shrubs. Shrubs are usually at least 10% cover. = **Shrub-Overstory Vegetation (p. 2)**

Class C. Vegetation characterized by nonwoody, herbaceous species in the canopy including grass, graminoid, and broad-leaved herbaceous species. Shrubs, if present, usually comprise < 10% absolute cover. Trees, if present, generally compose < 5% absolute cover. = **Herbaceous Vegetation (p. 7)**

Class A. Tree-Overstory Vegetation (with Sections I and II)

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

I.A.1. The overstory is strongly dominated (>75% cover) by pine *(Pinus)* or other coniferous trees (none native to the mapping area) alone or in shared dominance with broadleaf evergreen trees or shrubs.

> **I.A.1.** Introduced pine (*Pinus* spp.) or other conifers occur as the dominant tree or co-occurs with other tree species in an open overstory.
>
> ***Pinus* spp. (Conifer) mapping unit (9520)**

> **I.A.2.** Another non-native tree species dominates or co-dominates in upland or riparian areas, though there may be a minor presence of native trees/shrubs.
>
> **Non-Native Tree Vegetation (9500)**

Section II. Woodlands and forests characterized mainly by broad-leaved evergreen and deciduous tree species such as willows *(Salix),* eucalyptus, and others.

II.A. Riparian woodlands or shrublands in which arroyo willow *(Salix lasiolepis)* is dominant or co-dominant with other shrubs/trees.

***Salix lasiolepis* Alliance (1430)**

> **II.A.1.** Mulefat is a characteristic subdominant or codominant with arroyo willow.
>
> ***Salix lasiolepis/Baccharis salicifolia* Association (1432)**

> **II.A.2.** Other shrubs are common and co-dominant in a matrix with the arroyo willow, and may include non-native and native shrubs.
>
> ***Salix lasiolepis* (disturbed) Association (1431)**

II.B. A *Eucalyptus* species dominates in the tree/shrub canopy, though there may be a minor presence of native trees/shrubs.

***Eucalyptus (camaldulensis, globulus)* Stands (9510)**

II.C. A species of *Schinus* (pepper tree) and/or *Myoporum laetum* (ngaio tree) dominates in the tree/shrub canopy, though there may be a minor presence of native trees/shrubs. Stands can be planted and become invasive.

Schinus molle, Myoporum laetum Stands (9550)

II.D. Another non-native tree species dominates or co-dominates in upland or riparian areas, though there may be a minor presence of native trees/shrubs.

Non-Native Tree Vegetation (9500)

II.E. Other tree species of native origin dominates or co-dominates in riparian areas, and there may be some presence of non-native trees/shrubs.

Riparian/Wash Scrub and Woodland Macrogroup (1414)

Class B. Shrub-Overstory Vegetation (with Sections I, II and III).

Section I: Shrublands are dominated by sclerophyllous temperate broad-leaved shrubs (with leaves hardened by a waxy cuticle). They are dominated (at >50% relative cover) by typical chaparral shrub genera including sumac (*Rhus*), toyon (*Heteromeles*), coffeeberry *(Rhamnus),* and so forth. This section also includes vegetation dominated or codominated by large broad-leaved evergreen species, which may be associated with shorter nonsclerophyll shrubs.

I.A. The shrubland overstory is strongly dominated (at >75% relative cover) by Acacia (*Acacia).*

***Acacia cyclops* Semi-Natural Stands (9541)**

I.B. The overstory is strongly dominated (at >75% relative cover) by other non-native shrub species.

Non-Native/Naturalized Mediterranean Scrub Vegetation (9540)

I.C. The overstory is dominated by lemonade berry *(Rhus integrifolia),* toyon *(Heteromeles arbutifolia),* or other chaparral species, and other evergreen, coastal scrub, or succulent shrubs may be present at low cover or sometimes shared dominance.

I.C.1. Lemonade berry occurs as the dominant shrub in an open to intermittent overstory while other shrubs (mostly coastal scrub species) may be present at lower cover.

***Rhus integrifolia* Alliance (2150)**

I.C.1.a. Lemonade berry strongly dominates the shrub layer, though the shrub layer is open to dense in cover.

***Rhus integrifolia* Association (2153)**

I.C.1.b. Lemonade berry is conspicuous in the shrub layer but regularly has smaller, usually drought-deciduous coastal scrub shrubs associating with it.

I.C.1.b.i. California sagebrush and/or ashy buckwheat are subdominants or may occur in equal cover (in total) to lemonade berry.

***Rhus integrifolia-Artemisia californica-Eriogonum cinereum* Association (7157)**

I.C.1.b.ii. Coast prickly pear cactus and ashy buckwheat are conspicuous species in the shrub layer, with a dominance of lemonade berry.

***Rhus integrifolia-Opuntia littoralis-Eriogonum cinereum* Association (2151)**

I.C.1.c. Lemonade berry is conspicuous in the shrub layer but has non-native shrubs, and other species, associating with it.

***Rhus integrifolia* (disturbed Association (2152)**

I.C.3. Toyon occurs as a dominant shrub or codominant with coastal scrub in an open to continuous shrub overstory.

***Heteromeles arbutifolia* Alliance (2130)**

I.C.3.a. Coastal scrub species (e.g., *Baccharis pilularis, Encelia californica)* occur as subdominants or sometimes codominants with toyon in the overstory, and there may be several shrub species (including *Rhus integrifolia*) associated in the stands.

***Heteromeles arbutifolia*-Mixed coastal scrub Association (2131)**

I.D. Shrub overstory is dominated by chaparral species of unknown species composition obviously not dominated by other types of shrubs (i.e. while remotely mapping).

California Chaparral Macrogroup (2000)

Section II. Shrublands are dominated mainly by soft-leaved or succulent shrubs that are microphyllous or broad-leaved, and they include cactus, drought-deciduous, summer-deciduous, and/or cold-deciduous species. These are generally considered to be part of coastal sage scrub or other more soft-leaved shrub habitats. Chaparral species may be present but are not dominant. Included are shrub willow *(Salix),* baccharis *(Baccharis),* buckwheat *(Eriogonum),* sagebrush *(Artemisia),* sage *(Salvia),* prickly pear *(Opuntia),* coyote bush (*Baccharis pilularis),* and so forth.

II.A. The shrub overstory is characterized by shrubs primarily found in riparian or wetland habitats.

II.A.1. Shrublands in which a willow *(Salix*) is dominant, usually as a tall shrub or low tree. An emergent and sparse overstory tree layer may also be present.

II.A.1.a. Arroyo willow is the dominant species. (Note: May also be considered a tree, see tree key above.) It may be accompanied by mulefat *(Baccharis salicifolia),* or other riparian shrubs.

***Salix lasiolepis* Alliance (1430)**

II.A.1.a.i. Mule fat is a characteristic subdominant or codominant with arroyo willow.

***Salix lasiolepis/Baccharis salicifolia* Association (1432)**

II.A.1.a.ii. Other shrubs are subdominant to codominant with arroyo willow, including native and non-native shrubs.

***Salix lasiolepis* (disturbed) Association (1431)**

II.A.2. Shrublands are characterized by the dominance of mule fat alone or in shared dominance with other shrubs. An emergent and sparse tree layer of willows or other species may also be present. This type has not been found yet could occur in the region

Baccharis salicifolia Alliance (2210)
Baccharis salicifolia Association (2212)

II.A.3. Another shrub species of native origin appears to dominate or co-dominate in riparian areas, and there may be some presence of non-native trees/shrubs.

Riparian/Wash Scrub and Woodland Macrogroup (1414)

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

II.B.1. Shrubland is usually characterized by the dominance of a species of encelia *(Encelia)* alone or in shared dominance with other shrubs. California sagebrush *(Artemisia californica)* occasionally may be dominant when encelia has at least 5 percent cover.

II.B.1.a. Shrubland in which California encelia *(Encelia californica)* is dominant or codominant in the canopy.

***Encelia californica* Alliance (3220)**

II.B.1.a.i. California encelia is the sole dominant or occurs with subdominant California buckwheat.

***Encelia californica* Association (3222)**

II.B.1.a.ii. California sagebrush is characteristically subdominant to codominant with California encelia.

***Encelia californica-Artemisia californica* Association (3227)**

II.B.1.a.iii. Ashy buckwheat *(Eriogonum cinereum)* codominates or is subdominant with California encelia.

***Encelia californica-Eriogonum cinereum* Association (3225)**

II.B.2. Shrubland with a succulent coastal prickly pear, cholla, or boxthorn is dominant or codominant with other species such as California Encelia and Sagebrush.

II.B.2.a. Coast prickly pear *(Opuntia littoralis)* or cholla *(Cylindropuntia prolifera) (Opuntia littoralis)* is dominant or codominant with coastal sage scrub species and other cactus species.

***Opuntia littoralis* Alliance (2410)**

II.B.2.a.i. *Opuntia littoralis* (or other related *Opuntia*) is present along with other coastal sage scrub species (*Eriogonum* spp., *Encelia californica, Artemisia californica,* etc.).

***Opuntia littoralis*-Mixed Coastal Sage Scrub Association (2412)**

II.B.2.a.ii. Cholla *(Cylindropuntia prolifera)* is dominant or codominant with other coastal scrub species.

***Cylindropuntia prolifera*-Mixed Coastal Sage Scrub Association (2414)**

II.B.2.b. Shrubland in which Boxthorn (*Lycium*) is dominant, codominant or characteristically present with a mixture of other shrubs (and herbs), usually on coastal bluffs.

***Lycium californicum* Alliance (2420)**

II.B.2.b.i. A mixture of shrubs including California Encelia, Ashy Buckwheat, Lemonadeberry, etc., occur usually as subdominants to codominants with the *Lycium*. Sometimes *Lycium* is lower in cover than these associates.

***Lycium californicum-Encelia californica* Association (2421)**

II.B.3. Shrubland with these or other succulent species dominant or codominant with coastal scrub species, but stand dominance is not identifiable. Stands may have sparse (<10%) to high cover (up to 100% total cover)

III.B.3.a. Various plants (grasses, forbs, succulents, shrubs) including *Dudleya* spp., California encelia, boxthorn, or buckwheat occur at sparse cover (<10% total cover) on steep slopes or cliffs.

Steep Rocky Coastal Slope / Cliff (9001)

III.B.3.b. Stands include species such as *Opuntia* or other coastal desert succulents; however, stand dominance is not identifiable and cover is low to high (10-100% total cover)

Viscaino-Baja California Desert/Succulent Scrub Macrogroup (2400)

II.B.4. Shrubland in which California sagebrush *(Artemisia)* is dominant or codominant with black sage, California buckwheat, ashy buckwheat, etc., in the canopy. The shrub canopy is sometimes over a higher cover of annual or perennial herbs such as bromes *(Bromus)*, wild oats (*Avena*), etc.

II.B.4.a. California sagebrush is codominant with purple sage, and sometimes other shrubs may also be codominant.

***Salvia leucophylla* Alliance (3310)**

II.B.4.a.i. California sagebrush and purple sage are the sole dominants in the shrub canopy.

***Salvia leucophylla-Artemisia californica* Association (3391)**

II.B.4.b. California sagebrush is the sole dominant species in the canopy, or it is sometimes codominant with ashy buckwheat. A high cover of annual or perennial herbs such as bromes *(Bromus)* may be present.

***Artemisia californica* Alliance (3210)**

II.B.4.b.i. California sagebrush is the sole dominant species in the shrub canopy, stands may be open to dense with a sparse to dense understory of herbaceous species.

***Artemisia californica* Association (8213)**

II.B.4.b.ii. Giant wild rye is a conspicuous understory species (may be as tall as California sagebrush) while California sagebrush is the main cover in the shrub overstory.

***Artemisia californica/Leymus condensatus* Association (3216)**

II.B.4.b.iii. Ashy buckwheat is a subdominant to codominant with California sagebrush. Bush monkey flower and understory grasses may be present.

***Artemisia californica-Eriogonum cinereum* Association (3214)**

II.B.4.b.iv. Coastal pricklypear is characteristically present and a subdominant (<30% relative cover) to California sagebrush.

***Artemisia californica-Opuntia littoralis* Association (3212)**

II.B.4.c. California sagebrush and/or ashy buckwheat are subdominants or may sometimes occur near equal in cover to lemonade berry.

***Rhus integrifolia-Artemisia californica-Eriogonum cinereum* Association (7157)**

II.B.4.d. California sagebrush is codominant with California buckwheat and sometimes also with laurel sumac.

Artemisia californica-Eriogonum fasciculatum Alliance (3370)

II.B.5. Shrubland in which a sage *(Salvia)* species is dominant in the canopy or codominant with California buckwheat or brittlebush.

II.B.5.a. Black sage is dominant in the shrub canopy or may codominate with shrubs such as lemonadeberry or ashy buckwheat

***Salvia mellifera* Alliance (3320)**

II.B.5.a.i. Black sage is dominant in the shrub overstory but may occur with subdominant chamise, California buckwheat, or other species.

Salvia mellifera Association (3324)

II.B.5.a.ii. Lemonadeberry and/or ashy buckwheat occurs as subdominants to codominants with black sage. Other shrubs may also co-occur as highly mixed coastal scrub stands.

***Salvia mellifera-Eriogonum cinereum-Rhus integrifolia* Association (3323)**

II.B5.b. California sagebrush is co-dominant with black sage, and sometimes additional other shrubs may also be co-dominant.

***Artemisia californica-Salvia mellifera* Alliance (3420)**

II.B.5.b.i. California sagebrush is subdominant to black sage; stands may include subdominant purple sage.

***Salvia mellifera-Artemisia californica* Association (3421)**

II.B.5.c. Purple sage is the dominant shrub or codominant with other coastal scrub species such as ashy buckwheat or California sagebrush.

***Salvia leucophylla* Alliance (3310)**

II.B.5.c.i. Purple sage is dominant in the shrub layer but may be accompanied by lower cover of several other species including ashy buckwheat, California sagebrush, bush mallow, or understory species of native and nonnative grasses and herbs.

***Salvia leucophylla* Association (3316)**

II.B.5.c.ii. California sagebrush occurs as a codominant with purple sage.

***Salvia leucophylla-Artemisia californica* Association (3391)**

II.B.5.c.iii. Ashy buckwheat occurs as a subdominant or codominant with purple sage, usually in an open to intermittent canopy with annual species in the understory.

Salvia leucophylla-Eriogonum cinereum Association (3312)

II.B.6. Shrubland in which a buckwheat *(Eriogonum)* species is dominant in the canopy or is codominant with black sage or other coastal scrub species. The shrub canopy is sometimes over a higher cover of annual or perennial herbs such as bromes *(Bromus),* cryptantha *(Cryptantha),* wild oats *(Avena),* etc.

II.B.6.a. California buckwheat is dominant but other shrubs may be mixed in the canopy.

***Eriogonum fasciculatum* Alliance (3240)**

II.B.6.a.i. California buckwheat is usually the dominant shrub in the canopy, from along the coast to inland sites, though sometimes this buckwheat may codominate with deerweed *(Lotus scoparius).*

***Eriogonum fasciculatum* Association (3241)**

II.B.6.b. Ashy buckwheat occurs as the dominant low shrub but may be mixed with lower cover of other shrubs.

***Eriogonum cinereum* Alliance (3250)**

II.B.6.b.i. Ashy buckwheat dominates with a variable cover of annual and perennial herbs and grasses.

***Eriogonum cinereum* Association (3257)**

II.B.7. Shrubland in which California rockflower *(Crossosoma californicum)* is strongly dominant in the shrub overstory.

***Crossosoma californicum* Special Stands (3430)**

II.B.8 Coyote brush is dominant, often with shrubs of coastal sage, such as *Artemisia californica* and *Salvia leucophylla*, as subordinates. Sometimes coyote brush is codominant, usually in disturbed areas such as old fields, road banks, and stream and ravine borders.

***Baccharis pilularis* Alliance (2310)**

II.B.8.1. Coyote brush dominates over a mixture of native and nonnative annual grasses and herbs.

***Baccharis pilularis* Association (2311)**

II.B.8.2. Coyote brush dominates with California sagebrush as a subdominant. Purple sage and laurel sumac may be present.

***Baccharis pilularis-Artemisia californica* Association (2313)**

II.B.9. Cut-leaved goldenbush is the dominant low shrub usually with a mixture of herbs and grasses plus a low cover of other shrubs.

***Hazardia squarrosa* Alliance (3260)**
***Hazardia squarrosa* Association (3261)**

II.B.10. Menzies' goldenbush dominates with open or intermediate cover usually over an herbaceous layer.

***Isocoma menziesii* Alliance (3290),**
***Isocoma menziesii* Association (3291)**

II.B.11. Shrub canopy dominated by quail bush *(Atriplex lentiformis).*

***Atriplex lentiformis* Alliance (2330)**

II.B.11.1. The shrub canopy is usually dominated by quail bush but may have acacia and other shrubs present, and the understory is usually dominated by non-native herbs.

***Atriplex lentiformis* (disturbed) Association (2331)**

II.B.12. Shrub canopy dominated by coastal scrub species of unknown species composition, but obviously not dominated by other types of shrubs.

California Coastal Scrub Macrogroup (3000)

<u>Section III.</u> Vegetation strongly dominated by non-native coastal evergreen shrubs such as acacia *(Acacia* sp.*),* iceplant, etc*.*

III.A. A nonnative acacia strongly dominates stands (at >75% cover) in various areas.

***Acacia cyclops* (or other acacias) Semi-Natural Stands (9541)**

III.B. The low spreading and invasive succulent perennial sea fig (ice plant) is strongly dominant, usually on bluffs or dunes close to the ocean.

***Carpobrotus edulis* (or other iceplants) Semi-Natural Stands (9543)**

II.C. The overstory is strongly dominated (>75% relative cover) by other non-native shrub species, or which may be unknown but obviously not native shrubs.

Non-Native/Naturalized Mediterranean Scrub Vegetation (9540)

Class C. Herbaceous Vegetation (with Sections I, II and III).

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

I.A. Vegetation is dominated by a mixture of native perennial grasses and annuals, with the native grasses usually making up at least > 10% relative cover of the herbaceous layer.

I.A.1. Stands are usually on slopes associated with scrub or woodland vegetation dominated by the coarse, moderately tall giant wild rye (*Leymus condensatus*).

***Leymus condensatus* Alliance (4040)**

I.A.2. Native grass component is dominated by foothill needlegrass *(Nassella lepida)* alone or in shared dominance with other native and nonnative grasses and forbs. Stands are uncommon and may include emergent shrubs of the coastal sage scrub formation.

***Nassella lepida* Alliance (4090)**

I.A.3. Native grass component is usually mainly purple needlegrass *(Nassella pulchra),* and the annual component is a mixture of grasses and forbs.

Nassella pulchra Alliance (4020)

I.B. Grasslands or forblands are strongly dominated (>75% relative cover) by nonnative annual grasses and forbs including red brome, ripgut brome, wild oats, star thistle, and black mustard. There may be native species, but these may be relatively low cover.

I.B.1. Ripgut brome *(Bromus diandrus)* is abundant; however, an assortment of other forbs and grasses also usually occur in the stands including native species such as sun cup (*Camissonia* spp.), chamomile, common sand aster *(Lessingia filaginifolia),* etc.

***Bromus* (*diandrus*, *hordeaceus*) Semi-Natural Stands (4230)**

I.B.2. False brome *(Brachypodium distachyon)* is abundant or codominant with bromes, wild oats (*Avena* spp.), and other non-natives.

***Brachypodium distachyon* Semi-natural Stands(4231)**

I.B.3. Red brome (*Bromus rubens*) is abundant; however, an assortment of other herbs and grasses also usually occur in the stands.

***Bromus rubens*-Mixed Herb Semi-natural Stands (4240)**

I.B.4. Wild oats *(*e.g., *Avena fatua)* is dominant with lower cover of all other nonnative and native species.

***Avena (barbata, fatua)* Semi-Natural Stands (4220)**

I.B.5. Black mustard *(Brassica nigra)* is dominant or codominant in stands made up largely of other nonnative herbs and grasses.

***Brassica nigra* Semi-Natural Stands (4250)**

I.C.5.b. Ripgut brome and black mustard are both important or codominant in the stands, and other herbs may co-occur.

***Brassica nigra-Bromus diandrus* Semi-natural Stands (4251)**

I.C. Stands of vegetation dominated or codominated by medium to tall introduced perennial herbs including fennel *(Foeniculum)* and carnation weed (*Euphorbia terracina*).

I.C.1. Sweet fennel *(Foeniculum vulgare)* dominates usually weedy stands along road cuts and steep coastal slopes but also may be found in bottomlands on the edge of the Conejo Plain.

***Foeniculum vulgare* Semi-Natural Stands (4760)**

I.C.2. The noxious perennial carnation weed *Euphorbia terracina* dominates fields, fire clearance areas, and roadsides along the immediate coast.

***Euphorbia terracina* Semi-Natural Stands (4771)**

I.D. Stands obviously dominated by native or non-native herbaceous plants, but either different from above or of unknown species composition.

California Annual and Perennial Grassland Macrogroup (4000)

Section II. Vegetation dominated mainly by relatively low cover of perennial forbs, graminoids and shrubs of coastal environments including sea cliffs, dunes, rocky outcrops, and bluffs.

II.A. The low spreading and invasive succulent perennial sea fig (ice plant) is strongly dominant, usually on bluffs or dunes adjacent to the ocean.

***Carpobrotus edulis* (or other iceplants) Semi-Natural Stands (9543)**

II.B. Various annual and perennials (grasses, forbs, succulents), including *Dudleya* spp., as well as coastal scrubs occur on steep slopes or cliffs usually with a sparse cover (<10% total cover).

Steep Rocky Coastal Slope / Cliff (9001)

Section III. Vegetation is dominated by wetland graminoid and forb species including cattail *(Typha),* rush *(Juncus),* sedge *(Carex),* giant reed grass *(Arundo),* or other species. Woody species cover < 10% of the ground surface.

III.A. Stands in freshwater environments dominated with > 30% absolute cover of wetland plants including cattails *(Typha)*, bulrushes and tules *(Scirpus/Schoenoplectus),* rushes *(Juncus),* etc.

Freshwater Marsh/Wetland Macrogroup in Western North America (4400)

III.B. Vegetation in alkaline or saline environments dominated by dominated by other forbs and graminoids

Alkali/Saline Wetland Macrogroup in Mediterranean/Semi-Desert California (4500)