

# **Vegetation Mapping of the Santa Susana Mountains – a portion of the Simi-Valley-Santa Susana Mountains Ecological Subsection of the Southern California Coast Ecological Section**

## **Final Performance Report – Phase 2**

**Submitted to U.S. Fish and Wildlife Service – Carlsbad Office  
December 31, 2023**



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*U.S. Fish and Wildlife Service (USFWS) Cooperative Funding Agreement:*  
F20AC10966-00

*Funding Title:* Santa Susana Mountains - Simi Valley Vegetation Mapping Project  
Mapping of 48,700 acres of vegetation for a portion of the Simi Valley-Santa Susana  
Mountains ecological subsection to support the conservation of the coastal California  
gnatcatcher.

*Phase 2 Funding Total:* \$95,000

*Project Proponent:* USFWS CFDA Program 15.657 – Endangered Species  
Conservation – Recovery Implementation Funds

*Period of Performance for entire project:* October 1, 2020 through December 31, 2023

*Funding Period Phase 2:* October 1, 2020 through December 31, 2023

*Cover Photo Credit:* Edward Reyes

## **Acknowledgements:**

### **USFWS**

*Carlsbad:* William Miller, Susan Wynn

*Ventura:* Chris Dellith, Mark Elvin, and Chris Diel

### **Vegetation Classification and Field Reconnaissance**

*California Department of Fish and Wildlife (CDFW):* Todd Keeler-Wolf

### **Land Permissions, Accessibility, and Road Conditions**

*Bureau of Land Management:* Jonathan Carvella, Chelsea Collins, James K. Gannon

*California Resources Corporation:* Eldon Bingham

*Cal-NRG:* Ken Bork, Johnny Virto

*City of Santa Clarita:* Dan Duncan

*County of Ventura:* Pam Lindsey

*Mountains Recreation and Conservation Authority (MRCA):* Paul Edelman, Marc  
Shores, and, Jodi Thomas

*Private Landowners:* David and Ellen Bunn

*The Nature Conservancy:* Peter Dixon, Kat Selm

### **Vegetation Mapping**

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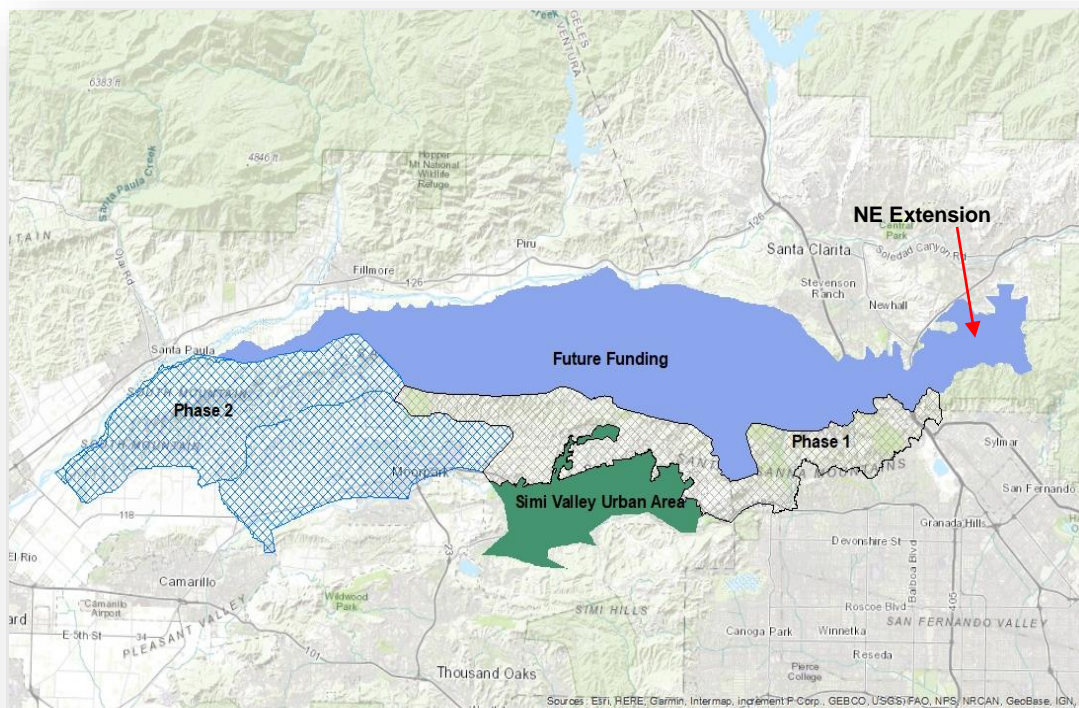
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# Introduction

The US Fish and Wildlife Service (USFWS) has an interest in completing the fine-scale vegetation mapping of the remainder of the Simi Valley-Santa Susana Mountains Ecological Subsection of the Southern California Coast Ecological Section (total Project size approximately 155,519 acres). AIS, under a separate contract with the National Park Service (NPS), had completed a large portion of the subsection as part of Santa Monica Mountains National Recreation Area (SAMO) vegetation mapping effort. However, USFWS has had limited funding available so the Project was divided into multiple parts based on funding allotments. Phase 1 - previously allocated funding to develop the floristic classification and mapping of 28,900 acres, conducted in 2019, Phase 2 - current allocation of funds to map an additional 48,700 acres, conducted in 2021-23, and “Future Funding” Phases that are required to map the remainder of the area and expand the classification development to include the Northeast Extension Area (See figure 1 below), when funding becomes available.

This Final Performance Report is a summary of the work completed in Phase 2 and not a final Project report, as the tasks needed to complete the mapping, accuracy assessment, and final report were not funded as part of this portion of the Project. This report will describe the methodology and work completed for the Phase 2 effort, which is a continuation of the work completed under Phase 1.



**Figure 1:** Phase 1 Study Area (grey cross-hatched area), Phase 2 Study Area (blue cross hatched area), Future Funding area (solid filled lavender) includes the remainder of the Santa Susana Mountains and NE Extension, and the Simi Valley Urban Area (green).

## Phase 2: Vegetation Mapping

### *Objectives and Methods*

A portion of the overall study area was selected to continue infilling vegetation data through the mapping process started in the Phase 1 effort (Task 3 in the full project outline). Because of funding limitations, Phase 2 added 48,700 acres to the 28,900 acres completed during Phase 1 for a total of 77,600 acres of the entire 155,519-acre Project area. The Phase 1 and 2 data completed thus far is not considered a “final” product since ground-truth reconnaissance of Phase 1, accuracy assessment (AA), final data processing and the overall Project final report and metadata creation have not been funded. However, users may find the interim data useful for habitat modeling and/or other land management planning purposes.

During Project initiation and set up, the team of photo interpreters and GIS staff inventory and organize the Project materials and prepare those materials into a format suitable for production mapping. GIS staff also create Project workspaces, modify existing ArcGIS tool sets, create Project specific coding menus to facilitate the photointerpretation effort, and divide the study area into working production modules. Having individual production modules allow multiple people to work on the data simultaneously and arranges the Project materials into smaller, more manageable pieces to expedite the production mapping process.

The mapping classification for Phase 2 is based on the vegetation classification already developed as part of Phase 1 – Tasks 1 and 2. Map units (vegetation type) are classified to the Alliance-level. In addition to the vegetation type, polygons mapped are based on their percent cover by vegetation life form, hardwood, conifer, shrub, and herbaceous components. Other attributes such as disturbance impact level, exotic impact level, and land use are attributed to the delineated polygons but are not themselves line formers. Upon completion of the entire Project, the vegetation map units will be cross walked to populate other attributes such as the California Wildlife Habitat Relations (CWHR) modal tree size, tree height, etc., in the final geodatabase.

Field reconnaissance is conducted prior to mapping and serves multiple functions. Field visits enable the photo interpreters to relate the vegetation on the ground at each reconnaissance observation site to the signatures on the aerial imagery. They provide an opportunity for the ecologists and photo interpreters to spend time together in the field to become familiar with the flora, vegetation assemblages, and local ecology of the study area. This interchange also gives one a better understanding, from the photo interpreters' perspective, of vegetation assessment through the framework of map creation. Subsequent field visits are also used to help answer photointerpretation questions that may arise during the mapping effort (ground-truth reconnaissance). Site visits are documented with geographic locations, field notes, and ground photos, further enhancing the photo interpreters' ability to accurately map the vegetation. As part of Phase 2, one field reconnaissance visit was conducted prior the mapping process, and a ground-truth reconnaissance followed after the mapping process was completed to

answer questions encountered during the mapping process. It is important to note that due to prior funding constraints only one field reconnaissance visit was included as part of Phase 1. Further ground-truth visits will be needed to answer mapping questions in Phase 1 to finalized the mapping in that portion of the study area.

Mapping conducted by experienced photo interpreters with knowledge of vegetation communities, good reference sources, as well as the use of appropriate GIS tools, are all essential in creating a quality vegetation map. Equally important is the development of the set of decision-making rules, or mapping criteria, to ensure the accuracy and consistency of map delineations and attributes. The mapping criteria contains the Project guidelines and rules regarding criteria exceptions, special situations, and minimum polygon size, and will be documented in the final Project report after mapping of the remainder of the future study area is completed.

For the Phase 1 and 2 mapping, established statewide standard guidelines are used. Statewide standard for minimum mapping unit (MMU) size is 1 acre for upland types and ¼ acre for wetland and riparian types. Any changes or additions to criteria are discussed and agreed upon by the Project team, and disseminated to all staff members, as needed, during the photointerpretation effort.

Photo interpreters delineate and attribute vegetation unit polygons using heads-up digitizing techniques, while viewing the Project base imagery on-screen. The mapping consists of two distinct aspects, the “photointerpretation process” and the “mapping process.” During the photointerpretation process the interpreters apply their understanding of photo signatures (defined by the color, texture, tone, size, and pattern exhibited on the aerial imagery) and knowledge of the geographic characteristics of ground features to formulate a reasoned decision about how to represent a feature and what to call it. The “mapping process” involves the creation of the digital geodatabase through the use of computer hardware and software. In other words, the mapping process captures for subsequent users a permanent record of the results of the photointerpretation process. Both aspects happen simultaneously as a map is created.

Just as the use of mental models by experienced photo interpreters contributes to the production of a high-quality vegetation map, the use of established mapping procedures allow for the map to be produced in a highly efficient manner. Photo interpreters have at their disposal a suite of standard and custom ArcMap tools to facilitate the creation of polygons. They also reference supplemental imagery from various years and seasonality, vegetation field data, and other data, such as elevation contours and fire history, to help in their polygon delineations and attribution.

To ensure the accuracy and completeness of the interpretations, a comprehensive quality control (QC) review is performed to ensure delineations and codes adhere to the Project criteria and classification. QC is an iterative process, conducted at many phases of the mapping effort.

A senior staff member reviews the completed map datasets to verify accuracy and consistency among interpreters, looking for completeness, uncoded polygons,

unnecessary boundaries, and how well the delineations match the imagery. In addition, the modules will be subjected to a series of automated GIS checks, which flag any instances of invalid codes, uncoded polygons, unnecessary boundaries, illogical code combinations, or topology problems. All errors found are corrected.

When the completed modules are joined, they are edge-matched, with any discrepancies at the edges between modules corrected, and any changes applied throughout the modules. This edge-matching is also done in the areas previously mapped for other projects, such as the existing vegetation data for the SAMO and mapping completed during Phase 1. With all the individual production modules joined together, one last quality control review is conducted on the geodatabase prior to final delivery ensuring a seamless and complete map product.

### *Work Completed*

During the Project initiation phase AIS in collaboration with USFWS determined the Phase 2 study area for mapping. The study area was divided into three working modules. All pertinent materials and data files were acquired. The base for mapping was the 2020 NAIP natural color and color infrared imagery. The 2018 NAIP imagery (used for Phase 1), as well as Google Earth, was also available for reference. Fire perimeter files, the Phase 1 classification survey data, land access files, road files, and geology were also obtained.

The AIS mapping classification was based on the vegetation classification developed by CNPS for Phase 1. Other miscellaneous non-vegetation map classes not accounted for by the floristic vegetation classification were added. Mapping criteria is based on the CDFW state standard for vegetation mapping. The mapping class criteria for mapping is based on the vegetation key developed by CNPS during the classification analysis process completed under Phase 1. The vegetation key becomes the basis for photointerpretation criteria and map class descriptions. As a result of observations during the field reconnaissance and use of the key during the mapping process, collaboration between the AIS mapping staff and the CDFW ecologist(s), updates and revisions to the key were incorporated to reflect new information or clarifications.

Two four-day field reconnaissance/verification trips were conducted for the Phase 2 study area. Two AIS staff and Dr. Todd Keeler-Wolf (CDFW retired) traveled throughout accessible portions of the study area. AIS was in contact with personnel from the Mountains Recreation and Conservation Authority, City of Santa Clarita, Bureau of Land Management, California Resources Corporation/Cal-NRG, and The Nature Conservancy (TNC) in assessing accessibility, road conditions, and permission to access their properties. Private land was not accessible other than The California Resources Corporation/Cal-NRG oil and gas field and TNC land, which was accessed with permission to cross a private parcel. The field reconnaissance trip was conducted

in mid-September 2021 and a four-day ground-truth reconnaissance trip was conducted in early May 2022. The reconnaissance reports are found in Appendix E.

The vegetation photointerpretation and mapping was conducted by AIS. Two photo interpreters, including one senior staff conducted the mapping of the three Phase 2 modules. Both staff had completed the mapping for Phase 1 and were also present on the Phase 2 field reconnaissance and ground truthing trips. Communication and collaboration between the two mappers and field ecologist(s) continued for the duration of the mapping effort. Any vegetation classification or criteria issues were discussed and resolved through communication with CNPS, CDFW staff, and/or Todd Keeler-Wolf.

Since field reconnaissance trips were conducted on only a portion (Phase 1 and 2) of the entire Project study area, there remain some issues regarding trends of certain types across the entire Project area that need further discussion and field observations in other areas of the Project study area. These additional field reconnaissance and verification trips will need to be conducted as future funding becomes available.

AIS completed the GIS processing for the Phase 2 study area in order to provide USFWS with a “useable” GIS geodatabase. After the 3 separate modules were joined and module boundaries dissolved, diagnostic GIS checks were conducted. A visual overview of the attribute table was done to find any obvious inconsistencies between attribute field value correlations. A type-by-type onscreen review was conducted in a search for anomalies. Any incongruities found were either reassessed and/or recoded as appropriate. Consistency between mappers was also checked. Although not part of the Phase 1 funding, the final GIS processing of the Phase 1 data was previously completed to provide USFWS with a useable dataset. This geodatabase was joined to the Phase 2 data to form one seamless dataset of the combined Phase 1 and 2 vegetation data.

For the combined Phase 1 and 2 mapping study area, 2 macrogroup level, 3 group level, 45 alliance level, and 16 Mapping Unit types were mapped for a total of 66 classes. Table 1 below summarizes the types mapped, as well as acres for each type.

The schema for the interim Combined Phase 1 and 2 vegetation geodatabase is provided in Appendix A. The preliminary version of the mapping classification hierarchy, as well as an alphabetical and numeric classification short list by life form is provided in Appendices B, C, and D. A “final version” of the mapping classification, map class descriptions, and the vegetation key will be provided in the final report documentation after the completion of the entire Project.

The interim Phase 1 and 2 vegetation map geodatabase (SASU\_Phase1and2\_Preliminary\_20220811.gdb) is provided as part of this task.



**Table 1: Summary of Phase 2 Mapped Classes by Type (listed Numerically by Map Unit Code)**

Map Unit	Description	Area (ac.)	% of Total Area (ac.)	# of Polygons	Average Polygon Size (ac.)
1111	<i>Juglans californica</i> Alliance	395.9	0.8%	157	2.5
1112	<i>Quercus agrifolia</i> Alliance	916.5	1.9%	220	4.2
1211	<i>Eucalyptus</i> spp. - <i>Ailanthus altissima</i> - <i>Robinia pseudoacacia</i> Alliance	237.7	0.5%	74	3.2
1212	<i>Schinus (molle, terebinthifolius)</i> - <i>Myoporum laetum</i> Alliance	272.0	0.6%	171	1.6
1411	<i>Platanus racemosa</i> - <i>Quercus agrifolia</i> Alliance	23.1	0.0%	21	1.1
1412	<i>Salix gooddingii</i> - <i>Salix laevigata</i> Alliance	250.0	0.5%	73	3.4
1413	<i>Populus fremontii</i> - <i>Fraxinus velutina</i> - <i>Salix gooddingii</i> Alliance	3.8	0.0%	3	1.3
1511	<i>Tamarix</i> spp. Alliance	3.2	0.0%	5	0.6
1512	<i>Nicotiana glauca</i> Alliance	7.6	0.0%	6	1.3
1611	<i>Populus trichocarpa</i> Alliance	6.7	0.0%	8	0.8
2100	Californian Annual & Perennial Grassland Macrogroup	4,532.4	9.3%	377	12.0
2112	<i>Leymus condensatus</i> Alliance	19.5	0.0%	14	1.4
2122	<i>Lasthenia californica</i> - <i>Plantago erecta</i> - <i>Vulpia microstachys</i> Alliance	0.3	0.0%	1	0.3
2211	<i>Malosma laurina</i> Alliance	749.9	1.5%	74	10.1
2212	<i>Rhus integrifolia</i> Alliance	745.5	1.5%	302	2.5
2223	<i>Cercocarpus montanus</i> Alliance	0.7	0.0%	1	0.7
2224	<i>Prunus ilicifolia</i> - <i>Heteromeles arbutifolia</i> - <i>Ceanothus spinosus</i> Alliance	65.3	0.1%	20	3.3
2225	<i>Quercus berberidifolia</i> Alliance	3.3	0.0%	1	3.3
2231	<i>Adenostoma fasciculatum</i> Alliance	193.3	0.4%	43	4.5
2232	<i>Adenostoma fasciculatum</i> - <i>Salvia</i> spp. Alliance	117.5	0.2%	21	5.6
2234	<i>Ceanothus megacarpus</i> Alliance	68.7	0.1%	16	4.3
2313	<i>Hazardia squarrosa</i> - <i>Ericameria palmeri</i> Alliance	7.1	0.0%	4	1.8
2314	<i>Lotus scoparius</i> - <i>Lupinus albifrons</i> - <i>Eriodictyon</i> spp. Alliance	87.9	0.2%	26	3.4
2315	<i>Malacothamnus fasciculatus</i> - <i>Malacothamnus</i> spp. Alliance	59.5	0.1%	28	2.1
2321	<i>Baccharis pilularis</i> Alliance	171.3	0.4%	110	1.6
2322	<i>Toxicodendron diversilobum</i> Alliance	34.5	0.1%	30	1.1
2331	<i>Artemisa californica</i> - <i>Salvia leucophylla</i> Alliance	6,404.1	13.1%	1163	5.5
2332	<i>Encelia californica</i> - <i>Eriogonum cinereum</i> Alliance	919.0	1.9%	290	3.2
2333	<i>Eriogonum fasciculatum</i> - <i>Salvia apiana</i> Alliance	413.9	0.8%	149	2.8
2334	<i>Salvia mellifera</i> - <i>Artemisia californica</i> Alliance	113.2	0.2%	38	3.0
2410	Californian Ruderal Grassland, Meadow & Scrub Group	1,837.3	3.8%	242	7.6
3212	<i>Typha (angustifolia, domingensis, latifolia)</i> Alliance	0.7	0.0%	2	0.3
3311	<i>Phragmites australis</i> - <i>Arundo donax</i> Alliance	55.0	0.1%	27	2.0
3511	<i>Baccharis salicifolia</i> Alliance	267.9	0.6%	114	2.4
3513	<i>Salix lasiolepis</i> Alliance	13.7	0.0%	5	2.7
3514	<i>Sambucus nigra</i> Alliance	153.5	0.3%	208	0.7
3622	<i>Atriplex lentiformis</i> Alliance	22.8	0.0%	22	1.0
4111	<i>Opuntia littoralis</i> - <i>Opuntia oricola</i> - <i>Cylindropuntia prolifera</i> Alliance	269.9	0.6%	120	2.2
4311	<i>Lepidospartum squamatum</i> Alliance	67.2	0.1%	10	6.7
6110	Californian Cliff, Scree & Rock Vegetation Group	89.9	0.2%	51	1.8
6112	<i>Dudleya cymosa</i> - <i>Dudleya lanceolata</i> - Lichen/Moss Alliance	2.0	0.0%	2	1.0
9110	Cleared Land Mapping Unit	166.3	0.3%	38	4.4
9120	Sand/Gravel Bar Mapping Unit	1.6	0.0%	2	0.8
9130	Rocky Streambed Mapping Unit	11.1	0.0%	5	2.2
9200	Agriculture Mapping Unit	14,399.1	29.6%	207	69.6
9300	Urban MU	7,168.5	14.7%	532	13.5
9400	Exotic or Planted Trees and Shrubs Mapping Unit	21.8	0.0%	13	1.7
9500	Artificial Cuts/Embankments Mapping Unit	2.1	0.0%	1	2.1
9510	Artificial Cuts/Embankments - Exotic Mapping Unit	112.7	0.2%	7	16.1
9520	Artificial Cuts/Embankments - Trees Mapping Unit	0.7	0.0%	1	0.7
9530	Artificial Cuts/Embankments - Shrubs Mapping Unit	2.8	0.0%	1	2.8
9531	Artificial Cuts/Embankments - Coastal Sage Scrub Mapping Unit	121.1	0.2%	18	6.7
9700	Post-Fire Mapping Unit	6,979.8	14.3%	26	268.5
9800	Water Mapping Unit	96.2	0.2%	35	2.7
9801	Small Earthen Dammed Ponds	20.1	0.0%	5	4.0
Total Area		48,707.0	100.0%	5,140	9.5

Table 2: Summary of Phase 2 Mapped Classes by Type (listed Alphabetically by Map Unit Description)

Map Unit	Description	Area (ac.)	% of Total Area (ac.)	# of Polygons	Average Polygon Size (ac.)
2232	<i>Adenostoma fasciculatum</i> - <i>Salvia</i> spp. Alliance	117.5	0.2%	21	5.6
2231	<i>Adenostoma fasciculatum</i> Alliance	193.3	0.4%	43	4.5
9200	Agriculture Mapping Unit	14,399.1	29.6%	207	69.6
2331	<i>Artemisa californica</i> - <i>Salvia leucophylla</i> Alliance	6,404.1	13.1%	1163	5.5
9531	Artificial Cuts/Embankments - Coastal Sage Scrub Mapping Unit	121.1	0.2%	18	6.7
9510	Artificial Cuts/Embankments - Exotic Mapping Unit	112.7	0.2%	7	16.1
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9520	Artificial Cuts/Embankments - Trees Mapping Unit	0.7	0.0%	1	0.7
9500	Artificial Cuts/Embankments Mapping Unit	2.1	0.0%	1	2.1
3622	<i>Atriplex lentiformis</i> Alliance	22.8	0.0%	22	1.0
2321	<i>Baccharis pilularis</i> Alliance	171.3	0.4%	110	1.6
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2223	<i>Cercocarpus montanus</i> Alliance	0.7	0.0%	1	0.7
9110	Cleared Land Mapping Unit	166.3	0.3%	38	4.4
6112	<i>Dudleya cymosa</i> - <i>Dudleya lanceolata</i> - Lichen/Moss Alliance	2.0	0.0%	2	1.0
2332	<i>Encelia californica</i> - <i>Eriogonum cinereum</i> Alliance	919.0	1.9%	290	3.2
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9400	Exotic or Planted Trees and Shrubs Mapping Unit	21.8	0.0%	13	1.7
2313	<i>Hazardia squarrosa</i> - <i>Ericameria palmeri</i> Alliance	7.1	0.0%	4	1.8
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2212	<i>Rhus integrifolia</i> Alliance	745.5	1.5%	302	2.5
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1412	<i>Salix gooddingii</i> - <i>Salix laevigata</i> Alliance	250.0	0.5%	73	3.4
3513	<i>Salix lasiolepis</i> Alliance	13.7	0.0%	5	2.7
2334	<i>Salvia mellifera</i> - <i>Artemisia californica</i> Alliance	113.2	0.2%	38	3.0
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1212	<i>Schinus (molle, terebinthifolius)</i> - <i>Myoporum laetum</i> Alliance	272.0	0.6%	171	1.6
9801	Small Earthen Dammed Ponds	20.1	0.0%	5	4.0
1511	<i>Tamarix</i> spp. Alliance	3.2	0.0%	5	0.6
2322	<i>Toxicodendron diversilobum</i> Alliance	34.5	0.1%	30	1.1
3212	<i>Typha (angustifolia, domingensis, latifolia)</i> Alliance	0.7	0.0%	2	0.3
9300	Urban MU	7,168.5	14.7%	532	13.5
9800	Water Mapping Unit	96.2	0.2%	35	2.7
Total Area		48,707.0	100.0%	5,140	9.5



Table 3: Summary of Phase 2 Mapped Classes by Type (listed by Acres high to low)

Map Unit	Description	Area (ac.)	% of Total Area (ac.)	# of Polygons	Average Polygon Size (ac.)
9200	Agriculture Mapping Unit	14,399.1	29.6%	207	69.6
9300	Urban MU	7,168.5	14.7%	532	13.5
9700	Post-Fire Mapping Unit	6,979.8	14.3%	26	268.5
2331	Artemisa californica - Salvia leucophylla Alliance	6,404.1	13.1%	1163	5.5
2100	Californian Annual & Perennial Grassland Macrogroup	4,532.4	9.3%	377	12.0
2410	Californian Ruderal Grassland, Meadow & Scrub Group	1,837.3	3.8%	242	7.6
2332	Encelia californica - Eriogonum cinereum Alliance	919.0	1.9%	290	3.2
1112	Quercus agrifolia Alliance	916.5	1.9%	220	4.2
2211	Malosma laurina Alliance	749.9	1.5%	74	10.1
2212	Rhus integrifolia Alliance	745.5	1.5%	302	2.5
2333	Eriogonum fasciculatum - Salvia apiana Alliance	413.9	0.8%	149	2.8
1111	Juglans californica Alliance	395.9	0.8%	157	2.5
1212	Schinus (molle, terebinthifolius) - Myoporum laetum Alliance	272.0	0.6%	171	1.6
4111	Opuntia littoralis - Opuntia oricola - Cylindropuntia prolifera Alliance	269.9	0.6%	120	2.2
3511	Baccharis salicifolia Alliance	267.9	0.6%	114	2.4
1412	Salix gooddingii - Salix laevigata Alliance	250.0	0.5%	73	3.4
1211	Eucalyptus spp. - Ailanthus altissima - Robinia pseudoacacia Alliance	237.7	0.5%	74	3.2
2231	Adenostoma fasciculatum Alliance	193.3	0.4%	43	4.5
2321	Baccharis pilularis Alliance	171.3	0.4%	110	1.6
9110	Cleared Land Mapping Unit	166.3	0.3%	38	4.4
3514	Sambucus nigra Alliance	153.5	0.3%	208	0.7
9531	Artificial Cuts/Embankments - Coastal Sage Scrub Mapping Unit	121.1	0.2%	18	6.7
2232	Adenostoma fasciculatum - Salvia spp. Alliance	117.5	0.2%	21	5.6
2334	Salvia mellifera - Artemisia californica Alliance	113.2	0.2%	38	3.0
9510	Artificial Cuts/Embankments - Exotic Mapping Unit	112.7	0.2%	7	16.1
9800	Water Mapping Unit	96.2	0.2%	35	2.7
6110	Californian Cliff, Scree & Rock Vegetation Group	89.9	0.2%	51	1.8
2314	Lotus scoparius - Lupinus albus - Eriodictyon spp. Alliance	87.9	0.2%	26	3.4
2234	Ceanothus megacarpus Alliance	68.7	0.1%	16	4.3
4311	Lepidospartum squamatum Alliance	67.2	0.1%	10	6.7
2224	Prunus ilicifolia - Heteromeles arbutifolia - Ceanothus spinosus Alliance	65.3	0.1%	20	3.3
2315	Malacothamnus fasciculatus - Malacothamnus spp. Alliance	59.5	0.1%	28	2.1
3311	Phragmites australis - Arundo donax Alliance	55.0	0.1%	27	2.0
2322	Toxicodendron diversilobum Alliance	34.5	0.1%	30	1.1
1411	Platanus racemosa - Quercus agrifolia Alliance	23.1	0.0%	21	1.1
3622	Atriplex lentiformis Alliance	22.8	0.0%	22	1.0
9400	Exotic or Planted Trees and Shrubs Mapping Unit	21.8	0.0%	13	1.7
9801	Small Earthen Dammed Ponds	20.1	0.0%	5	4.0
2112	Leymus condensatus Alliance	19.5	0.0%	14	1.4
3513	Salix lasiolepis Alliance	13.7	0.0%	5	2.7
9130	Rocky Streambed Mapping Unit	11.1	0.0%	5	2.2
1512	Nicotiana glauca Alliance	7.6	0.0%	6	1.3
2313	Hazardia squarrosa - Ericameria palmeri Alliance	7.1	0.0%	4	1.8
1611	Populus trichocarpa Alliance	6.7	0.0%	8	0.8
1413	Populus fremontii - Fraxinus velutina - Salix gooddingii Alliance	3.8	0.0%	3	1.3
2225	Quercus berberidifolia Alliance	3.3	0.0%	1	3.3
1511	Tamarix spp. Alliance	3.2	0.0%	5	0.6
9530	Artificial Cuts/Embankments - Shrubs Mapping Unit	2.8	0.0%	1	2.8
9500	Artificial Cuts/Embankments Mapping Unit	2.1	0.0%	1	2.1
6112	Dudleya cymosa - Dudleya lanceolata - Lichen/Moss Alliance	2.0	0.0%	2	1.0
9120	Sand/Gravel Bar Mapping Unit	1.6	0.0%	2	0.8
2223	Cercocarpus montanus Alliance	0.7	0.0%	1	0.7
3212	Typha (angustifolia, domingensis, latifolia) Alliance	0.7	0.0%	2	0.3
9520	Artificial Cuts/Embankments - Trees Mapping Unit	0.7	0.0%	1	0.7
2122	Lasthenia californica - Plantago erecta - Vulpia microstachys Alliance	0.3	0.0%	1	0.3
Total Area		48,707.0	100.0%	5,140	9.5

**Table 4: Summary of Phase 1 and 2 (combined) Mapped Classes by Type (listed by Acres high to low)**

Map Unit	Description	Phase 1		Phase 2		Combined Phases	
		# of Polygons	Total Area (ac.)	# of Polygons	Total Area (ac.)	# of Polygons	Total Area (ac.)
9200	Agriculture Mapping Unit	2	63.5	207	14,399.1	209	14,462.6
9300	Urban MU	136	2,443.1	532	7,158.5	668	9,611.6
2100	Californian Annual & Perennial Grassland Macrogroup	555	4,348.0	377	4,532.4	932	8,880.4
2331	Artemisa californica - Salvia leucophylla Alliance	411	2,366.7	1163	6,404.1	1574	8,770.8
9700	Post-Fire Mapping Unit	1	1.7	26	6,979.8	27	6,981.6
2232	Adenostoma fasciculatum - Salvia spp. Alliance	338	5,827.4	21	117.5	359	5,944.8
2334	Salvia mellifera - Artemisia californica Alliance	513	3,879.6	38	113.2	551	3,992.8
2332	Encelia californica - Eriogonum cinereum Alliance	269	2,183.3	290	919.0	559	3,102.3
2410	Californian Ruderal Grassland, Meadow & Scrub Group	88	599.9	242	1,837.3	330	2,437.2
1112	Quercus agrifolia Alliance	226	814.3	220	916.5	446	1,730.8
1111	Juglans californica Alliance	247	1,284.2	157	395.9	404	1,680.2
2211	Malosma laurina Alliance	185	881.4	74	749.9	259	1,631.3
2231	Adenostoma fasciculatum Alliance	91	843.0	43	193.3	134	1,036.3
2212	Rhus integrifolia Alliance	18	71.6	302	745.5	320	817.1
2333	Eriogonum fasciculatum - Salvia apiana Alliance	149	385.1	149	413.9	298	799.1
2224	Prunus ilicifolia - Heteromeles arbutifolia - Ceanothus spinosus Alliance	126	574.3	20	65.3	146	639.6
2315	Malacothamnus fasciculatus - Malacothamnus spp. Alliance	108	400.4	28	59.5	136	459.8
1411	Platanus racemosa - Quercus agrifolia Alliance	76	421.6	21	23.1	97	444.7
3511	Baccharis salicifolia Alliance	68	153.0	114	267.9	182	420.9
1412	Salix gooddingii - Salix laevigata Alliance	58	134.9	73	250.0	131	384.9
2234	Ceanothus megacarpus Alliance	54	305.0	16	68.7	70	373.6
4111	Opuntia littoralis - Opuntia oricola - Cylindropuntia prolifera Alliance	7	4.6	120	269.9	127	274.5
1212	Schinus (molle, terebinthifolius) - Myoporum laetum Alliance	1	1.0	171	272.0	172	272.9
1211	Eucalyptus spp. - Ailanthus altissima - Robinia pseudoacacia Alliance	16	32.8	74	237.7	90	270.5
9110	Cleared Land Mapping Unit	19	79.6	38	166.3	57	245.8
9531	Artificial Cuts/Embankments - Coastal Sage Scrub Mapping Unit	25	101.1	18	121.1	43	222.3
3514	Sambucus nigra Alliance	26	28.8	208	153.5	234	182.2
2321	Baccharis pilularis Alliance			110	171.3	110	171.3
9510	Artificial Cuts/Embankments - Exotic Mapping Unit	1	6.7	7	112.7	8	119.4
2314	Lotus scoparius - Lupinus albusfrons - Eriodictyon spp. Alliance	13	23.1	26	87.9	39	110.9
6110	Californian Cliff, Scree & Rock Vegetation Group	13	18.5	51	89.9	64	108.4
4311	Lepidospartum squamatum Alliance	11	39.6	10	67.2	21	106.8
9800	Water Mapping Unit	1	0.3	35	96.2	36	96.5
1113	Quercus lobata Alliance	37	91.3			37	91.3
1311	Pseudestuga macrocarpa Alliance	15	65.4			15	65.4
2223	Cercocarpus montanus Alliance	10	63.3	1	0.7	11	64.0
2233	Ceanothus crassifolius Alliance	16	62.2			16	62.2
9540	Artificial Cuts/Embankments - Herbaceous to Sparsely Vegetated Mapping Unit	20	61.8			20	61.8
9400	Exotic or Planted Trees and Shrubs Mapping Unit	9	36.1	13	21.8	22	57.9
3311	Phragmites australis - Arundo donax Alliance	8	2.6	27	55.0	35	57.6
3513	Salix lasiolepis Alliance	30	37.9	5	13.7	35	51.6
9530	Artificial Cuts/Embankments - Shrubs Mapping Unit	11	47.2	1	2.8	12	50.0
6111	Selaginella bigelovii Alliance	10	42.3			10	42.3
1413	Populus fremontii - Fraxinus velutina - Salix gooddingii Alliance	7	38.3	3	3.8	10	42.1
9801	Small Earthen Dammed Ponds	8	16.4	5	20.1	13	36.4
2322	Toxicodendron diversilobum Alliance	3	1.3	30	34.5	33	35.8
2225	Quercus berberidifolia Alliance	12	27.4	1	3.3	13	30.7
3622	Atriplex lentiformis Alliance	6	5.9	22	22.8	28	28.6
9520	Artificial Cuts/Embankments - Trees Mapping Unit	7	27.7	1	0.7	8	28.4
2511	Rhus ovata Alliance	9	21.1			9	21.1
2112	Leymus condensatus Alliance	1	0.3	14	19.5	15	19.8
9130	Rocky Streambed Mapping Unit			5	11.1	5	11.1
1512	Nicotiana glauca Alliance	1	0.4	6	7.6	7	8.0
9500	Artificial Cuts/Embankments Mapping Unit	2	5.2	1	2.1	3	7.3
2313	Hazardia squarrosa - Ericameria palmeri Alliance			4	7.1	4	7.1
1611	Populus trichocarpa Alliance			8	6.7	8	6.7
1511	Tamarix spp. Alliance	3	2.2	5	3.2	8	5.4
2711	Isocoma menziesii	3	2.8			3	2.8
3212	Typha (angustifolia, domingensis, latifolia) Alliance	1	1.5	2	0.7	3	2.2
6112	Dudleya cymosa - Dudleya lanceolata - Lichen/Moss Alliance			2	2.0	2	2.0
9120	Sand/Gravel Bar Mapping Unit			2	1.6	2	1.6
9100	Sparsely Vegetated to Non-vegetated Mapping Unit	1	1.2			1	1.2
2330	Central & Southern Californian Coastal Sage Scrub Group	1	1.0			1	1.0
2122	Lasthenia californica - Plantago erecta - Vulpia microstachys Alliance			1	0.3	1	0.3
3512	Salix exigua Alliance	1	0.3			1	0.3
3400	Western North American Vernal Pool Macrogroup	1	0.2			1	0.2
Grand Total		4085	28,981.4	5140	48,707.0	9225	77,688.4

## Deliverables

1. Preliminary Mapping Classification Hierarchy\_4-19-2019 (AIS) (Appendices B, C, and D, and delivered as separate digital files)

Outline of the final Phase 1 and 2 version of the alliance level hierarchical mapping classification for the project, with associations and Mapping Units also listed. It was derived from the Vegetation Classification (part of Phase 1 deliverables) provided by CNPS. The classification contains potential alliance types that may be found and mapped in the study area and is based on the alliances/associations assigned to survey plots used in the classification analysis and plots outside, but near the study area (5-kilometer buffer). The document is updated as mapping progresses if types not listed are encountered, after discussion with CNPS and/or CDFW. Upon completion of the entire Project study area, a final Project report with mapping class type descriptions will be provided (currently not funded for Phase 1 or 2).

2. SASU key draft\_20190422.docx (CNPS) (Appendix G and delivered as separate digital file)

A dichotomous field key written to assist users in identifying the vegetation alliances and associations of the Santa Susana Mountains. It is based on the classification of data collected in 2018 by CNPS, as well as additional supporting data collected for the Santa Monica Mountains NRA between 2003 and 2009, and two additional data points collected in 2015 by Rancho Santa Ana Botanic Garden. Types collected outside of the Simi Valley - Santa Susana Mountains project area may potentially occur in the study area. The key will be updated where the inclusion of additional survey data, collected as part of the remainder of the Project yet to be funded, results in new types. As mapping progresses, the photo interpreters may have questions for CNPS/CDFW regarding some survey plots or key descriptions, which may result in a change of alliance or association assignment of the plot, and potentially a modification of the key description.

3. Vegetation Database Phase 1 and 2 combined (SASU\_Phase1and2\_Preliminary\_20220811.gdb) (AIS) (Delivered as separate digital file)

Vegetation geodatabase for Phase 1 and 2 portions of the Project study area compiled by AIS through photointerpretation and mapping using ArcMap.

Although not a deliverable, the Manual of California Vegetation Online (CNPS) (Available online at <http://vegetation.cnps.org/>) contains useful information to supplement the information provided in the other documents. It should be noted that the online Manual may not reflect current classification parameters since it is not updated on a frequent basis.

## **Appendix A: Schema for Phase 1 and 2 (AIS)**

ObjectID – Phase 1, 2, and Future Funding efforts

Shape – Phase 1, 2, and Future Funding efforts

MapUnit – Phase 1, 2, and Future Funding efforts

ConiferCover – Phase 1, 2, and Future Funding efforts

HardwoodCover – Phase 1, 2, and Future Funding efforts

TotalTreeCover – Phase 1, 2, and Future Funding efforts

ShrubCover – Phase 1, 2, and Future Funding efforts

HerbaceousCover – Phase 1, 2, and Future Funding efforts

Exotics – Phase 1, 2, and Future Funding efforts

Roadedness – Phase 1, 2, and Future Funding efforts

Development – Phase 1, 2, and Future Funding efforts

AnthropogenicAlteration – Phase 1, 2, and Future Funding efforts

Notes – Phase 1, 2, and Future Funding efforts

LandUse – Phase 1, 2, and Future Funding efforts

MethodID – Attributized as part of Future Funding efforts

TreeHeight – Attributized as part of Future Funding efforts

CWJRTreeSize – Attributized as part of Future Funding efforts

Shape\_Length – Phase 1, 2, and Future Funding efforts

Shape\_Area – Phase 1, 2, and Future Funding efforts

Database Status – Phase 1 and 2 interim delivery only



## Appendix B: Preliminary Mapping Classification Hierarchy – 9-30-2023 (AIS)

### Map Unit (Vegetation Type)

MMU = 1 acre upland; ½ acre special: wetlands and riparian;  
Exotic

**Class**

**Subclass**

Formation

Division

*Macrogroup*

*Group*

    Alliance

        Association

### **Forest & Woodland Class (1.) (1000)**

#### **Temperate & Boreal Forest & Woodland Subclass (1.B)**

Warm Temperate Forest & Woodland Formation (1.B.1.)

Californian Forest & Woodland Division (1.B.1.Nc.)

*Californian Forest & Woodland Macrogroup (M009) (1100)*

*Californian Broadleaf Forest & Woodland Group (G195) (1110)*

    Juglans californica Alliance (1111)

        Juglans californica – Quercus agrifolia Association

        Juglans californica / annual herbaceous Association

        Juglans californica / Artemisia californica / Leymus condensatus  
        Association

        Juglans californica / Heteromeles arbutifolia Association

        Juglans californica / Malosma laurina Association

    Quercus agrifolia Alliance (1112)

        Quercus agrifolia Association

        Quercus agrifolia – Umbellularia californica Association

        Quercus agrifolia / Ceanothus (oliganthus, spinosus) Association

        Quercus agrifolia / Heteromeles arbutifolia Association

        Quercus agrifolia / Salvia leucophylla – Artemisia californica Association

    Quercus lobata Alliance (1113)

        Quercus lobata – Quercus agrifolia / grass Association

    Umbellularia californica Alliance (1114)

        Umbellularia californica / Ceanothus oliganthus Association

*Californian Ruderal Forest Macrogroup (M513) (1200)*  
*Californian Ruderal Forest Group (G678) (1210) (Exotic)*  
Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia Semi-natural Alliance (1211) (Exotic)  
Eucalyptus (globulus, camaldulensis) Provisional Semi-natural Association\*  
Schinus (molle, terebinthifolius) – Myoporum laetum Semi-natural Alliance (1212) (Exotic)  
Schinus molle Association

Cool Temperate Forest & Woodland Formation (1.B.1.)  
Vancouverian Forest & Woodland Division (1.B.1.Nd.)  
*Southern Vancouverian Montane-Foothill Forest Macrogroup (M023) (1300)*  
*Californian Montane Conifer Forest & Woodland Group (G344) (1310)*  
Pseudotsuga macrocarpa Alliance (1311)  
Pseudotsuga macrocarpa – Quercus agrifolia Association

Temperate Flooded & Swamp Forest Formation (1.B.3.)  
Western North American Interior Flooded Forest Division (1.B.3.Nd.)  
*Interior Warm & Cool Desert Riparian Forest Macrogroup (M036) (1400)*  
*Western Interior Riparian Forest & Woodland Group (G797) (1410)*  
Platanus racemosa – Quercus agrifolia Alliance (1411) Riparian  
Platanus racemosa – Quercus agrifolia Association  
Platanus racemosa / Toxicodendron diversilobum Association  
Quercus agrifolia / Salix lasiolepis Association  
Salix gooddingii – Salix laevigata Alliance (1412) Riparian  
Salix laevigata Association  
Salix laevigata / Salix lasiolepis Association  
Populus fremontii – Fraxinus velutina – Salix gooddingii Alliance (1413) Riparian  
Populus fremontii – Salix laevigata Association

*Interior West Ruderal Riparian Forest & Scrub Macrogroup (M298) (1500)*  
*Interior West Ruderal Riparian Forest & Scrub Group (G510) (1510)*  
Tamarix spp. Semi-natural Alliance (1511) Riparian (Exotic)  
Tamarix spp. Association  
Nicotiana glauca Semi-natural Stands (1512) Riparian

Vancouverian Flooded & Swamp Forest Division (1.B.3.Ng.)  
*Vancouverian Flooded & Swamp Forest Macrogroup (M035) (1600)*  
*North Pacific Lowland Riparian Forest & Woodland Group (G254) (1610)*  
Populus trichocarpa Alliance (1611) Riparian

## **Shrub & Herb Vegetation Class (2.) (2000)**

### **Temperate & Boreal Grassland & Shrubland Subclass (2.B.)**

#### Mediterranean Scrub & Grassland Formation (2.B.1.)

##### **Californian Scrub & Grassland Division (2.B.1.Na.) (2005)**

##### *Californian Annual & Perennial Grassland Macrogroup (M045) (2100)*

##### *Californian Perennial Grassland Group (G496) (2110)*

Corethrogyne filaginifolia – Eriogonum (elongatum, nudum) Alliance (2111)

Calystegia macrostegia – Eucrypta chrysanthemifolia Association

Corethrogyne filaginifolia Association

Leymus condensatus Alliance (2112)

Leymus condensatus Association

##### *Californian Annual Grassland & Forb Meadow Group (G766) (2120)*

Eschscholzia (californica) – Lupinus (nanus) Alliance (2121)

Lasthenia californica – Plantago erecta – Vulpia microstachys Alliance (2122)

Amsinckia (menziesii, tessellata) – Phacelia spp. Alliance (2123)

##### *Californian Chaparral Macrogroup (M043) (2200)*

##### *Californian Maritime Chaparral Group (G258) (2210)*

Malosma laurina Alliance (2211)

Malosma laurina Association

Malosma laurina – Artemisia californica – Eriogonum fasciculatum Association

Malosma laurina – Artemisia californica – Salvia leucophylla Association

Malosma laurina – Rhus ovata Association

Malosma laurina – Salvia mellifera Association

Rhus integrifolia Alliance (2212)

Rhus integrifolia Association

Rhus integrifolia – Artemisia californica – Eriogonum cinereum Association

Rhus integrifolia – Artemisia californica – Salvia mellifera Association

Rhus integrifolia – Heteromeles arbutifolia Association

Rhus integrifolia – Malosma laurina Association

##### *Californian Mesic & Pre-montane Chaparral Group (G261) (2220)*

Arctostaphylos glandulosa Alliance (2221)

Arctostaphylos glandulosa – Adenostoma fasciculatum Association

Ceanothus oliganthus – Ceanothus leucodermis – Ceanothus tomentosus Alliance (2222)

Ceanothus oliganthus Association

Ceanothus oliganthus – Adenostoma fasciculatum Association

Cercocarpus montanus Alliance (2223)

Cercocarpus montanus – Adenostoma fasciculatum Association

Cercocarpus montanus var. glaber Association

Prunus ilicifolia – Heteromeles arbutifolia – Ceanothus spinosus Alliance (2224)

Heteromeles arbutifolia Provisional Association

Heteromeles arbutifolia – Artemisia californica Association

Heteromeles arbutifolia – Fraxinus dipetala Provisional Association

- Prunus ilicifolia ssp. ilicifolia Association
- Prunus ilicifolia ssp. ilicifolia – Heteromeles arbutifolia Association
- Quercus berberidifolia Alliance (2225)
- Quercus berberidifolia Association
- Quercus berberidifolia – Adenostoma fasciculatum Association
- Californian Xeric Chaparral Group (G257) (2230)*
- Adenostoma fasciculatum Alliance (2231)
- Adenostoma fasciculatum Association
- Adenostoma fasciculatum – (Eriogonum fasciculatum – Salvia mellifera) Association
- Adenostoma fasciculatum – (Lotus scoparius – Eriodictyon spp.) Association
- Adenostoma fasciculatum – Diplacus aurantiacus Association
- Adenostoma fasciculatum – Eriogonum fasciculatum Association
- Adenostoma fasciculatum – Malosma laurina Association
- Adenostoma fasciculatum – Salvia spp. Alliance (2232)
- Adenostoma fasciculatum – Salvia mellifera Association
- Ceanothus crassifolius Alliance (2233)
- Ceanothus crassifolius Association
- Ceanothus crassifolius – Adenostoma fasciculatum Association
- Ceanothus crassifolius – Cercocarpus montanus Association
- Ceanothus megacarpus Alliance (2234)
- Ceanothus megacarpus Association
- Ceanothus megacarpus – Salvia mellifera Association
- Californian Coastal Scrub Macrogroup (M044) (2300)*
- Californian Coastal-Foothill Seral Scrub Group (G782) (2310)*
- Diplacus aurantiacus Alliance (2311)
- Ericameria linearifolia – Cleome isomeris Alliance (2312)
- Ericameria linearifolia Association
- Hazardia squarrosa – Ericameria palmeri Alliance (2313)
- Ericameria palmeri Provisional Association
- Lotus scoparius – Lupinus albifrons – Eriodictyon spp. Alliance (2314)
- Dendromecon rigida Association
- Eriodictyon crassifolium Provisional Association
- Lotus scoparius Association
- Malacothamnus fasciculatus – Malacothamnus spp. Alliance (2315)
- Malacothamnus fasciculatus Association
- Malacothamnus fasciculatus – Salvia leucophylla Association
- Californian North Coastal & Mesic Scrub Group (G662) (2320)*
- Baccharis pilularis Alliance (2321)
- Baccharis pilularis – Artemisia californica Association
- Toxicodendron diversilobum Alliance (2322)
- Toxicodendron diversilobum – Artemisia californica / Leymus condensatus Association

*Central & Southern Californian Coastal Sage Scrub Group (G264) (2330)*

*Artemisia californica – Salvia leucophylla Alliance (2331)*

Artemisia californica Association

Artemisia californica – (Salvia leucophylla) / Leymus condensatus Association

Artemisia californica – Eriogonum cinereum Association

Artemisia californica – Eriogonum fasciculatum Association

Artemisia californica – Eriogonum fasciculatum – Opuntia littoralis / Dudleya (edulis) Association

Artemisia californica – Eriogonum fasciculatum – Salvia leucophylla Association

Artemisia californica – Eriogonum fasciculatum – Salvia mellifera Association

Artemisia californica – Salvia leucophylla Association

Artemisia californica – Salvia leucophylla – Eriogonum cinereum / Nassella spp. Association

Artemisia californica / Nassella (pulchra) Association

Salvia leucophylla Association

*Encelia californica – Eriogonum cinereum Alliance (2332)*

Encelia californica Association

Encelia californica – Artemisia californica Association

Encelia californica – Eriogonum cinereum Association

Encelia californica – Malosma laurina – Salvia mellifera Association

Eriogonum cinereum Association

*Eriogonum fasciculatum – Salvia apiana Alliance (2333)*

Eriogonum fasciculatum Association

Eriogonum fasciculatum – Salvia apiana Association

Eriogonum fasciculatum – Salvia mellifera – Malosma laurina Association

Eriogonum fasciculatum var. foliolosum – Hesperoyucca whipplei Association

Salvia apiana Provisional Association

Salvia apiana – Artemisia californica – Ericameria spp. Association

*Salvia mellifera – Artemisia californica Alliance (2334)*

Salvia mellifera Association

Salvia mellifera – Artemisia californica – Malosma laurina Association

Salvia mellifera – Eriogonum cinereum Association

Salvia mellifera – Eriogonum fasciculatum Association

Salvia mellifera – Lotus scoparius Association

Salvia mellifera – Malacothamnus fasciculatus Association

Salvia mellifera – Rhus ovata Association

*Californian Ruderal Grassland, Meadow & Scrub Macrogroup (M046) (2400)*

*Californian Ruderal Grassland, Meadow & Scrub Group (G497) (2410) (Exotic)*

*Avena spp. – Bromus spp. Semi-natural Alliance (2411) (Exotic)*

Avena barbata – Avena fatua Semi-natural Association

Bromus diandrus – Avena spp. Semi-natural Association

Bromus diandrus Semi-natural Association  
 Bromus hordeaceus – Erodium botrys Semi-natural Association  
 Brachypodium distachyon Semi-natural Association  
 Brassica nigra – Centaurea (solstitialis, melitensis) Semi-natural Alliance (2412) (Exotic)  
 Brassica nigra Semi-natural Association  
 Centaurea melitensis Semi-natural Association  
 Hirschfeldia incana Semi-natural Association  
 Conium maculatum – Foeniculum vulgare Semi-natural Alliance (2413) (Exotic)  
 Foeniculum vulgare Semi-natural Association  
 Lolium perenne Semi-natural Alliance (2414) (Exotic)  
 Lolium perenne Semi-natural Association

#### Temperate Grassland & Shrubland Formation (2.B.2.)

Western North American Interior Chaparral Division (2.B.2.Nd.)

*Warm Interior Chaparral Macrogroup (M091) (2500)*

*Western Madrean Chaparral Group (G281) (2510)*

Rhus ovata Alliance (2511)

Rhus ovata Association

Rhus ovata – Salvia leucophylla – Artemisia californica Association

Western North American Grassland & Shrubland Division (2.B.2.Na.)

*Southern Vancouverian Lowland Grassland & Shrubland Macrogroup (M050) (2600)*

*Southern Vancouverian Shrub & Herbaceous Bald, Bluff & Prairie Group (G488) (2610)*

Bromus carinatus – Elymus glaucus Alliance (2611)

Pteridium aquilinum – Grass Association

#### Temperate to Polar Scrub & Herb Coastal Vegetation Formation (2.B.4.)

Pacific North American Coastal Scrub & Herb Vegetation Division (2.B.4.Nb.)

*Pacific Coastal Beach & Dune Macrogroup (M059) (2700)*

*Californian Coastal Beach & Dune Group (G663) (2710)*

Isocoma menziesii Alliance (2711)

Isocoma menziesii Association

Isocoma menziesii – Artemisia californica Association

#### **Shrub & Herb Wetland Subclass (2.C.) (3000)**

Temperate to Polar Freshwater Marsh, Wet Meadow & Shrubland Formation (2.C.4.)

Western North American Temperate & Boreal Freshwater Marsh, Wet Meadow & Shrubland Division (2.C.4.Nb.)

*Vancouverian Lowland Marsh, Wet Meadow & Shrubland Macrogroup (M073) (3100)*

*Temperate Pacific Freshwater Wet Mudflat Group (G525) (3110)*

Heterotheca (oregona, sessiliflora) Alliance (3111) **Wetland**

Heterotheca sessiliflora Provisional Association

Grindelia (camporum, stricta) Alliance (3112) **Wetland**

Ambrosia psilostachya – Grindelia hirsutula var. hallii Association



*Arid West Interior Freshwater Marsh Macrogroup (M888) (3200)*  
*Arid West Interior Freshwater Marsh Group (G531) (3210)*  
     *Schoenoplectus acutus* – *Schoenoplectus californicus* Alliance (3211) **Wetland**  
     *Typha* (*angustifolia*, *domingensis*, *latifolia*) Alliance (3212) **Wetland**

*Western North American Ruderal Marsh, Wet Meadow & Shrubland Macrogroup (M301) (3300)*  
*Western North American Ruderal Marsh, Wet Meadow & Shrubland Group (G524) (3310) (Exotic)*  
     *Phragmites australis* ssp. *australis* – *Arundo donax* Semi-natural Alliance (3311) **Wetland** (Exotic)  
     *Phalaris aquatica* – *Phalaris arundinacea* Semi-natural Alliance (3312) **Wetland** (Exotic)  
         *Phalaris aquatica* Semi-natural Association

*Western North American Vernal Pool Macrogroup (M074) (3400)*  
*Californian Vernal Pool Group (G530) (3410) Wetland*

Southwestern North American Warm Desert Freshwater Marsh & Bosque Division (2.C.4.Nc.)  
*Warm Desert Lowland Freshwater Marsh, Wet Meadow & Shrubland Macrogroup (M076) (3500)*  
*North American Warm Desert Riparian Low Bosque & Shrubland Group (G533) (3510)*  
     *Baccharis salicifolia* Alliance (3511) **Riparian**  
         *Baccharis salicifolia* Association  
     *Salix exigua* Alliance (3512) **Riparian**  
         *Salix exigua* – *Arundo donax* Association  
         *Salix exigua* Association  
     *Salix lasiolepis* Alliance (3513) **Riparian**  
         *Salix lasiolepis* Association  
         *Salix lasiolepis* – *Baccharis salicifolia* Association  
     *Sambucus nigra* Alliance (3514) **Riparian**  
         *Sambucus nigra* Association

Salt Marsh Formation (2.C.5.)  
 North American Western Interior Brackish Marsh, Playa. & Shrubland Division (2.C.5.Nd.)  
*Warm & Cool Desert Alkali-Saline Marsh, Playa & Shrubland Macrogroup (M082) (3600)*  
*North American Desert Alkaline-Saline Marsh & Playa Group (G538) (3610)*  
     *Distichlis spicata* Alliance (3611) **Wetland**  
         *Distichlis spicata* – annual grasses Association  
         *Distichlis spicata* Association  
     *Leymus cinereus* – *Leymus triticoides* Alliance (3612) **Wetland**

*North American Desert Alkaline-Saline Wet Scrub Group (G537) (3620)*

Pluchea sericea Alliance (3621) **Riparian**

Pluchea sericea Association

Atriplex lentiformis Alliance (3622) **Riparian**

Atriplex lentiformis Association

### **Desert & Semi-Desert Class (3.) (4000)**

#### **Warm Desert & Semi-Desert Woodland, Scrub & Grassland Subclass (3.A.)**

Warm Desert & Semi-Desert Scrub & Grassland Formation (3.A.2.)

*North American Warm Desert Scrub & Grassland Division (3.A.2.Na.)*

*Mojave-Sonoran Semi-Desert Scrub (M088) Macrogroup (4100)*

*Baja Semi-Desert Coastal Succulent Scrub Group (G298) (4110)*

Opuntia littoralis – Opuntia oricola – Cylindropuntia prolifera Alliance (4111)

Cylindropuntia prolifera – Mixed Coastal Scrub Provisional Association

Opuntia littoralis Association

Opuntia oricola Provisional Association

*North American Warm Desert Ruderal Scrub & Grassland Macrogroup (M512) (4200)*

*North American Warm Desert Ruderal Grassland Group (G677) (4210)*

Pennisetum setaceum – Pennisetum ciliare Semi-natural Alliance (4211) **(Exotic)**

Pennisetum setaceum Semi-natural Association

*North American Warm-Desert Xeric-Riparian Scrub Macrogroup (M092) (4300)*

*Warm Semi-Desert Shrub & Herb Dry Wash & Colluvial Slope Group (G541) (4310)*

Lepidospartum squamatum Alliance (4311) **Riparian**

Lepidospartum squamatum – Baccharis salicifolia Association

Lepidospartum squamatum – Eriogonum fasciculatum Association

Lepidospartum squamatum / ephemeral annuals Association

#### **Cool Semi-Desert Scrub & Grassland Subclass (3.B.) (5000)**

Cool Semi-Desert Scrub & Grassland Formation (3.B.1)

*Western North American Cool Semi-Desert Scrub & Grassland Division (3.B.1.Ne.)*

*Great Basin-Intermountain Tall Sagebrush Steppe & Shrubland Macrogroup (M169) (5100)*

*Intermountain Mesic Tall Sagebrush Steppe & Shrubland Group (G302)*

*Intermountain Dry Tall Sagebrush Steppe & Shrubland Group (G303) (5110)*

Artemisia tridentata Alliance (5111)

## **Open Rock Vegetation Class (6.) (6000)**

### **Temperate & Boreal Open Rock Vegetation Subclass (6.B.)**

#### Temperate & Boreal Cliff, Scree & Other Rock Vegetation Formation (6.B.1.)

Western North American Temperate & Boreal Cliff, Scree & Rock Vegetation Division  
(6.B.1.Nb.)

*Western North American Cliff, Scree & Rock Vegetation Macrogroup (M887) (6100)*

*Californian Cliff, Scree & Rock Vegetation Group (G563) (6110)*

Selaginella bigelovii Alliance (6111)

Selaginella bigelovii / Eriogonum fasciculatum Association

Dudleya cymosa – Dudley lanceolata – Lichen/Moss Sparse Alliance (6112)

Lichen Gravel – Bedrock Nonvascular Sparse Association

Sparsely Vegetated/Barren (6113)

### **Miscellaneous Classes (9000)**

Sparsely Vegetated to Non-vegetated (9100)

Cleared Land (9110)

Sand/Gravel Bar (9120) **Riparian**

Rocky Streambed (9130) **Riparian**

Landslide (9140)

Firebreak (9150)

Agriculture (9200)

Urban (9300)

Urban Window (9310)

Exotic or Planted Trees and Shrubs (9400) **(Exotic)**

Artificial Cuts/Embankments (9500)

Exotic (9510) **(Exotic)**

Trees (9520)

Shrubs (9530)

Coastal Sage Scrub (9531)

Herbaceous to Sparsely Vegetated (9540)

Post-Fire (9700)

Water (9800) **Wetland**

Small Earthen Dammed Ponds (9801) **Wetland**

### **Other Attributes**

#### **Percent Cover - Woody (Conifer, Hardwood, Total Tree, Shrub)**

Absolute Cover 1% increment

nnn = Absolute Cover

000 = None or None Observable

999 = Not Applicable, Not Assessed

photo interpreted based on the following ranges:

0-2%

>2-10%

>10-25%

>25-40%

>40-60%

>60%

#### **Percent Cover – Herbaceous**

1 = 0-2%

2 = >2-10%

3 = >10-40%

4 = >40%

9 = Not Applicable, Not Assessed

#### **Roadedness Disturbance**

0 = No observed roads or trails.

1 = Minimal Roadedness: Less than one-third of the polygon is crossed by roads or trails. Polygons adjacent to paved roads are also placed into this category.

2 = Moderate Roadedness: Between one-third and two-thirds of the polygon is crossed by roads or trails.

3 = High Roadedness: Over two-thirds of the polygon is crossed by roads or trails.

9 = Not Applicable/Not Assigned

#### **Anthropogenically Altered Disturbance (Clearing)**

0 = No observed clearing

1 = Minimal Anthropogenic Clearing: Less than one-third of the polygon has been cleared of at least the understory vegetation.

2 = Moderate Anthropogenic Clearing: Between one-third and two-thirds of the polygon has been cleared of at least the understory vegetation.

3 = High Anthropogenic Clearing: Over two-thirds of the polygon has been cleared of at least the understory vegetation.

9 = Not Applicable/Not Assigned

### Exotics (Invasives)

0 = Little or No Observable Invasive Plant Cover: Less than 5%

1 = Low Invasive Plant Cover: Less than 33% of the polygon but over 5% is covered with invasive plants.

2 = Moderate Invasive Plant Cover: Between 33% and 66% of the polygon is covered with invasive plants.

3 = High Invasive Plant Cover: Over 66% of the polygon's area is covered with invasive plants.

9 = Not Applicable/Not Assigned

### Land Use

0000 = Not Assessed

1000 = Urban

1436 = Water Transfer

1850 = Wildlife Preserves and Sanctuaries

2000 = Agriculture (includes nurseries)

2100 = Non-woody row and field crops

2200 = Orchards & Vineyards

2300 = Improved Pastureland (irrigated)

3500 = Vacant Land – Restoration

9800 = Undifferentiated Water

9810 = Water Impoundment Feature

### Tree Height

01 = <.5m

02 = >.5-1m

03 = >1-2m

04 = >2-5m

05 = >5-10m

06 = >10-15m

07 = >15-20m

08 = >20-35m

09 = >35-50m

10 = >50m

99 = Not Applicable/Not Assessed

### California Wildlife Habitat Relations (CWHR) Tree Size Class

1 = Seedlings (<1" dbh)

2 = Saplings (>1"-6" dbh)

3 = Pole (>6"-11" dbh)

4 = Small (>11"-24" dbh)

5 = Medium-large (>24" dbh)

6 = Multi-layered medium-large trees over smaller trees in densities >60%

9 = Not Applicable/Not Assessed

#### Method ID

- 01 = Rapid Assessment (current project)
- 02 = Releve
- 03 = Field Verification
- 04 = Photointerpretation
- 05 = Adjacent stand information or photo
- 06 = Reconnaissance (current project)
- 07 = Other information
- 08 = Older plot data
- 09 = Older recon data
- 10 = Accuracy Assessment
- 60 = Inconsequential Project Information

#### Note

A Comment Field in the database used to add any pertinent additional information, such as significant additional species present not accounted for in the alliance or association name.



## Appendix C: Preliminary Mapping Classification Alpha Code Sheet – 9-30-2023

### Map Unit (Vegetation Type)

MMU = 1 acre upland; ½ acre special: wetlands and riparian;  
Exotic

### TREES

Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia Semi-natural Alliance  
(1211) (Exotic)

Eucalyptus (globulus, camaldulensis) Provisional Semi-natural Association

Juglans californica Alliance (1111)

Juglans californica – Quercus agrifolia Association

Juglans californica / annual herbaceous Association

Juglans californica / Artemisia californica / Leymus condensatus Association

Juglans californica / Heteromeles arbutifolia Association

Juglans californica / Malosma laurina Association

Platanus racemosa – Quercus agrifolia Alliance (1411) Riparian

Platanus racemosa – Quercus agrifolia Association

Platanus racemosa / Toxicodendron diversilobum Association

Quercus agrifolia / Salix lasiolepis Association

Populus fremontii – Fraxinus velutina – Salix gooddingii Alliance (1413) Riparian

Populus fremontii – Salix laevigata Association

Populus trichocarpa Alliance (1611) Riparian

Pseudotsuga macrocarpa Alliance (1311)

Pseudotsuga macrocarpa – Quercus agrifolia Association

Quercus agrifolia Alliance (1112)

Quercus agrifolia Association

Quercus agrifolia – Umbellularia californica Association

Quercus agrifolia / Ceanothus (oliganthus, spinosus) Association

Quercus agrifolia / Heteromeles arbutifolia Association

Quercus agrifolia / Salvia leucophylla – Artemisia californica Association

Quercus lobata Alliance (1113)

Quercus lobata – Quercus agrifolia / grass Association

Salix gooddingii – Salix laevigata Alliance (1412) Riparian

Salix laevigata Association

Salix laevigata / Salix lasiolepis Association

Schinus (molle, terebinthifolius) – Myoporum laetum Semi-natural Alliance (1212)  
(Exotic)

Schinus molle Association

Umbellularia californica Alliance (1114)

Umbellularia californica / Ceanothus oliganthus Association

## **SHRUBS**

### **Adenostoma fasciculatum Alliance (2231)**

Adenostoma fasciculatum Association

Adenostoma fasciculatum – (Eriogonum fasciculatum – Salvia mellifera) Association

Adenostoma fasciculatum – (Lotus scoparius – Eriodictyon spp.) Association

Adenostoma fasciculatum – Diplacus aurantiacus Association

Adenostoma fasciculatum – Eriogonum fasciculatum Association

Adenostoma fasciculatum – Malosma laurina Association

### **Adenostoma fasciculatum – Salvia spp. Alliance (2232)**

Adenostoma fasciculatum – Salvia mellifera Association

### **Arctostaphylos glandulosa Alliance (2221)**

Arctostaphylos glandulosa – Adenostoma fasciculatum Association

### **Artemisia californica – Salvia leucophylla Alliance (2331)**

Artemisia californica Association

Artemisia californica – (Salvia leucophylla) / Leymus condensatus Association

Artemisia californica – Eriogonum cinereum Association

Artemisia californica – Eriogonum fasciculatum Association

Artemisia californica – Eriogonum fasciculatum – Opuntia littoralis / Dudleya (edulis) Association

Artemisia californica – Eriogonum fasciculatum – Salvia leucophylla Association

Artemisia californica – Eriogonum fasciculatum – Salvia mellifera Association

Artemisia californica – Salvia leucophylla Association

Artemisia californica – Salvia leucophylla – Eriogonum cinereum / Nassella spp. Assoc.

Artemisia californica / Nassella (pulchra) Association

Salvia leucophylla Association

### **Artemisia tridentata Alliance (5111)**

### **Atriplex lentiformis Alliance (3622) Riparian**

Atriplex lentiformis Association

### **Baccharis pilularis Alliance (2321)**

Baccharis pilularis – Artemisia californica Association

### **Baccharis salicifolia Alliance (3511) Riparian**

Baccharis salicifolia Association

### **Ceanothus crassifolius Alliance**

Ceanothus crassifolius Association

Ceanothus crassifolius – Adenostoma fasciculatum Association

Ceanothus crassifolius – Cercocarpus montanus Association

Ceanothus megacarpus Association

Ceanothus megacarpus – Salvia mellifera Association

### **Ceanothus oliganthus – Ceanothus leucodermis – Ceanothus tomentosus Alliance (2222)**

Ceanothus oliganthus Association

Ceanothus oliganthus – Adenostoma fasciculatum Association

*Cercocarpus montanus* Alliance (2223)  
     *Cercocarpus montanus* – *Adenostoma fasciculatum* Association  
     *Cercocarpus montanus* var. *glaber* Association  
*Diplacus aurantiacus* Alliance (2311)  
*Encelia californica* – *Eriogonum cinereum* Alliance (2332)  
     *Encelia californica* Association  
     *Encelia californica* – *Artemisia californica* Association  
     *Encelia californica* – *Eriogonum cinereum* Association  
     *Encelia californica* – *Malosma laurina* – *Salvia mellifera* Association  
     *Eriogonum cinereum* Association  
*Ericameria linearifolia* – *Cleome isomeris* Alliance (2312)  
     *Ericameria linearifolia* Association  
*Eriogonum fasciculatum* – *Salvia apiana* Alliance (2333)  
     *Eriogonum fasciculatum* Association  
     *Eriogonum fasciculatum* – *Salvia apiana* Association  
     *Eriogonum fasciculatum* – *Salvia mellifera* – *Malosma laurina* Association  
     *Eriogonum fasciculatum* var. *foliolosum* – *Hesperoyucca whipplei* Association  
     *Salvia apiana* Provisional Association  
     *Salvia apiana* – *Artemisia californica* – *Ericameria* spp. Association  
*Hazardia squarrosa* – *Ericameria palmeri* Alliance (2313)  
     *Ericameria palmeri* Provisional Association  
*Isocoma menziesii* Alliance (2711)  
     *Isocoma menziesii* Association  
     *Isocoma menziesii* – *Artemisia californica* Association  
*Lepidospartum squamatum* Alliance (4311) **Riparian**  
     *Lepidospartum squamatum* – *Baccharis salicifolia* Association  
     *Lepidospartum squamatum* – *Eriogonum fasciculatum* Association  
     *Lepidospartum squamatum* / ephemeral annuals Association  
*Lotus scoparius* – *Lupinus albifrons* – *Eriodictyon* spp. Alliance (2314)  
     *Dendromecon rigida* Association  
     *Eriodictyon crassifolium* Provisional Association  
     *Lotus scoparius* Association  
*Malacothamnus fasciculatus* – *Malacothamnus* spp. Alliance (2315)  
     *Malacothamnus fasciculatus* Association  
     *Malacothamnus fasciculatus* – *Salvia leucophylla* Association  
*Malosma laurina* Alliance (2211)  
     *Malosma laurina* Association  
     *Malosma laurina* – *Artemisia californica* – *Eriogonum fasciculatum* Association  
     *Malosma laurina* – *Artemisia californica* – *Salvia leucophylla* Association  
     *Malosma laurina* – *Rhus ovata* Association  
     *Malosma laurina* – *Salvia mellifera* Association  
*Nicotiana glauca* Semi-natural Stands (1512) **Riparian**  
*Opuntia littoralis* – *Opuntia oricola* – *Cylindropuntia prolifera* Alliance (4111)  
     *Cylindropuntia prolifera* – Mixed Coastal Scrub Provisional Association  
     *Opuntia littoralis* Association  
     *Opuntia oricola* Provisional Association

Pluchea sericea Alliance (3621) **Riparian**  
     Pluchea sericea Association  
 Prunus ilicifolia – Heteromeles arbutifolia – Ceanothus spinosus Alliance (2224)  
     Heteromeles arbutifolia Provisional Association  
     Heteromeles arbutifolia – Artemisia californica Association  
     Heteromeles arbutifolia – Fraxinus dipetala Provisional Association  
     Prunus ilicifolia ssp. ilicifolia Association  
     Prunus ilicifolia ssp. ilicifolia – Heteromeles arbutifolia Association  
 Quercus berberidifolia Alliance (2225)  
     Quercus berberidifolia Association  
     Quercus berberidifolia – Adenostoma fasciculatum Association  
 Rhus integrifolia Alliance (2212)  
     Rhus integrifolia Association  
     Rhus integrifolia – Artemisia californica – Eriogonum cinereum Association  
     Rhus integrifolia – Artemisia californica – Salvia mellifera Association  
     Rhus integrifolia – Heteromeles arbutifolia Association  
     Rhus integrifolia – Malosma laurina Association  
 Rhus ovata Alliance (2511)  
     Rhus ovata Association  
     Rhus ovata – Salvia leucophylla – Artemisia californica Association  
 Salix exigua Alliance (3512) **Riparian**  
     Salix exigua – Arundo donax Association  
     Salix exigua Association  
 Salix lasiolepis Alliance (3513) **Riparian**  
     Salix lasiolepis Association  
     Salix lasiolepis – Baccharis salicifolia Association  
 Salvia mellifera – Artemisia californica Alliance (2334)  
     Salvia mellifera Association  
     Salvia mellifera – Artemisia californica – Malosma laurina Association  
     Salvia mellifera – Eriogonum cinereum Association  
     Salvia mellifera – Eriogonum fasciculatum Association  
     Salvia mellifera – Lotus scoparius Association  
     Salvia mellifera – Malacothamnus fasciculatus Association  
     Salvia mellifera – Rhus ovata Association  
 Sambucus nigra Alliance (3514) **Riparian**  
     Sambucus nigra Association  
 Tamarix spp. Semi-natural Alliance (1511) **Riparian** (Exotic)  
     Tamarix spp. Association  
 Toxicodendron diversilobum Alliance (2322)  
     Toxicodendron diversilobum – Artemisia californica / Leymus condensatus Association

## **HERBS**

### ***Californian Scrub & Grassland Division (2005)***

#### ***Californian Annual & Perennial Grassland Macrogroup (Native) (M045) (2100)***

#### ***Californian Ruderal Grassland, Meadow & Scrub Group (Non-native) (G497) (2410)* **(Exotic)****

*Arid West Interior Freshwater Marsh Group (G531) (3210) Wetland*

*Californian Vernal Pool Group (G530) (3410) Wetland*

*Californian Cliff, Scree & Rock Vegetation Group (G563) (6110)*

*Amsinckia (menziesii, tessellata) – Phacelia spp. Alliance (2123)*

*Avena spp. – Bromus spp. Semi-natural Alliance (2411) (Exotic)*

*Avena barbata – Avena fatua Semi-natural Association*

*Bromus diandrus – Avena spp. Semi-natural Association*

*Bromus diandrus Semi-natural Association*

*Bromus hordeaceus – Erodium botrys Semi-natural Association*

*Brachypodium distachyon Semi-natural Association*

*Brassica nigra – Centaurea (solstitialis, melitensis) Semi-natural Alliance (2412) (Exotic)*

*Brassica nigra Semi-natural Association*

*Centaurea melitensis Semi-natural Association*

*Hirschfeldia incana Semi-natural Association*

*Bromus carinatus – Elymus glaucus Alliance (2611)*

*Pteridium aquilinum – Grass Association*

*Conium maculatum – Foeniculum vulgare Semi-natural Alliance (2413) (Exotic)*

*Foeniculum vulgare Semi-natural Association*

*Corethrogyne filaginifolia – Eriogonum (elongatum, nudum) Alliance † (2111)*

*Calystegia macrostegia – Eucrypta chrysanthemifolia Association*

*Corethrogyne filaginifolia Association*

*Distichlis spicata Alliance (3611) Wetland*

*Distichlis spicata – annual grasses Association*

*Distichlis spicata Association*

*Dudleya cymosa – Dudleya lanceolata – Lichen/Moss Sparse Alliance (6112)*

*Lichen Gravel – Bedrock Nonvascular Sparse Association*

*Eschscholzia (californica) – Lupinus (nanus) Alliance (2121)*

*Grindelia (camporum, stricta) Alliance (3112)*

*Ambrosia psilostachya – Grindelia hirsutula var. hallii Association*

*Heterotheca (oregona, sessiliflora) Alliance (3111)*

*Heterotheca sessiliflora Provisional Association*

*Lasthenia californica – Plantago erecta – Vulpia microstachys Alliance (2122)*

*Leymus condensatus Alliance (2112)*

*Leymus condensatus Association*

*Leymus cinereus – Leymus triticoides Alliance (3612) (Wetland)*

*Lolium perenne Semi-natural Alliance (2414) (Exotic)*

*Lolium perenne Semi-natural Association*

*Pennisetum setaceum – Pennisetum ciliare Semi-natural Alliance (4211) (Exotic)*

*Pennisetum setaceum Semi-natural Association*

*Phragmites australis* ssp. *australis* – *Arundo donax* Semi-natural Alliance (3311) (Exotic)

*Phalaris aquatica* – *Phalaris arundinacea* Semi-natural Alliance (3312) (Exotic)

*Phalaris aquatica* Semi-natural Association

*Schoenoplectus acutus* – *Schoenoplectus californicus* Alliance (3211) Wetland

### **Miscellaneous Classes (9000)**

Sparsely Vegetated to Non-vegetated (9100)

Cleared Land (9110)

Sand/Gravel Bar (9120) Riparian

Rocky Streambed (9130) Riparian

Landslide (9140)

Firebreak (9150)

Agriculture (9200)

Urban (9300)

Urban Window (9310)

Exotic or Planted Trees and Shrubs (9400) (Exotic)

Artificial Cuts/Embankments (9500)

Exotic (9510) (Exotic)

Trees (9520)

Shrubs (9530)

Coastal Sage Scrub (9531)

Herbaceous to Sparsely Vegetated (9540)

Post-Fire (9700)

Water (9800) Wetland

Small Earthen Dammed Ponds (9801) Wetland



### **Other Attributes**

#### **Percent Cover - Woody** (Conifer, Hardwood, Total Tree, Shrub)

Absolute Cover 1% increment

nnn = Absolute Cover

000 = None or None Observable

999 = Not Applicable, Not Assessed

photo interpreted based on the following ranges:

0-2%

>2-10%

>10-25%

>25-40%

>40-60%

>60%

#### **Percent Cover – Herbaceous**

1 = 0-2%

2 = >2-10%

3 = >10-40%

4 = >40%

9 = Not Applicable, Not Assessed

#### **Roadedness Disturbance**

0 = No observed roads or trails.

1 = Minimal Roadedness: Less than one-third of the polygon is crossed by roads or trails. Polygons adjacent to paved roads are also placed into this category.

2 = Moderate Roadedness: Between one-third and two-thirds of the polygon is crossed by roads or trails.

3 = High Roadedness: Over two-thirds of the polygon is crossed by roads or trails.

9 = Not Applicable/Not Assigned

#### **Anthropogenically Altered Disturbance (Clearing)**

0 = No observed clearing

1 = Minimal Anthropogenic Clearing: Less than one-third of the polygon has been cleared of at least the understory vegetation.

2 = Moderate Anthropogenic Clearing: Between one-third and two-thirds of the polygon has been cleared of at least the understory vegetation.

3 = High Anthropogenic Clearing: Over two-thirds of the polygon has been cleared of at least the understory vegetation.

9 = Not Applicable/Not Assigned

### Exotics (Invasives)

0 = Little or No Observable Invasive Plant Cover: Less than 5%

1 = Low Invasive Plant Cover: Less than 33% of the polygon but over 5% is covered with invasive plants.

2 = Moderate Invasive Plant Cover: Between 33% and 66% of the polygon is covered with invasive plants.

3 = High Invasive Plant Cover: Over 66% of the polygon's area is covered with invasive plants.

9 = Not Applicable/Not Assigned

### Land Use

0000 = Not Assessed

1000 = Urban

1436 = Water Transfer

1850 = Wildlife Preserves and Sanctuaries

2000 = Agriculture (includes nurseries)

2100 = Non-woody row and field crops

2200 = Orchards & Vineyards

2300 = Improved Pastureland (irrigated)

3500 = Vacant Land – Restoration

9800 = Undifferentiated Water

9810 = Water Impoundment Feature

### Tree Height

01 = <.5m

02 = >.5-1m

03 = >1-2m

04 = >2-5m

05 = >5-10m

06 = >10-15m

07 = >15-20m

08 = >20-35m

09 = >35-50m

10 = >50m

99 = Not Applicable/Not Assessed

### California Wildlife Habitat Relations (CWHR) Tree Size Class

1 = Seedlings (<1' dbh)

2 = Saplings (>1"-6" dbh)

3 = Pole (>6"-11" dbh)

4 = Small (>11"-24" dbh)

5 = Medium-large (>24" dbh)

6 = Multi-layered medium-large trees over smaller trees in densities >60%

9 = Not Applicable/Not Assessed

#### Method ID

01 = Rapid Assessment (current project)  
02 = Releve  
03 = Field Verification  
04 = Photointerpretation  
05 = Adjacent stand information or photo  
06 = Reconnaissance (current project)  
07 = Other information  
08 = Older plot data  
09 = Older recon data  
10 = Accuracy Assessment  
60 = Inconsequential Project Information

#### Note

A Comment Field in the database used to add any pertinent additional information, such as significant additional species present not accounted for in the alliance or association name.

## Appendix D: Preliminary Mapping Classification Numeric Code Sheet – 9-30-2023 (AIS)

### Map Unit (Vegetation Type)

MMU = 1 acre upland; ½ acre special: wetlands and riparian;  
Exotic

#### **1100 = Forest & Woodland Class (1.) (1000)**

1100 = *Californian Forest & Woodland Macrogroup (M009) (1100)*

1110 = *Californian Broadleaf Forest & Woodland Group (G195) (1110)*

1111 = *Juglans californica Alliance (1111)*

Juglans californica – Quercus agrifolia Association

Juglans californica / annual herbaceous Association

Juglans californica / Artemisia californica / Leymus condensatus  
Association

Juglans californica / Heteromeles arbutifolia Association

Juglans californica / Malosma laurina Association

1112 = *Quercus agrifolia Alliance (1112)*

Quercus agrifolia Association

Quercus agrifolia – Umbellularia californica Association

Quercus agrifolia / Ceanothus (oliganthus, spinosus) Association

Quercus agrifolia / Heteromeles arbutifolia Association

Quercus agrifolia / Salvia leucophylla – Artemisia californica Association

1113 = *Quercus lobata Alliance (1113)*

Quercus lobata – Quercus agrifolia / grass Association

1114 = *Umbellularia californica Alliance (1114)*

Umbellularia californica / Ceanothus oliganthus Association

1200 = *Californian Ruderal Forest Macrogroup (M513) (1200)*

1210 = *Californian Ruderal Forest Group (G678) (1210) (Exotic)*

1211 = *Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia Semi-natural Alliance (1211) (Exotic)*

Eucalyptus (globulus, camaldulensis) Provisional Semi-natural Association

1212 = *Schinus (molle, terebinthifolius) – Myoporum laetum Semi-natural Alliance (1212) (Exotic)*

Schinus molle Association

1300 = *Southern Vancouverian Montane-Foothill Forest Macrogroup (M023) (1300)*

1310 = *Californian Montane Conifer Forest & Woodland Group (G344) (1310)*

1311 = *Pseudotsuga macrocarpa Alliance (1311)*

Pseudotsuga macrocarpa – Quercus agrifolia Association

1400 = *Interior Warm & Cool Desert Riparian Forest Macrogroup (M036) (1400)*

1410 = *Western Interior Riparian Forest & Woodland Group (G797) (1410)*

1411 = *Platanus racemosa – Quercus agrifolia Alliance (1411) Riparian*

Platanus racemosa – Quercus agrifolia Association

Platanus racemosa / Toxicodendron diversilobum Association

Quercus agrifolia / Salix lasiolepis Association

- 1412 = *Salix gooddingii* – *Salix laevigata* Alliance (1412) **Riparian**  
     *Salix laevigata* Association  
     *Salix laevigata* / *Salix lasiolepis* Association
- 1413 = *Populus fremontii* – *Fraxinus velutina* – *Salix gooddingii* Alliance (1413) **Riparian**  
     *Populus fremontii* – *Salix laevigata* Association
- 1500 = *Interior West Ruderal Riparian Forest & Scrub Macrogroup* (M298) (1500)
- 1510 = *Interior West Ruderal Riparian Forest & Scrub Group* (G510) (1510)
- 1511 = *Tamarix* spp. Semi-natural Alliance (1511) **Riparian** (Exotic)  
     *Tamarix* spp. Association
- 1512 = *Nicotiana glauca* Semi-natural Stands (1512) **Riparian**
- 1600 = *Vancouverian Flooded & Swamp Forest Macrogroup* (M035) (1600)
- 1610 = *North Pacific Lowland Riparian Forest & Woodland Group* (G254) (1610)
- 1611 = *Populus trichocarpa* Alliance (1611) **Riparian**
- 2000 = Shrub & Herb Vegetation Class (2.) (2000)**
- 2005 = Californian Scrub & Grassland Division (2005)**
- 2100 = *Californian Annual & Perennial Grassland Macrogroup* (M045) (2100)
- 2110 = *Californian Perennial Grassland Group* (G496) (2110)
- 2111 = *Corethrogyne filaginifolia* – *Eriogonum* (*elongatum*, *nudum*) Alliance † (2111)  
     *Calystegia macrostegia* – *Eucrypta chrysanthemifolia* Association  
     *Corethrogyne filaginifolia* Association
- 2112 = *Leymus condensatus* Alliance (2112)  
     *Leymus condensatus* Association
- 2120 = *Californian Annual Grassland & Forb Meadow Group* (G766) (2120)
- 2121 = *Eschscholzia* (*californica*) – *Lupinus* (*nanus*) Alliance (2121)
- 2122 = *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Alliance (2122)
- 2123 = *Amsinckia* (*menziesii*, *tessellata*) – *Phacelia* spp. Alliance (2123)
- 2200 = *Californian Chaparral Macrogroup* (M043) (2200)
- 2210 = *Californian Maritime Chaparral Group* (G258) (2210)
- 2211 = *Malosma laurina* Alliance (2211)  
     *Malosma laurina* Association  
     *Malosma laurina* – *Artemisia californica* – *Eriogonum fasciculatum* Association  
     *Malosma laurina* – *Artemisia californica* – *Salvia leucophylla* Association  
     *Malosma laurina* – *Rhus ovata* Association  
     *Malosma laurina* – *Salvia mellifera* Association
- 2212 = *Rhus integrifolia* Alliance (2212)  
     *Rhus integrifolia* Association  
     *Rhus integrifolia* – *Artemisia californica* – *Eriogonum cinereum* Association  
     *Rhus integrifolia* – *Artemisia californica* – *Salvia mellifera* Association  
     *Rhus integrifolia* – *Heteromeles arbutifolia* Association  
     *Rhus integrifolia* – *Malosma laurina* Association

- 2220 = *Californian Mesic & Pre-montane Chaparral Group (G261) (2220)*  
 2221 = *Arctostaphylos glandulosa Alliance (2221)*  
     *Arctostaphylos glandulosa – Adenostoma fasciculatum Association*  
 2222 = *Ceanothus oliganthus – Ceanothus leucodermis – Ceanothus tomentosus Alliance (2222)*  
     *Ceanothus oliganthus Association*  
     *Ceanothus oliganthus – Adenostoma fasciculatum Association*  
 2223 = *Cercocarpus montanus Alliance (2223)*  
     *Cercocarpus montanus – Adenostoma fasciculatum Association*  
     *Cercocarpus montanus var. glaber Association*  
 2224 = *Prunus ilicifolia – Heteromeles arbutifolia – Ceanothus spinosus Alliance (2224)*  
     *Heteromeles arbutifolia Provisional Association*  
     *Heteromeles arbutifolia – Artemisia californica Association*  
     *Heteromeles arbutifolia – Fraxinus dipetala Provisional Association*  
     *Prunus ilicifolia ssp. ilicifolia Association*  
     *Prunus ilicifolia ssp. ilicifolia – Heteromeles arbutifolia Association*  
 2225 = *Quercus berberidifolia Alliance (2225)*  
     *Quercus berberidifolia Association*  
     *Quercus berberidifolia – Adenostoma fasciculatum Association*  
 2230 = *Californian Xeric Chaparral Group (G257) (2230)*  
 2231 = *Adenostoma fasciculatum Alliance (2231)*  
     *Adenostoma fasciculatum Association*  
     *Adenostoma fasciculatum – (Eriogonum fasciculatum – Salvia mellifera) Association*  
     *Adenostoma fasciculatum – (Lotus scoparius – Eriodictyon spp.) Association*  
     *Adenostoma fasciculatum – Diplacus aurantiacus Association*  
     *Adenostoma fasciculatum – Eriogonum fasciculatum Association*  
     *Adenostoma fasciculatum – Malosma laurina Association*  
 2232 = *Adenostoma fasciculatum – Salvia spp. Alliance (2232)*  
     *Adenostoma fasciculatum – Salvia mellifera Association*  
 2233 = *Ceanothus crassifolius Alliance (2233)*  
     *Ceanothus crassifolius Association*  
     *Ceanothus crassifolius – Adenostoma fasciculatum Association*  
     *Ceanothus crassifolius – Cercocarpus montanus Association*  
 2234 = *Ceanothus megacarpus Alliance (2234)*  
     *Ceanothus megacarpus Association*  
     *Ceanothus megacarpus – Salvia mellifera Association*  
 2300 = *Californian Coastal Scrub Macrogroup (M044) (2300)*  
 2310 = *Californian Coastal-Foothill Seral Scrub Group (G782) (2310)*  
 2311 = *Diplacus aurantiacus Alliance (2311)*  
 2312 = *Ericameria linearifolia – Cleome isomeris Alliance (2312)*  
     *Ericameria linearifolia Association*  
 2313 = *Hazardia squarrosa – Ericameria palmeri Alliance (2313)*  
     *Ericameria palmeri Provisional Association*

- 2314 = Lotus scoparius – Lupinus albifrons – Eriodictyon spp. Alliance (2314)  
 Dendromecon rigida Association  
 Eriodictyon crassifolium Provisional Association  
 Lotus scoparius Association
- 2315 = Malacothamnus fasciculatus – Malacothamnus spp. Alliance (2315)  
 Malacothamnus fasciculatus Association  
 Malacothamnus fasciculatus – Salvia leucophylla Association
- 2320 = *Californian North Coastal & Mesic Scrub Group (G662) (2320)*  
 2321 = Baccharis pilularis Alliance (2321)  
 Baccharis pilularis – Artemisia californica Association
- 2322 = Toxicodendron diversilobum Alliance (2322)  
 Toxicodendron diversilobum – Artemisia californica / Leymus condensatus Association
- 2330 = *Central & Southern Californian Coastal Sage Scrub Group (G264) (2330)*  
 2331 = Artemisia californica – Salvia leucophylla Alliance (2331)  
 Artemisia californica Association  
 Artemisia californica – (Salvia leucophylla) / Leymus condensatus Association  
 Artemisia californica – Eriogonum cinereum Association  
 Artemisia californica – Eriogonum fasciculatum Association  
 Artemisia californica – Eriogonum fasciculatum – Opuntia littoralis / Dudleya (edulis) Association  
 Artemisia californica – Eriogonum fasciculatum – Salvia leucophylla Association  
 Artemisia californica – Eriogonum fasciculatum – Salvia mellifera Association  
 Artemisia californica – Salvia leucophylla Association  
 Artemisia californica – Salvia leucophylla – Eriogonum cinereum / Nassella spp. Assoc.  
 Artemisia californica / Nassella (pulchra) Association  
 Salvia leucophylla Association
- 2332 = Encelia californica – Eriogonum cinereum Alliance (2332)  
 Encelia californica Association  
 Encelia californica – Artemisia californica Association  
 Encelia californica – Eriogonum cinereum Association  
 Encelia californica – Malosma laurina – Salvia mellifera Association  
 Eriogonum cinereum Association
- 2333 = Eriogonum fasciculatum – Salvia apiana Alliance (2333)  
 Eriogonum fasciculatum Association  
 Eriogonum fasciculatum – Salvia apiana Association  
 Eriogonum fasciculatum – Salvia mellifera – Malosma laurina Association  
 Eriogonum fasciculatum var. foliolosum – Hesperoyucca whipplei Association  
 Salvia apiana Provisional Association  
 Salvia apiana – Artemisia californica – Ericameria spp. Association

- 2334 = *Salvia mellifera* – *Artemisia californica* Alliance (2334)
  - Salvia mellifera* Association
  - Salvia mellifera* – *Artemisia californica* – *Malosma laurina* Association
  - Salvia mellifera* – *Eriogonum cinereum* Association
  - Salvia mellifera* – *Eriogonum fasciculatum* Association
  - Salvia mellifera* – *Lotus scoparius* Association
  - Salvia mellifera* – *Malacothamnus fasciculatus* Association
  - Salvia mellifera* – *Rhus ovata* Association
- 2400 = *Californian Ruderal Grassland, Meadow & Scrub Macrogroup (M046) (2400)*
- 2410 = *Californian Ruderal Grassland, Meadow & Scrub Group (G497) (2410) (Exotic)*
  - 2411 = *Avena* spp. – *Bromus* spp. Semi-natural Alliance (2411) (Exotic)
    - Avena barbata* – *Avena fatua* Semi-natural Association
    - Bromus diandrus* – *Avena* spp. Semi-natural Association
    - Bromus diandrus* Semi-natural Association
    - Bromus hordeaceus* – *Erodium botrys* Semi-natural Association
    - Brachypodium distachyon* Semi-natural Association
  - 2412 = *Brassica nigra* – *Centaurea (solstitialis, melitensis)* Semi-natural Alliance (2412) (Exotic)
    - Brassica nigra* Semi-natural Association
    - Centaurea melitensis* Semi-natural Association
    - Hirschfeldia incana* Semi-natural Association
  - 2413 = *Conium maculatum* – *Foeniculum vulgare* Semi-natural Alliance (2413) (Exotic)
    - Foeniculum vulgare* Semi-natural Association
  - 2414 = *Lolium perenne* Semi-natural Alliance (2414) (Exotic)
    - Lolium perenne* Semi-natural Association
- 2500 = *Warm Interior Chaparral Macrogroup (M091) (2500)*
- 2510 = *Western Madrean Chaparral Group (G281) (2510)*
  - 2511 = *Rhus ovata* Alliance (2511)
    - Rhus ovata* Association
    - Rhus ovata* – *Salvia leucophylla* – *Artemisia californica* Association
- 2600 = *Southern Vancouverian Lowland Grassland & Shrubland Macrogroup (M050) (2600)*
- 2610 = *Southern Vancouverian Shrub & Herbaceous Bald, Bluff & Prairie Group (G488) (2610)*
  - 2611 = *Bromus carinatus* – *Elymus glaucus* Alliance (2611)
    - Pteridium aquilinum* – Grass Association
- 2700 = *Pacific Coastal Beach & Dune Macrogroup (M059) (2700)*
- 2710 = *Californian Coastal Beach & Dune Group (G663) (2710)*
  - 2711 = *Isocoma menziesii* Alliance (2711)
    - Isocoma menziesii* Association
    - Isocoma menziesii* – *Artemisia californica* Association



**3000 = Shrub & Herb Wetland Subclass (2.C.) (3000)**

3100 = *Vancouverian Lowland Marsh, Wet Meadow & Shrubland Macrogroup (M073)*  
(3100)

3110 = *Temperate Pacific Freshwater Wet Mudflat Group (G525)* (3110)

3111 = *Heterotheca (oregona, sessiliflora) Alliance* (3111) **Wetland**

*Heterotheca sessiliflora Provisional Association*

3112 = *Grindelia (camporum, stricta) Alliance* (3112) **Wetland**

*Ambrosia psilostachya – Grindelia hirsutula var. hallii Association*

3200 = *Arid West Interior Freshwater Marsh Macrogroup (M888)* (3200)

3210 = *Arid West Interior Freshwater Marsh Group (G531)* (3210) **Wetland**

3211 = *Schoenoplectus acutus – Schoenoplectus californicus Alliance* (3211)

**Wetland**

3212 = *Typha (angustifolia, domingensis, latifolia) Alliance* (3212) **Wetland**

3300 = *Western North American Ruderal Marsh, Wet Meadow & Shrubland Macrogroup*  
(M301) (3300)

3310 = *Western North American Ruderal Marsh, Wet Meadow & Shrubland Group*  
(G524) (3310)

3311 = *Phragmites australis ssp. australis – Arundo donax Semi-natural Alliance*  
(3311) **Wetland** (Exotic)

3312 = *Phalaris aquatica – Phalaris arundinacea Semi-natural Alliance* (3312)

**Wetland** (Exotic)

*Phalaris aquatica Semi-natural Association*

3400 = *Western North American Vernal Pool Macrogroup (M074)* (3400)

3410 = *Californian Vernal Pool Group (G530)* (3410) **Wetland**

3500 = *Warm Desert Lowland Freshwater Marsh, Wet Meadow & Shrubland*  
*Macrogroup (M076)* (3500)

3510 = *North American Warm Desert Riparian Low Bosque & Shrubland Group (G533)*  
(3510)

3511 = *Baccharis salicifolia Alliance* (3511) **Riparian**

*Baccharis salicifolia Association*

3512 = *Salix exigua Alliance* (3512) **Riparian**

*Salix exigua – Arundo donax Association*

*Salix exigua Association*

3513 = *Salix lasiolepis Alliance* (3513) **Riparian**

*Salix lasiolepis Association*

*Salix lasiolepis – Baccharis salicifolia Association*

3514 = *Sambucus nigra Alliance* (3514) **Riparian**

*Sambucus nigra Association*

3600 = *Warm & Cool Desert Alkali-Saline Marsh, Playa & Shrubland Macrogroup*  
(M082) (3600)

3610 = *North American Desert Alkaline-Saline Marsh & Playa Group (G538)* (3610)

3611 = *Distichlis spicata Alliance* (3611) **Wetland**

*Distichlis spicata – annual grasses Association*

*Distichlis spicata Association*

3612 = *Leymus cinereus – Leymus triticoides Alliance* (3612) **Wetland**

- 3620 = *North American Desert Alkaline-Saline Wet Scrub Group (G537) (3620)*  
 3621 = *Pluchea sericea Alliance (3621) Riparian*  
     *Pluchea sericea Association*  
 3622 = *Atriplex lentiformis Alliance (3622) Riparian*  
     *Atriplex lentiformis Association*
- 4000 = Desert & Semi-Desert Class (3.) (4000)**  
 4100 = *Mojave-Sonoran Semi-Desert Scrub (M088) Macrogroup (4100)*  
 4110 = *Baja Semi-Desert Coastal Succulent Scrub Group (G298) (4110)*  
 4111 = *Opuntia littoralis – Opuntia oricola – Cyllindropuntia prolifera Alliance (4111)*  
     *Cyllindropuntia prolifera – Mixed Coastal Scrub Provisional Association*  
     *Opuntia littoralis Association*  
     *Opuntia oricola Provisional Association*
- 4200 = *North American Warm Desert Ruderal Scrub & Grassland Macrogroup (M512) (4200)*  
 4210 = *North American Warm Desert Ruderal Grassland Group (G677) (4210)*  
 4211 = *Pennisetum setaceum – Pennisetum ciliare Semi-natural Alliance (4211) (Exotic)*  
     *Pennisetum setaceum Semi-natural Association*
- 4300 = *North American Warm-Desert Xeric-Riparian Scrub Macrogroup (M092) (4300)*  
 4310 = *Warm Semi-Desert Shrub & Herb Dry Wash & Colluvial Slope Group (G541) (4310)*  
 4311 = *Lepidospartum squamatum Alliance (4311) Riparian*  
     *Lepidospartum squamatum – Baccharis salicifolia Association*  
     *Lepidospartum squamatum – Eriogonum fasciculatum Association*  
     *Lepidospartum squamatum / ephemeral annuals Association*
- 5000 = Cool Semi-Desert Scrub & Grassland Subclass (3.B.) (5000)**  
 5100 = *Great Basin-Intermountain Tall Sagebrush Steppe & Shrubland Macrogroup (M169) (5100)*  
 5110 = *Intermountain Mesic & Dry Tall Sagebrush Steppe & Shrubland Group (G303 & G302) (5110)*  
     *5111 = Artemisia tridentata Alliance (5111)*
- 6000 = Open Rock Vegetation Class (6.) (6000)**  
 6100 = *Western North American Cliff, Scree & Rock Vegetation Macrogroup (M887) (6100)*  
 6110 = *Californian Cliff, Scree & Rock Vegetation Group (G563) (6110)*  
     *6111 = Selaginella bigelovii Alliance (6111)*  
         *Selaginella bigelovii / Eriogonum fasciculatum Association*  
     *6112 = Dudleya cymosa – Dudley lanceolata – Lichen/Moss Sparse Alliance (6112)*  
         *Lichen Gravel – Bedrock Nonvascular Sparse Association*  
     *6113 = Sparsely Vegetated/Barren (6113)*

**9000 = Miscellaneous Classes (9000)**

9100 = Sparsely Vegetated to Non-vegetated (9100)

9110 = Cleared Land (9110)

9120 = Sand/Gravel Bar (9120) **Riparian**

9130 = Rocky Streambed (9130) **Riparian**

9140 = Landslide (9140)

9150 = Firebreak (9150)

9200 = Agriculture (9200)

9300 = Urban (9300)

9310 = Urban Window (9310)

9400 = Exotic or Planted Trees and Shrubs (9400) **(Exotic)**

9500 = Artificial Cuts/Embankments (9500)

9510 = Exotic (9510) **(Exotic)**

9520 = Trees (9520)

9530 = Shrubs (9530)

9531 = Coastal Sage Scrub (9531)

9540 = Herbaceous to Sparsely Vegetated (9540)

9700 = Post-Fire (9700)

9800 = Water (9800) **Wetland**

9801 = Small Earthen Dammed Ponds (9801) **Wetland**

### **Other Attributes**

#### **Percent Cover - Woody (Conifer, Hardwood, Total Tree, Shrub)**

Absolute Cover 1% increment

nnn = Absolute Cover

000 = None or None Observable

999 = Not Applicable, Not Assessed

photo interpreted based on the following ranges:

0-2%

>2-10%

>10-25%

>25-40%

>40-60%

>60%

#### **Percent Cover – Herbaceous**

1 = 0-2%

2 = >2-10%

3 = >10-40%

4 = >40%

9 = Not Applicable, Not Assessed

#### **Roadedness Disturbance**

0 = No observed roads or trails.

1 = Minimal Roadedness: Less than one-third of the polygon is crossed by roads or trails. Polygons adjacent to paved roads are also placed into this category.

2 = Moderate Roadedness: Between one-third and two-thirds of the polygon is crossed by roads or trails.

3 = High Roadedness: Over two-thirds of the polygon is crossed by roads or trails.

9 = Not Applicable/Not Assigned

#### **Anthropogenically Altered Disturbance (Clearing)**

0 = No observed clearing

1 = Minimal Anthropogenic Clearing: Less than one-third of the polygon has been cleared of at least the understory vegetation.

2 = Moderate Anthropogenic Clearing: Between one-third and two-thirds of the polygon has been cleared of at least the understory vegetation.

3 = High Anthropogenic Clearing: Over two-thirds of the polygon has been cleared of at least the understory vegetation.

9 = Not Applicable/Not Assigned

### Exotics (Invasives)

0 = Little or No Observable Invasive Plant Cover: Less than 5%

1 = Low Invasive Plant Cover: Less than 33% of the polygon but over 5% is covered with invasive plants.

2 = Moderate Invasive Plant Cover: Between 33% and 66% of the polygon is covered with invasive plants.

3 = High Invasive Plant Cover: Over 66% of the polygon's area is covered with invasive plants.

9 = Not Applicable/Not Assigned

### Land Use

0000 = Not Assessed

1000 = Urban

1436 = Water Transfer

1850 = Wildlife Preserves and Sanctuaries

2000 = Agriculture (includes nurseries)

2100 = Non-woody row and field crops

2200 = Orchards & Vineyards

2300 = Improved Pastureland (irrigated)

3500 = Vacant Land – Restoration

9800 = Undifferentiated Water

9810 = Water Impoundment Feature

### Tree Height

01 = <.5m

02 = >.5-1m

03 = >1-2m

04 = >2-5m

05 = >5-10m

06 = >10-15m

07 = >15-20m

08 = >20-35m

09 = >35-50m

10 = >50m

99 = Not Applicable/Not Assessed

### California Wildlife Habitat Relations (CWHR) Tree Size Class

1 = Seedlings (<1" dbh)

2 = Saplings (>1"-6" dbh)

3 = Pole (>6"-11" dbh)

4 = Small (>11"-24" dbh)

5 = Medium-large (>24" dbh)

6 = Multi-layered medium-large trees over smaller trees in densities >60%

9 = Not Applicable/Not Assessed

#### Method ID

- 01 = Rapid Assessment (current project)
- 02 = Releve
- 03 = Field Verification
- 04 = Photointerpretation
- 05 = Adjacent stand information or photo
- 06 = Reconnaissance (current project)
- 07 = Other information
- 08 = Older plot data
- 09 = Older recon data
- 10 = Accuracy Assessment
- 60 = Inconsequential Project Information

#### Note

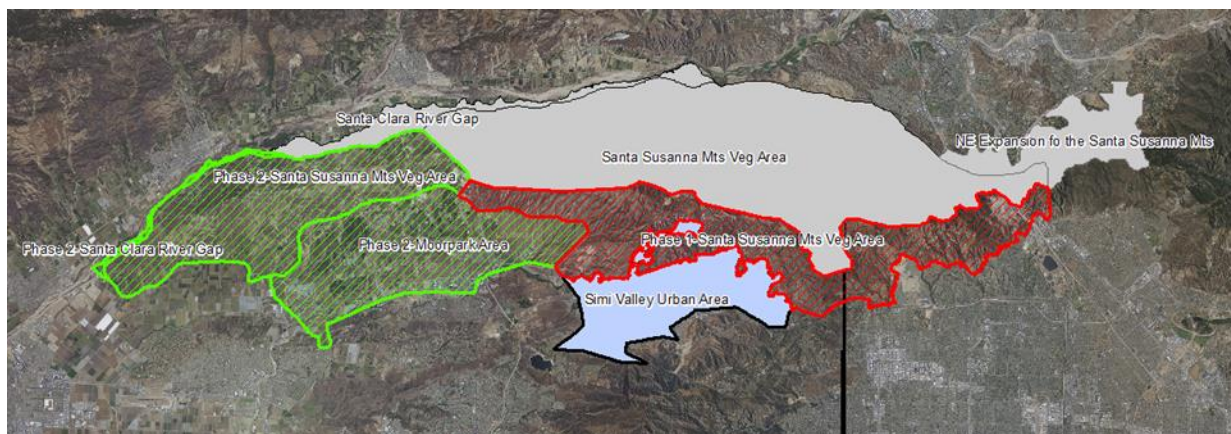
A Comment Field in the database used to add any pertinent additional information, such as significant additional species present not accounted for in the alliance or association name.

## Appendix E: Phase 2 Field Reconnaissance Report (AIS)

### The US Fish & Wildlife Service Santa Susana Mountains Vegetation Mapping Project Photo Interpretation Field Reconnaissance Report September 13-16, 2021

#### Introduction

The Simi Valley – Santa Susana Mountains Ecological Subsection Vegetation Mapping Project (SASU), which includes Moorpark and the Northeast Expansion areas, is a 155,519-acre study area that has been divided into a multi-phased effort based on the availability of funding (see Figure 1 below). Phase 1, completed in 2019 covers 28,900 acres (red hatched area in Figure 1 below). Phase 2 is the current mapping effort, which consists of 48,700 acres covering the Moorpark and western portion of the study area (green hatched area in Figure 1 below).



**Figure 1:** Shows the entire study areas - Phase 1 in red, Phase 2 in green, Simi Valley Urban area in blue, and remaining areas to be mapped in grey.

This report summarizes the itinerary and observations of the Aerial Information Systems (AIS) photo interpreters during their field trip to the Santa Susana Mountains study area. The field trip was conducted from Monday, September 13 through Thursday, September 16, 2021.

Field reconnaissance visits serve two major functions. First, they enable photo interpreters to relate the vegetation on the ground at each observation site to the signatures on the aerial imagery. Second, with guidance from ecologists in the field, the photo interpreters become familiar with the flora, vegetation assemblages, and local ecology of the study area. At the same time, ecologists gain understanding from the photo interpreter's perspective about assessing vegetation through the framework of map creation. In summary, the field session is a means of acquainting the photo interpreters with the species and vegetation type distribution, ecology and trends within

the study area, as well as for answering signature questions. In addition, the photo interpreters can use and test the vegetation classification key and provide feedback for modifications.

**Personnel from AIS involved in the field trip were as follows:**

Edward Reyes, AIS Senior Photo interpreter  
Arin Glass, AIS Photo interpreter  
Todd Keeler-Wolf, CDFW Senior State Ecologist (retired)

Prior to the field reconnaissance, AIS staff performed several in-house tasks in preparation to facilitate a more organized trip. Field routes were planned to accommodate a variety of factors including: maximizing the number of vegetation types and regional zones visited while addressing accessibility and time constraint considerations.

The imagery was reviewed for representative signatures of different vegetation types, density and abiotic factors such as percent slope, aspect, shape of the slope, elevation, substrate, landform, etc. Locations of field check sites were assigned into a database. Multiple sites were chosen to provide alternatives if one or more sites proved inaccessible.

The selected sites and the 2020 base digital imagery were downloaded to an Apple iPad with ArcGIS Collector software. Other ancillary data, such as the 2018 Classification plot locations and data, and roads database were also downloaded for reference.

Public landowners (Parks and Open Space) were contacted in order to assure access to the area through locked gates. The Mountains Recreation and Conservancy Authority, Rancho Simi Parks and Recreation District, The Nature Conservancy (TNC), and Bureau of Land Management (BLM) were contacted and any necessary gate or road condition information was obtained.

During the trip, the area was traversed by 4WD vehicle and on foot, with stops at selected sites (See Figure 2 for site locations). At each site visited, GPS coordinates were noted along with ground information that was recorded on the tablet. Areas encountered in transit between sites, and areas of noteworthy or unusual significance, were added in the field as reconnaissance points. In addition, reconnaissance points were captured to mark the transition between vegetation types, with the intent of helping photo interpreters determine the edges of stands. A single reconnaissance point may have contained information about two or more stands. It was also possible for a given stand to be assessed in multiple places. Some stands of vegetation were remotely observed at a distance with the aid of binoculars. The location of these remote stands was determined using a compass and laser rangefinder, as well as the imagery on the tablet. The ecologist assisted in species identification and ecology, as well as in



discussion of trends involving vegetative transition across the landscape, and the floristic vegetation classification.

The crew took digital color ground photos at many reconnaissance points. The frame number, direction the photographer was facing, and other information about the photo were recorded in the field and later input into computer files for easy reference. For the mapping effort, the field data and ground photos were essential for correlating conditions seen on the aerial imagery to conditions on the ground.

## Itinerary

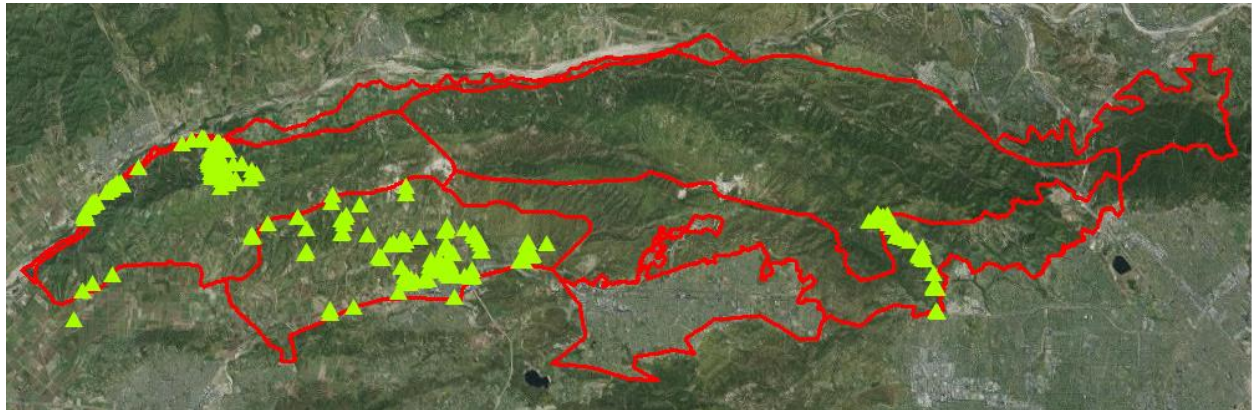


Figure 2: Depicts study area boundaries in red with current field locations in green

### **Monday, September 13, 2021 – Moorpark urban interface, Rustic Canyon/Happy Camp Canyon, and Walnut Canyon Areas**

The field team accessed the Phase 2 study area from the south on CA 118 freeway in Simi Valley. They headed north on Collins Drive for a short distance before turning east onto Campus Park Drive and then north on Campus Road to view into the adjacent canyon to the east of Moorpark College.

The crew returned to Campus Park Drive driving west along the road until it bends north and turns into Happy Camp Canyon Road, where the team checked stands along the edge of Happy Camp Regional Park and Rustic Canyon golf course. They backtracked south to Campus Park Drive and turned south onto Princeton Avenue, following it as it bends to west paralleling the north side of the Arroyo Simi wash.

They then ventured north on Spring Road until it meets up with Walnut Canyon Road, where the team drove north a short distance before turning around heading south. The crew turned west onto Meridian Hills Drive and followed it until it dead ended, there they checked disturbed stands along the edge of a suburban development, before returning onto Walnut Canyon Road and continuing south until it met CA 118 freeway where they drove east out of the study area.

The image below shows the Moorpark College area with reconnaissance point location in green and the study area in red.



The image below shows the area near the Arroyo Simi Wash and CA 118 freeway. Reconnaissance points are depicted in green and the study area in red.

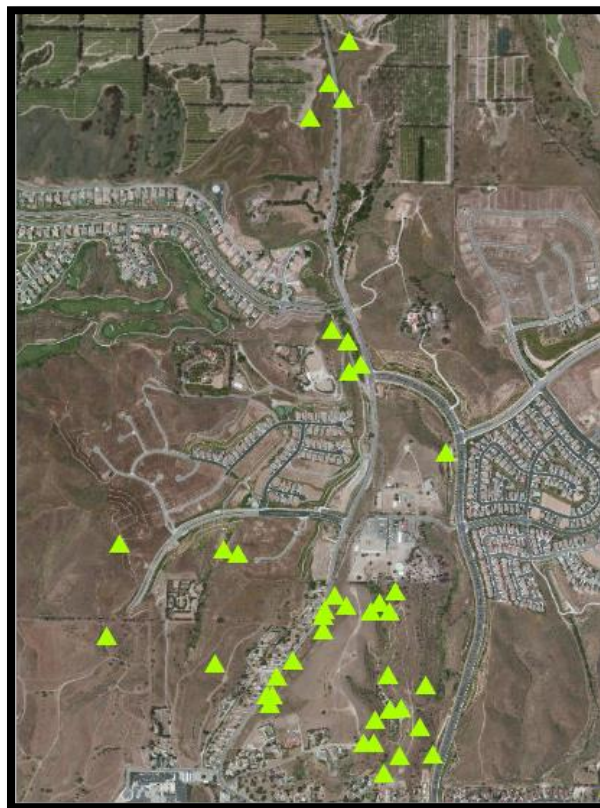




The image below shows a portion of the study area within Rustic Canyon and Happy Camp Canyon Regional Park near Rustic Canyon Golf Course. Reconnaissance point locations are shown in green.



The image below shows a portion of the study area near CA 23, Spring Road, and Meridian Hills Road. Reconnaissance point locations are shown in green.



**Tuesday, September 14, 2021 – TNC land, Willard Canyon Road, BLM land**

The field crew accessed the Phase 2 study area via the CA 118 freeway to CA 23 as it goes north and turns into Grimes Canyon Road, traversing the Santa Susana range from south to north. In the Santa Clara River Valley, the team turned west on Bardsdale Avenue briefly before turning south on South Sespe Street, and then west onto South Mountain Road. The crew followed the road until it dead-ended into The Nature Conservancy land (TNC). The team walked along the northern edge of the mountains, viewing into stands that had burned in October of 2019.

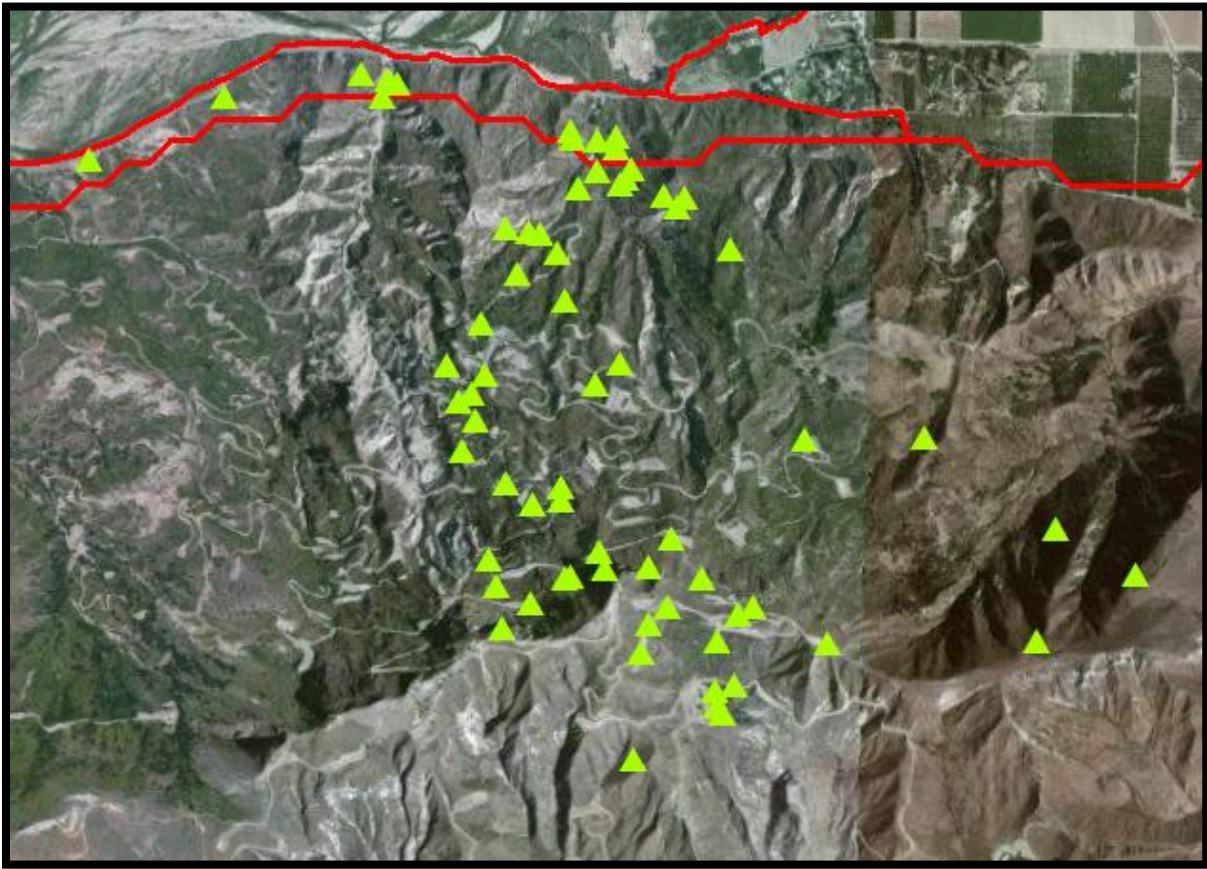
After returning to the car, they backtracked east to Willard Canyon Road, where they drove south into an oil field area along the north side of the Santa Susana Mountains. In the lower hills, the team hiked on an old powerline road to view stands of *Malosma laurina* and *Artemisia californica*. Returning to the car, the crew continued to ascend the north side, checking stands along the way, until reaching the ridgeline where they access a small Bureau of Land Management (BLM) parcel. Then the team backtracked to South Mountain Road following it east until turning south on Balcom Canyon Road, and then east again on CA 118 before exiting the study area for the day.

The screen shot below depicts the field points taken along South Mountain Road and on TNC property.





The image below shows reconnaissance points in Willard Canyon, along Willard Canyon Road, and on BLM property.

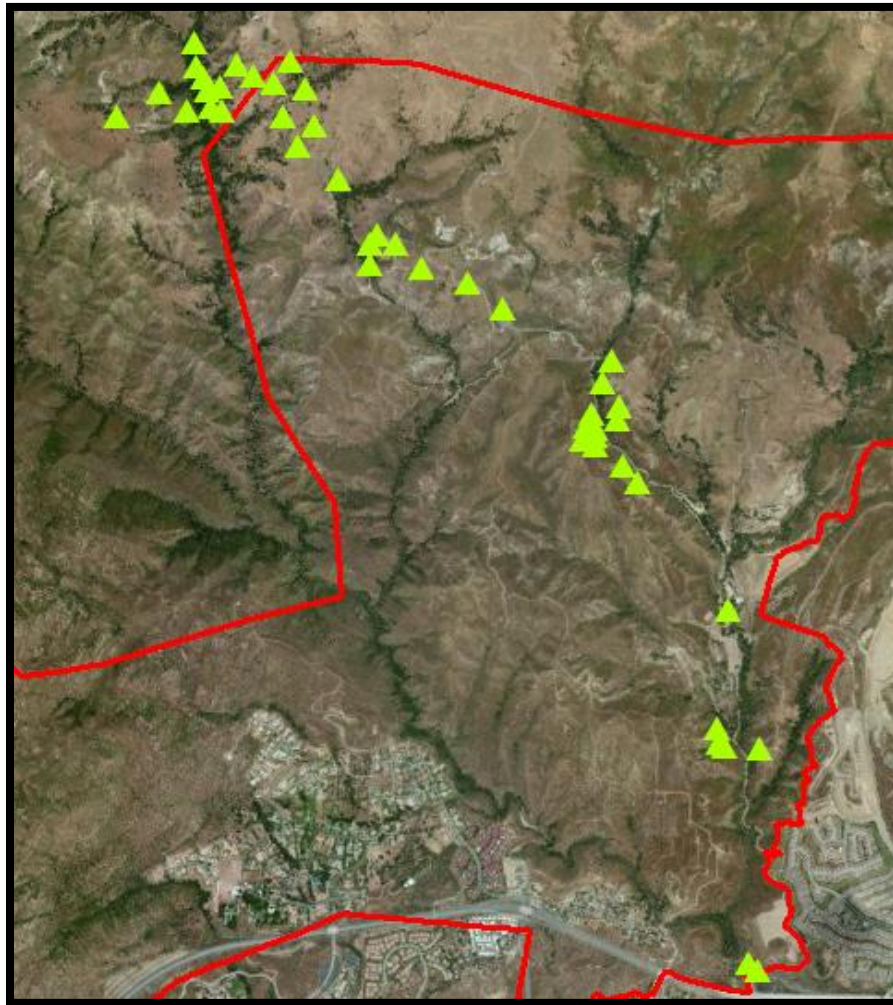


**Wednesday, September 15, 2021 – Brown’s Canyon Road, Oat Mountain Road, Devil’s Canyon**

The field team visited areas within the Phase 1 study area to review the past mapping and classification, and test the vegetation key. They accessed the study area on Brown’s Canyon Road via the CA 118 freeway and De Soto Avenue in Chatsworth.

The crew drove up Brown’s Canyon Road for approximately three miles to the Oat Mountain road, where they ascended to the upper third of the slope before returning to Brown’s Canyon Road and continued to the northwest until they reached a locked gate near the northern edge of the Phase 1 study area. A short hiking excursion was conducted in Devil’s Canyon where live oak and riparian stands were occurring. After the hike, the field crew then backtracked on the same route, returning to the CA 118 freeway at the end of the day.

The image below depicts reconnaissance points recorded along Brown's Canyon and Oat Mountain Roads, as well as on a hike into Devil's Canyon.



**Thursday, September 16, 2021 – Moorpark Urban interface**

The field team accessed the Phase 2 study area via the CA 118 freeway and Los Angeles Avenue. After viewing disturbed riparian and exotic stands along the Arroyo Simi wash, the team turned north onto Spring Street and checked disturbed riparian stands with mixes of exotic and native trees and shrubs. The team then turned south on CA 23/Walnut Canyon Road/Moorpark Ave., checking roadside stands, before turning east on Wick's Road and driving until the road dead ended along the edge of an approximate 120-acre tract of open space.

The field crew walked a short distance onto the disturbed hills to view a small canyon dominated by exotic trees such as *Eucalyptus* spp. and *Schinus molle*. The team then returned to the car and backtracked to CA 23, turning south for a short distance before turning west onto Poindexter Ave. After verifying exotic trees in a disturbed grassland area, they turned north onto Gabbert Road checking stands along the road before turning around and backtracking to CA 23 north. The team turned west once they



reached Championship Drive and viewed a riparian stand mixed with a high cover of exotic species. They turned southwest onto Grimes Canyon Road checking exotic tree stands and highly disturbed coastal sage scrub stands. The crew then turned north onto Maria Drive until they were blocked by a locked gate.

Returning to Grimes and continuing southwest, the team turned west onto CA 118/Los Angeles Ave to check riparian and exotic stands along the north side of Arroyo Las Posas. They then turned north onto Balcom Canyon Road, followed along as it bent to the west before transitioning onto Bradley Road. Driving southwest the team turned west onto Berylwood Road and continued to skirt the southern edge of the mountains along La Loma Ave. Much of the southwestern area of Phase 2 was occupied by gated ranches and agriculture, which limited access to the southern slopes in this area. The team eventually exited the study area and began to make their way home on CA 118/Los Angeles Ave., ending the field week.

In the image below, the green triangles represent reconnaissance points taken along CA 23/Walnut Canyon Road, Spring Road, and Wick's Road.



The screen shot below shows the reconnaissance points, displayed as green triangles, recorded along Gabbert Road and CA 118.



The image below depicts reconnaissance points along Championship Drive, Grimes Canyon Road, and Maria Drive.





The image below shows the green reconnaissance points taken along Balcom Canyon Road, Stockton Road, Bradley Road.



The green reconnaissance points in the image below were taken along the CA 118 in disturbed riparian stands of the Arroyo Las Posas wash.



The image below shows the field points recorded along La Loma Avenue and CA 118.



### **The Vegetation**

The below average precipitation in the winter of 2020-21 and continued exceptional drought conditions have resulted in very poor conditions for vegetation vitality in the late summer/early fall field week. The vegetation was very dried out, with many of the trees and shrubs exhibiting drought deciduous conditions. Non-native grasslands were prevalent throughout the study area and were past peak phenology at the time of the visit.

### **Moorpark and Las Posas Urban/Agricultural Interface Area**

The vegetation on the south side of the main ridgeline peaks, South Mountain (~2300ft) and Oak Ridge (~1900ft), interfaces with significant urban and agricultural encroachment. Most of the southerly slopes west of Coyote and Fox Canyons were burned in late October of 2019.

Nonnative trees such as *Eucalyptus* spp., *Robinia pseudoacacia*, *Schinus molle*, *Ailanthus altissima*, and many other planted and/or escaped exotics are common in this disturbance zone. Emergent stands of *Schinus molle* frequently occurred over drought stressed coastal sage scrub, with *Sambucus nigra*, *Artemisia californica*, *Opuntia littoralis*, and *Baccharis pilularis* as common understory components. Other exotics found in this portion include *Nicotiana glauca*, *Rhus lancea*, *Washingtonia* spp., and *Olea* spp.

Native plant stands primarily consist of oak woodlands and coastal sage scrub mixtures. *Quercus agrifolia* stands are limited to protected canyon bottoms and draws, with fragmented riparian components of *Platanus racemosa*, *Salix lasiolepis*, and *Baccharis salicifolia*. Along the toe slopes in the lower hills, small open stands of *Juglans californica* occurred over sparse to dense coastal sage scrub with a high cover of annual grasses.

*Artemisia californica* and *Salvia leucophylla* stands are most common in this area, with portions containing clusters of *Opuntia littoralis*. As one progresses west towards the coast, *Encelia californica* appears more frequently along directly south-facing slopes. *Rhus integrifolia* stands also increase in frequency the closer in proximity they are to the coast. *Rhus ovata* and *Heteromeles arbutifolia* distributions were more restricted to cooler protected slopes. *Malacothamnus fasciculatum* patches were limited to low slope swales and coves, often intermingling with a variety of coastal sage species.

Along the southern edge of the Phase 2 project area, the field crew visited disturbed lower hilltops and canyons flanked by land use. *Acmispon glaber*, *Hazardia squarrosa*, and *Ericameria palmeri* were early colonizers following human disturbance activities such as scraping, mowing, grazing, etc. Both planted native and nonnative embankments were observed buffering the edges of housing developments, golf courses, roads, and freeways. *Eriogonum fasciculatum*, *Artemisia californica*, *Acmispon glaber*, and *Salvia apiana* were the most common native species planted on roadside embankments.

Happy Camp Canyon wash was dominated by *Lepidospartum squamatum* with components of *Baccharis pilularis* and *Peritoma arborea*. Pockets of emergent *Sambucus nigra* and *Juglans californica* occurred on the slightly elevated margins of the terrace and floodplain.

The Arroyo Simi wash, running through the Moorpark area, is littered with large pockets of *Arundo donax*, along with many other exotics like *Eucalyptus* and *Schinus* species.

### **Brown's Canyon (Phase 1 area)**

Brown's Canyon, in the eastern Santa Susana Mountains, trends northwest southeast in the upper canyon, then turns to a north south direction at its lower reaches, as it flows to the northwest San Fernando Valley. The canyon bottom ranges from 1100 feet to upwards of 2000 feet. The adjacent slopes rise up to approximately 1700 feet at the lower part of the canyon, and up to 2400 to 2500 feet at the upper canyon. The upper ridge of Oat Mountain is at about 3400 to 3600 feet. The area burned in 2008.

Lower Brown's Canyon has a well-developed riparian zone consisting of *Salix laevigata*, *Salix lasiolepis*, with some *Populus fremontii*, *Platanus racemosa*, and *Quercus agrifolia*. Up canyon *Quercus agrifolia* and *Platanus* increase in frequency. Narrow runs of *Baccharis salicifolia* or *Salix lasiolepis* occur where trees open up. *Salix exigua* was also noted as a minor component in the drainage bottoms. On warmer southwest-facing slopes within the lower portion of the canyon, *Adenostoma fasciculatum* was observed with *Salvia mellifera* and *Malosma laurina*. *Eriogonum fasciculatum* inclusions would



occur within these stands in proximity to eroded cliffs and rock outcrops. *Artemisia californica* would begin to intersperse with the *A. fasciculatum* and *S. mellifera* as the slope aspect turns to the southeast. Some northeast to northwest aspects contained small populations of *Ceanothus crassifolius* and *Cercocarpus montanus* mixed with coastal sage scrub. Stands in this lower portion frequently were more fragmented and impacted by exotics and human disturbance, resulting in overall smaller stands with uneven distribution of cover.

Ascending into the mid-to-upper portion of Brown's canyon, *Artemisia californica* increased in cover on northeast slopes, along with *Salvia leucophylla* and *Malosma laurina*. *Salvia apiana* was observed on some upper slope hilltops. Larger stands of *Adenostoma fasciculatum* and *Salvia mellifera* were observed on the convex ridgelines and southwesterly slopes. *Heteromeles arbutifolia* and *Rhus ovata* stands occurred on protected north to east-facing slopes, mixing with other coastal sage scrub and chaparral components. Higher up the canyon, *Ceanothus crassifolius* increased in frequency and distribution on the northeast-facing toe slopes, along with small patches of *Cercocarpus montanus* on steeply eroded upper east-facing slopes. Drier southerly slopes had *Eriogonum fasciculatum*, *Artemisia californica*, and *Hesperoyucca whipplei*. Small clusters of *Quercus berberidifolia* were observed as a component to stands on northwest-facing toe slopes.

In the transition area between Ybarra and Brown's canyons, *Malacothamnus fasciculatus* were observed in protected swales down from the road. *Artemisia californica* with *Salvia mellifera* were noted on northerly slopes. *Adenostoma fasciculatum* with and without *Salvia mellifera* continued up the canyon. *Eriodictyon crassifolius* was noted in several grassy stands. Some exposed rocky areas contained *Eriogonum fasciculatum*, *Artemisia californica*, and *Salvia apiana*.

The team drove upslope for a short distance on Oat Mountain Road onto a broad spur where large nonnative dominated grasslands occur and grazing was evident. Varying mixtures of *Artemisia californica*, *Salvia mellifera*, *Malosma laurina*, *Eriogonum fasciculatum*, and *Salvia apiana* continued to be observed on less grassy slopes nearby. Along the upper portion of Brown's Canyon Road, the team reached a locked gate near the edge of the Phase 1 boundary and hiked down into Devil's Canyon. On the way down the moderately steep slope into the canyon, *Juglans californica*, *Quercus agrifolia*, *Baccharis salicifolia*, and *Quercus lobata* intermingled with one another. *Quercus lobata* was more limited in cover and distribution along the main drainage, with *Quercus agrifolia* dominating cover and a narrow intermittent string of *Platanus* running through the bottom. *Cercocarpus montanus* was mixed with *Adenostoma fasciculatum*, *Ceanothus crassifolius*, and *Heteromeles arbutifolia* on a steep east-facing low slope nearby. *Juglans* cover diminished in the drainage bottom, infrequently occurring under the oak canopy, however increased in cover along the adjacent fringes, upslope. Another lower slope stand was observed containing a mix of *Artemisia californica*, *Salvia apiana*, and *Eriodictyon crassifolium*.

### **Willard Canyon Road and BLM land**

Willard Canyon Road ascends a north south trending drainage in the western Santa Susana Mountains flowing northward to the Santa Clara River Valley. Elevation at the



mouth of the canyon is approximately 300 feet. The general north slope is pock marked with old oil pumps on cement pads with roads crisscrossing all the way up to a BLM parcel along the South Mountain ridgeline at about 2300 feet. Most of this area has not burned since 2003. The impact of the drought was not as evident in the coastal sage scrub layer along this cooler side, however on the more exposed facets; the *Malosma laurina* crowns had dropped many of their leaves in response to increasing aridity.

*Quercus agrifolia* stands pocket the most protected draws and toe slopes in the area, with the deeper canyons and major drainage corridors boasting a greater abundance of trees. Small populations of *Populus fremontii* and *Salix lasiolepis* were observed in drainage bottoms. *Juglans californica* stands appeared slightly upslope and adjacent to the oak dominated draws, as well as on north facing neutral slopes over dense coastal sage scrub. Exotic trees such as *Schinus molle*, *Eucalyptus* spp., and *Ailanthus altissima* lined the edges of the oil pump footprints.

Coastal sage scrub stands dominate the majority of slopes in the area, with variable combinations of *Salvia leucophylla* and *Artemisia californica*. *Hesperoyucca whipplei* and *Eriogonum fasciculatum* occur on crumbling eroded cliffs in the area, but this type is rarely mapped on these friable substrates since it allows for too many other shrubs and herbs to gain a foothold as well, thus being a small component to other types; usually the *Artemisia californica*-*Salvia leucophylla* Alliance. *Rhus integrifolia* and *Heteromeles arbutifolia* are also common associates to *A. californica* and *S. leucophylla* along more protected aspects (north to east) and lower slope positions. *Malosma laurina* replaces *R. integrifolia* as the co-dominant tall shrub component to the coastal sage scrub on more exposed aspects and slopes. Narrow *Baccharis pilularis* stands line the swales and concave slopes in the area.

Along the general north side, a common native herbaceous component to the shrub and tree stands is *Elymus condensatus*. The general north slopes in the area also had limited distribution of *Nassella* sp. Presence of nonnative annuals were still present, but not as abundant as on the south side of the main ridgeline.

The BLM tract is located along the crest of South Mountain and spills over to the upper south face. A 2019 fire burned up to the edge of this area, but the majority of stands viewed had not burned since 2003. More consolidated rock outcrops were viewed along the ridgeline, in contrast to the friable substrate found on lower slopes, where *Dudleya* spp. and lichen sparsely cling to the harder rock substrate. *Encelia californica* begins to appear again on directly south-facing aspects.

#### **TNC land and Western Santa Susana 2019 burn area**

A 2019 wildfire burned most of the area west of Willard Canyon on the north side and west of Fox and Coyote Canyons on the south side, all the way to the western edge of the Phase 2 study area. The TNC property was also affected by the fire, burning through most of the area (including the 2018 CNPS plot locations) except for some of the most protected aspects.

In the area just south of Richardson Canyon, springs feeding protected draws exhibited resprouting *Salix laevigata*, *Populus trichocarpa*, *Salix lasiolepis* with components of

*Toxicodendron diversilobum*, *Sambucus nigra*, *Baccharis salicifolia*, *Baccharis pilularis*, and *Elymus condensatus*. Highly erodible sandstone cliffs were sparsely vegetated with an uneven mix of *Artemisia californica*, *Salvia leucophylla*, *Atriplex lentiformis*, *Hesperoyucca whipplei*, and *Hazardia* sp. Along the north- to east-facing side slopes above the drainage bottoms, crown-sprouting mixtures of *Rhus integrifolia*, *Rhus ovata*, and *Heteromeles arbutifolia*, with *Artemisia californica* and *Salvia leucophylla* were observed. Planted *Eucalyptus* spp. and *Schinus molle* lined portions of South Mountain Road.

A little further south where TNC property begins, the terrain changes to a slightly more exposed northwest-west aspect where the canyons and swales are less protected, and riparian species are absent in the drainage bottoms. Nonnative annuals like *Brassica nigra* and *Salsola tragus* increase in cover and distribution. Resprouting *Toxicodendron diversilobum*, *Sambucus nigra*, *Baccharis pilularis*, and *Elymus condensatus* are common associates in place of the riparian trees and shrubs. The northerly side slopes contained sparse stands of *Rhus integrifolia* and *Artemisia californica*, most of which were in unburned coves or steep slopes that the fire did burn completely. Due to below average rainfall the previous winter, many of the previously burned coastal sage scrub stands have not come back yet. The prevailing northwest winds are likely the culprit for dispersing nonnative seeds up the westerly slopes from the highly disturbed Santa Paula valley below.

### **Other Issues**

Throughout the field week, AIS and Todd Keeler-Wolf talked about multiple issues and clarifications that may need to be discussed and implemented into the floristic key created by CNPS. AIS will compile these questions and correspond with CDFW, CNPS, and/or USFWS (Will Miller and others). Additionally, during Phase 1, Will Miller noted the importance of cactus stands as habitat for Cactus Wren. We discussed, at that time, that AIS would then look for and identify cactus patches within other alliances, such as the *Artemisia californica*-*Salvia leucophylla* Alliance, which does have an association with cactus.

**Appendix F: Phase 2 Field Reconnaissance Report (AIS)**  
**The US Fish & Wildlife Service**  
**Santa Susana Mountains Vegetation Mapping Project**  
**Ground Truth Field Reconnaissance Report**  
**May 02-05, 2022**

**Introduction**

The Simi Valley – Santa Susana Mountains Ecological Subsection Vegetation Mapping Project (SASU), which includes Moorpark and the Northeast Expansion areas, is a 155,519-acre study area that has been divided into a multi-phased effort based on the availability of funding (see Figure 1 below). Phase 1 was completed in 2019 and covers 28,900 acres (red hatched area in Figure 1 below). Phase 2 is the current mapping effort, which consists of 48,700 acres covering the Moorpark and western portion of the study area (green hatched area in Figure 1 below).



**Figure 1:** Shows the full extent of the entire study area - Phase 1 in red, Phase 2 in green, Simi Valley Urban area in blue, and remaining areas to be mapped in grey.

This report summarizes the itinerary and observations of the Aerial Information Systems (AIS) photo interpreters during their field trip to the Phase 2 portion of the Santa Susana Mountains study area. The field trip was conducted from Monday, May 2, 2022 through Thursday, May 5, 2022.

The ground-truth field reconnaissance effort serves multiple purposes. First, it enables the photo interpreters to check the photo interpretation and mapping (vegetation stand delineations and attribute coding) of the preliminary vegetation map units for the area. The field effort also verifies the photo interpreters understanding of the plant species and vegetation type distribution, ecology, and trends within the study area, as well as answering photo interpretation questions encountered during the mapping process. In addition, the photo interpreters use their time in the field to test the vegetation classification and key and provide feedback to the classifiers for modifications.

**Personnel from AIS involved in the field trip were as follows:**

Edward Reyes, AIS Senior Photo interpreter  
Arin Glass, AIS Photo interpreter

Prior to the field reconnaissance, staff performed several in-house tasks in preparation to facilitate a more organized trip. Field routes were planned to accommodate a variety of factors including: maximizing the number of vegetation types and regional zones visited while addressing accessibility and time constraint considerations.

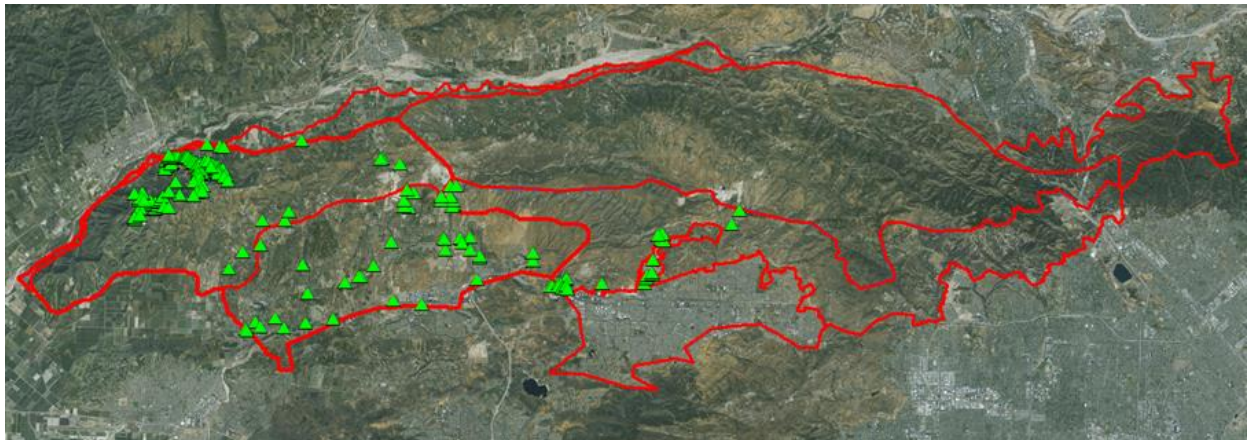
The preliminary vegetation map database had a number of polygons and/or areas flagged for further review in the field. These selected sites and the 2020 base digital imagery were downloaded to an Apple iPad with ArcGIS Collector software. Other ancillary data, such as the 2018 Classification plot locations and data, and roads database were also downloaded for reference.

Public landowners (Parks and Open Space) were contacted in order to assure access to the area through locked gates. The Mountains Recreation and Conservancy Authority, Rancho Simi Parks and Recreation District, The Nature Conservancy (TNC), and Bureau of Land Management (BLM) were contacted and any necessary gate or road condition information was obtained.

During the trip, the area was traversed by 4WD vehicle and on foot, with stops at selected sites. At each site visited, GPS coordinates were noted along with ground information that was recorded on the tablet. Areas encountered in transit between sites were also checked for their map delineation and attribute coding. In addition, areas of noteworthy or unusual significance were added in the field as additional ground-truth reconnaissance points. A single reconnaissance point may have contained information about two or more stands. It was also possible for a given stand to be assessed in multiple places. Some stands of vegetation were remotely observed at a distance with the aid of binoculars. The location of these remote stands was determined using a compass and laser rangefinder, as well as the imagery on the tablet. The photo interpreters also looked for trends involving vegetative transition across the landscape and the reviewed the floristic vegetation classification and key.

The crew took digital color ground photos at many reconnaissance points. The frame number, direction the photographer was facing, and other information about the photo were recorded in the field and later input into computer files for easy reference. For the mapping effort, the field data and ground photos are essential for correlating conditions seen on the aerial imagery to conditions on the ground.

## Itinerary



**Figure 2:** Depicts the entire Santa Susana Mountains study area boundaries in red with current field locations in green

### **Monday, May 2, 2022 – Moorpark urban interface, Rustic Canyon/Happy Camp Canyon, and Walnut Canyon Areas:**

The field team accessed the Phase 2 study area from the south on CA 118 freeway in Simi Valley. They headed north on Collins Drive for a short distance before turning east onto Campus Park Drive and then north on Campus Road to view into the adjacent canyon to the east of Moorpark College. The crew returned to Campus Park Drive traveling west along the road until it bends north and turns into Happy Camp Canyon Road, where the team checked stands along the edge of Happy Camp Regional Park and Rustic Canyon golf course. The field team proceeded to park and walk across the wash running along the west side of the golf clubhouse, checking stands on east-facing slopes. They returned to the car and backtracked south to Campus Park Drive and turned south onto Princeton Avenue, following it as it bends to the west paralleling the north side of the Arroyo Simi wash.

The crew then ventured north on Spring Road, checking roadside stands, before turning north on CA 23/Walnut Canyon Road. Where CA 23 transitions between Walnut Canyon Road and Broadway Road the team diverged north onto Happy Camp Road. The team followed Happy Camp Road northeast where Phase 1 and 2 study areas meet, checking stands all the way to the edge of Phase 1 study area boundary. After turning around the crew backtracked on Happy Camp Road until turning west onto Roseland Ave, where they drove north until reaching a locked gate near the Phase 1 and 2 boundary. The team then returned to CA 23 travelling west, following it to the north, checking roadside stands along the way. The crew tried turning onto Waynes Road, which leads into a quarry, but could not advance past a locked gate. Turning back a short distance to the south, the field crew drove east on Shekell Road to check a few stands before once again having to turn around at a locked quarry gate. After returning to CA 23 and turning to the south, they followed Grimes Canyon Road where it splits from CA23 to the southwest. The team verified stands along Grimes Canyon Road until it reached CA 118/Los Angeles Avenue. They then ended the day driving east back to the hotel on CA 118.



The image below shows a canyon just east of the Moorpark College campus with verification point location in green.



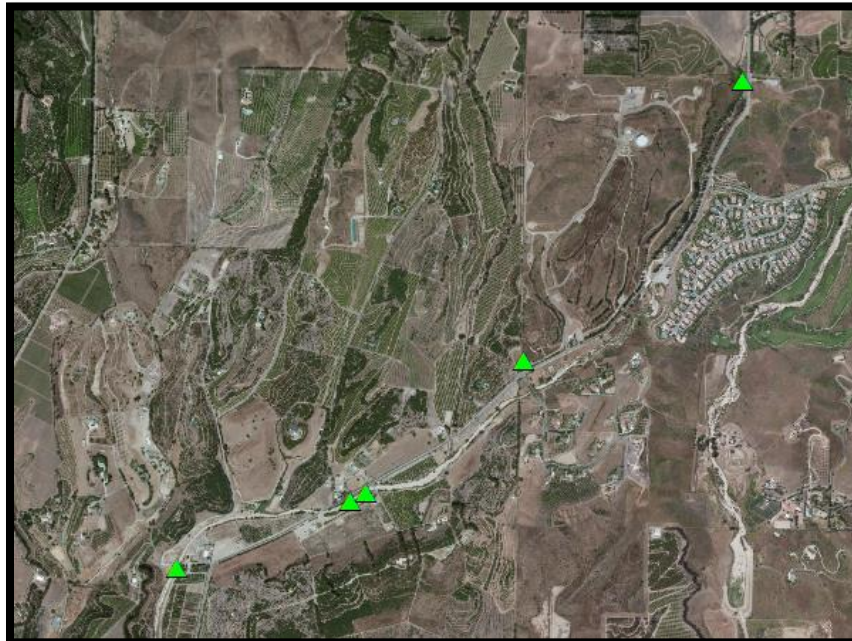
The image below shows the green verification points along CA 23 in the west and Happy Camp drainage next to the Rustic Canyon golf course in the east.



The image below shows a portion of the Phase 1 study area (eastern third of figure) and Phase 2 area (western half of figure) with verification points along Happy Camp Road and Roseland Avenue.



The image below shows a portion of the study area with green verification points running along Grimes Canyon Road.



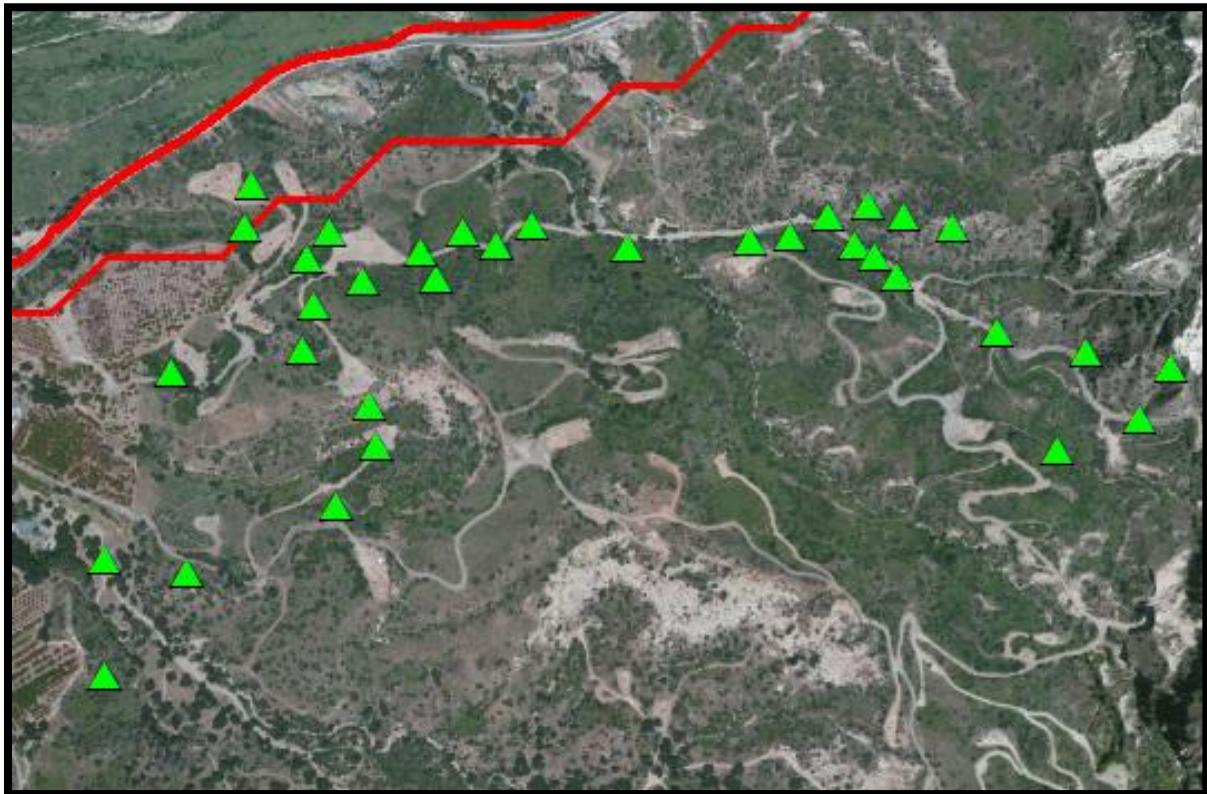


**Tuesday, May 3, 2022 – Cal NRG oil fields, including Richardson, Morgan, and Willard Canyons:**

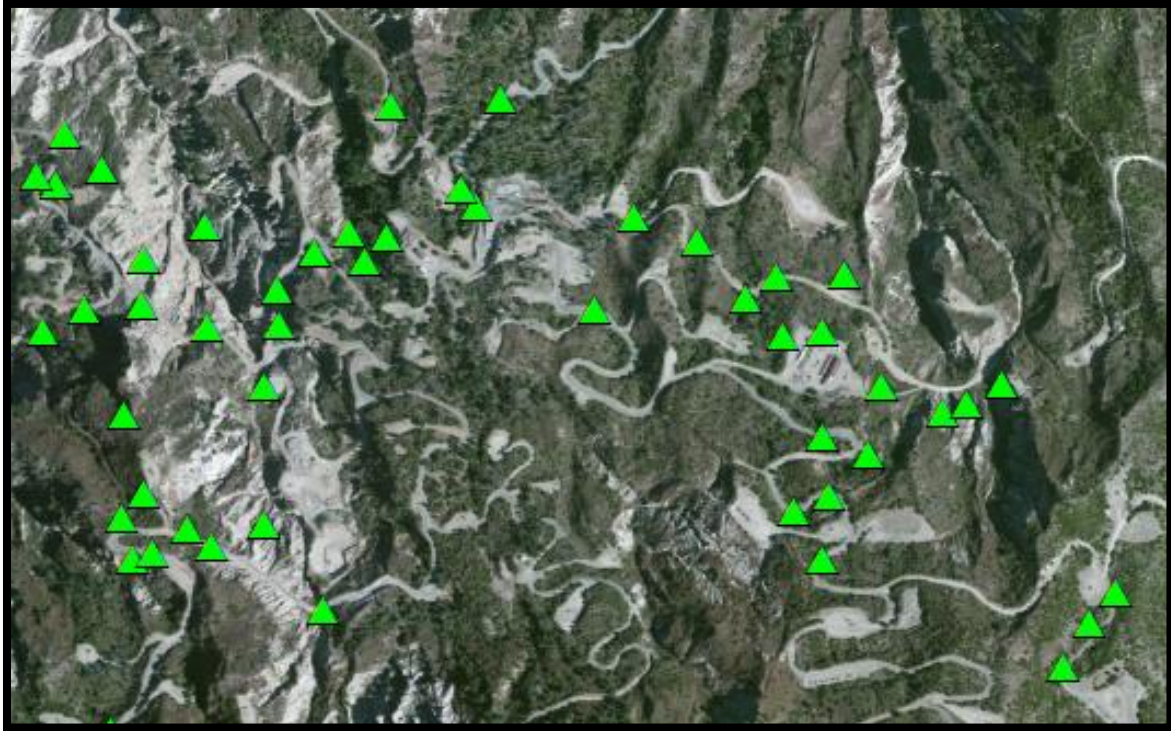
The field crew accessed the Phase 2 study area via the CA 118 freeway to CA 23 as it goes north and turns into Grimes Canyon Road, traversing the Santa Susana range from south to north. In the Santa Clara River Valley, the team turned west on Bardsdale Avenue briefly before turning south on South Sespe Street, and then west onto South Mountain Road. The crew followed the road until they reached a gate at the mouth of Richardson Canyon.

The team entered and drove up Richardson Canyon for a short distance before reaching a locked gate, where they turned around. The crew took another dirt road to the east into Morgan Canyon and traversed further east into Willard Canyon, checking stands along the way. The team navigated through a matrix of roads and oil derrick platforms when they reached a locked gate above Loftus Canyon. They then remotely observed stands of vegetation in Loftus Canyon, before descending back to the northwest down into Willard Canyon and out of the study area, ending the field effort for the day.

The image below shows green verification points in Richardson and Morgan Canyons. Oil derricks are seen as cleared pads without much vegetation on the imagery.



The image below shows green verification points in Willard Canyon and along the upper edge Loftus Canyon. White pads are oil derricks maintained by Cal NRG.



**Wednesday, May 4, 2022 – Cal NRG oil fields, including Richardson Canyon, South Mountain Lookout Road, 2019 fire zone:**

The field team accessed the oil fields on the north side of the mountain range through Richardson Canyon. They drove east through Morgan Canyon and as the team approached the western edge of Willard Canyon; they diverged to the south ascending the South Mountain ridgeline on South Mountain Lookout Road. The team traversed ridgeline to the west into the 2019 post-fire recovery zone. The crew observed post fire herbaceous stands on both sides of the ridgeline.

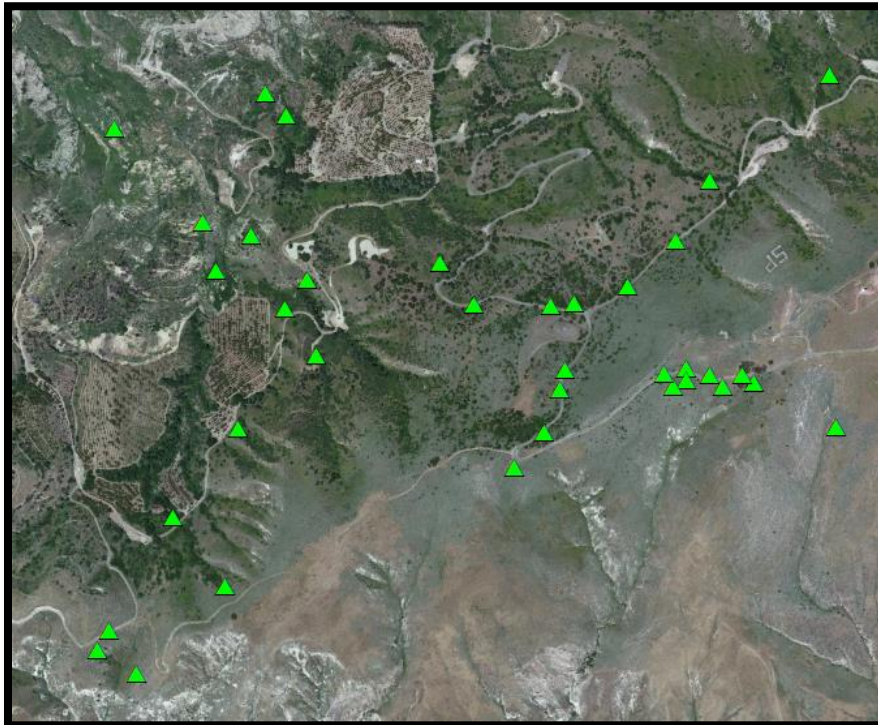
They followed South Mountain Lookout Road to the north, descending the north face into the hills southwest of Richardson Canyon. The team drove down to the lower third of the slope where they came to the edge of an avocado grove, turned around, and backtracked up the north face to the South Mountain ridgeline. The field crew turned north off the ridgeline and connected to a dirt road which descended into Willard Canyon. The team exited the northern edge of the Phase 2 study area and checked a few toe slope stands, before returning to the hotel for the evening.



The image below depicts green verification points recorded on the uppermost slopes of Willard Canyon and along the ridgeline on South Mountain Lookout Road.



The image below shows green verification points taken on the South Mountain ridgeline and viewed stands halfway down the north-facing slope in the hills to the southeast of Santa Paula.



### **Thursday, May 5, 2022 – Moorpark Urban and Simi Valley interface**

The field team accessed the Phase 2 study area via CA 118 freeway and Los Angeles Avenue. After viewing disturbed riparian and exotic stands draining into the Arroyo Las Posas wash, the team turned north onto Sand Canyon Road for a short distance to observe a disturbed riparian stand surrounded by land use and agriculture.

After returning to CA 118/Los Angeles Avenue, they briefly drove west before turning north on La Cumbre Road and followed it around until it met back up with Donlon Road and then CA 118. The team drove west on CA 118, shortly exiting the study area, before reentering again on Bradley Road. The field crew continued northeast along this road checking roadside polygons along the way.

Once reaching Balcom Canyon Road, the team turned north to view a “walnut draw” and the uppermost south-facing slopes with coastal sage scrub and grasslands. After reaching the uppermost ridgeline, the field crew drove back to the south until reaching CA 118, where they turned to the east. The team exited the highway on Collins Drive, connecting to Arroyo Drive south of the freeway. They followed Arroyo Drive to the east before pulling off and parking at Oak County Park.

The team hiked a trail leading to the east and eventually into Alamos Canyon drainage and protected canyons just south of the highway. The field crew returned to the car and proceeded to drive further east on CA 118 until turning north on N Madera Road. The team crossed under CA 118 where they turned southeast into a business complex and observed stands along the northern edge of the property. The team backtracked to CA 118 east and exited Erdinger Road, travelling north before turning east on Legacy Drive. After viewing some disturbed riparian and grassland types, the team transitioned through a residential development on Crosspointe Court and Silverstar Street, before turning to the northwest on Legends Drive and connecting to Lost Canyons Drive.

Driving north on Lost Canyons Drive the team stopped at Big Sky Park to evaluate the surrounding slopes for vegetation composition. The field crew returned to Lost Canyons Drive and continued east, then turned north on Tapo Canyon Road. They took Tapo Canyon Road until it reached the northern boundary of the Phase 1 study area, where the team then turned back to the south, exited the study area and completed the field verification for the week.

In the image below, the green triangles represent verification points within the Phase 2 project area boundary (depicted in red) taken along CA 118/Los Angeles Avenue and tributaries of the Arroyo Las Posas wash.

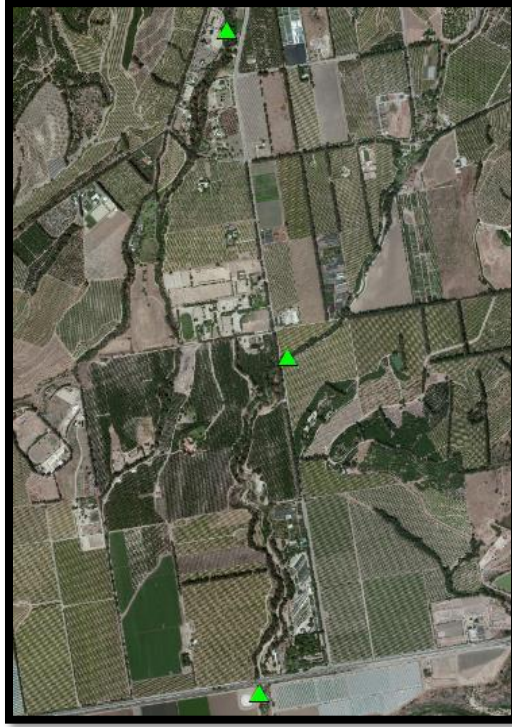


The screen shot below shows the verification points, displayed as green triangles, recorded along Bradley Road.





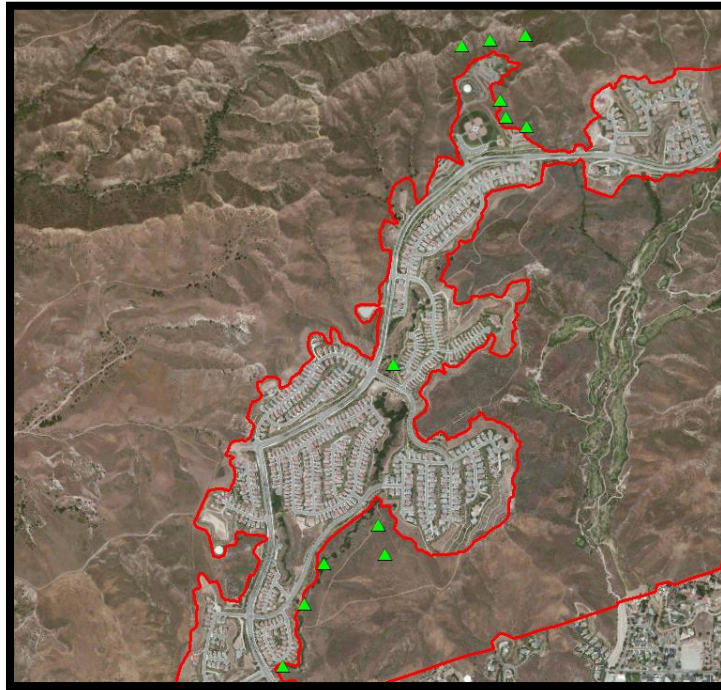
The image below depicts verification points along Balcom Canyon Road.



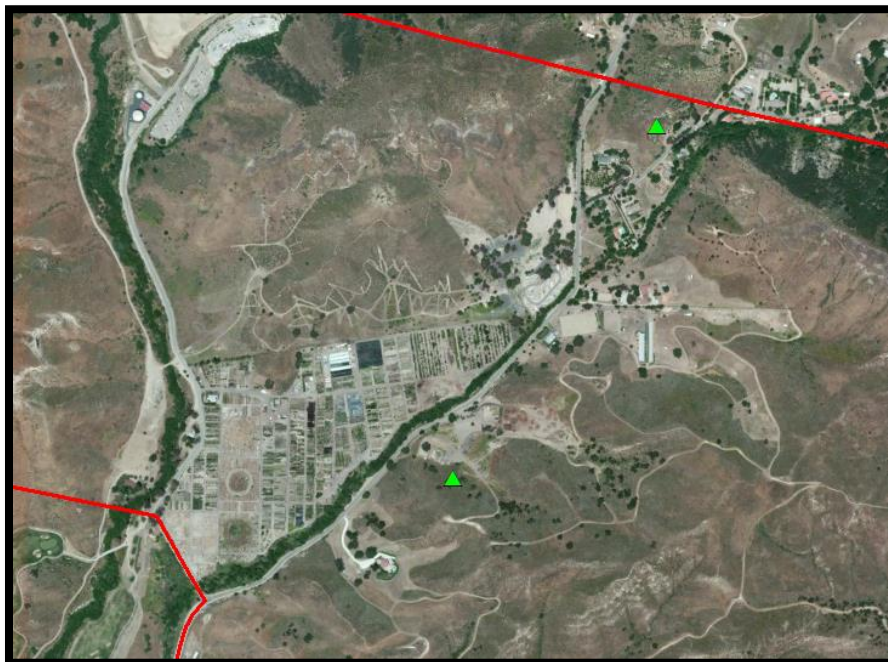
The image below shows the green reconnaissance points taken on hike from Oak Park into lower Alamos Canyon (within Phase 1 area).



The green verification points in the image below were taken along the Erringer Road and Legacy Drive, as well as in the hills surrounding Big Sky Park in Phase 1 project area.



The image below shows field points recorded along Tapo Canyon Road in the Phase 1 study area.





## The Vegetation

In contrast with the last field trip, which was conducted in September of 2021, where the vegetation had significantly died back with many of the trees and shrubs exhibiting drought deciduous conditions, the slightly below average precipitation in the winter of 2021-22 provided some relief and enhanced vitality to the vegetation during the mid-late spring field week. Many of the native and nonnative shrubs, herbs and forbs were blooming and in peak phenology at the time of this visit. The nonnative annual grasslands were still flush with green in the most protected aspects and slopes, with the more exposed annual grassland slopes turning to a yellow or tan color.

### **Moorpark Urban/Agricultural Interface Area, Las Posas, Arroyo Simi/Arroyo Las Posas**

The vegetation on the south side of the main ridgeline peaks, South Mountain (~2300ft) and Oak Ridge (~1900ft), interfaces with significant urban and agricultural encroachment. Most of the southerly slopes west of Coyote and Fox Canyons were burned in late October of 2019.

Nonnative trees such as *Eucalyptus* spp., *Robinia pseudoacacia*, *Schinus molle*, *Ailanthus altissima*, and many other planted and/or escaped exotics are common in this disturbance zone. Emergent stands of *Schinus molle* frequently occurred over drought stressed coastal sage scrub, with *Sambucus nigra*, *Artemisia californica*, *Opuntia littoralis*, and *Baccharis pilularis* as common understory components. Other exotics found in this portion include *Nicotiana glauca*, *Rhus lancea*, *Washingtonia* spp., and *Olea* spp.

Native plant stands primarily consist of oak woodlands and coastal sage scrub mixtures. *Quercus agrifolia* stands are limited to protected canyon bottoms and draws, with fragmented riparian components of *Platanus racemosa*, *Salix laevigata*, *Salix lasiolepis*, and *Baccharis salicifolia*. Along the toe slopes in the lower hills, small open stands of *Juglans californica* occurred over sparse to dense coastal sage scrub with a high cover of annual grasses.

*Artemisia californica* and *Salvia leucophylla* stands are most common in this area, with portions containing clusters of *Opuntia littoralis*. As one progresses west towards the coast, *Encelia californica* appears more frequently along directly south-facing slopes. More extensive stands of *E. californica* were seen on the uppermost neutral south-facing slopes just below the highest ridgelines. *Rhus integrifolia* stands also increase in frequency the closer in proximity they are to the coast. *Rhus ovata* and *Heteromeles arbutifolia* distributions were more restricted to cooler protected slopes, with the latter frequently congregating along *Q. agrifolia* margins. *Malacothamnus fasciculatum* patches were limited to low slope swales and coves, often intermingling with a variety of coastal sage species. *Hazardia squarrosa* also appeared as a component along disturbed grassland edges with *Artemisia californica*. Chaparral stands in this region are limited in size and distribution. *Adenostoma fasciculatum*, *Ceanothus megacarpus*, and *Quercus berberidifolia* typically occurred in fragmented patches with more dominant coastal sage scrub species.

Both planted native and nonnative embankments commonly buffered the edges of housing developments, golf courses, roads, and freeways. *Eriogonum fasciculatum*, *Artemisia californica*, *Acmispon glaber*, and *Salvia apiana* were the most common native species planted on roadside embankments.

Happy Camp Canyon wash was dominated by *Lepidospartum squamatum* with components of *Baccharis pilularis* and *Peritoma arborea*. Pockets of emergent *Sambucus nigra* and *Juglans californica* occurred on the slightly elevated margins of the terrace and floodplain. One stand near the entrance of Rustic Canyon Golf Course was revisited, where the team identified flowering *Encelia californica* and *Encelia farinosa*. During the previous trip in September of 2021, the plants on this slope were leafless and unrecognizable, giving a stark contrast of vitality. The north and east facing-slopes along the western edge of the Happy Camp drainage had a variety of shrubs mixed in the understory of *Quercus agrifolia* stands, such as *Rhus integrifolia*, *Rhamnus crocea*, and *Frangula californica*, along with localized patches of *Artemisia californica*, *Malacothamnus fasciculatus*, *Sambucus nigra*, and *Salvia apiana*.

The Arroyo Simi wash, running through the Moorpark area, is littered with large pockets of *Arundo donax*, along with many other exotics like *Eucalyptus* and *Schinus* species. Further west along the Arroyo Simi/Arroyo Las Posas drainage where it becomes less confined by culverts and man-made disturbances, the main channel contains core of *Salix laevigata*, *Salix lasiolepis* and *Baccharis salicifolia*. Many nonnatives such as *Eucalyptus* spp., *Schinus molle*, and *Arundo donax* form stands in the floodplain corridor and mix in varying degrees with the native riparian in the main channel and terrace margins. Small stands and/or inclusions of *Sambucus nigra* and *Juglans californica* were observed to occur along the terrace margins and in the adjacent tributaries leading into the main drainage stem.

### **Cal NRG Oil Fields, including Richardson, Morgan, Willard Canyons, and South Mountain Lookout Road**

Richardson, Morgan, and Willard Canyons are located on the north side of the Santa Susana Mountains, southeast of the town of Santa Paula. The mouth of Richardson canyon sits at about 300 feet in elevation and rises to ~2300' at the top of South Mountain. Most of the vegetation in Richardson and Morgan Canyons burned or partially burned in a 2019 fire.

The bottom of Richardson Canyon was comprised of partially burned *Quercus agrifolia*, with a variety of fire/disturbance following species in the understory such as, *Malosma laurina*, *Calystegia macrostegia*, *Acmispon glaber*, and *Marah macrocarpa*. Many of the trees exhibited partially burned crowns, with some resprouting occurring from damaged trunks and limbs. There were only a few instances where the trees were completely dead without any signs of post fire recovery.

Much of what the team observed in the 2019 fire zone from Morgan Canyon west were varying stages of successional shrubs and resprouting species. On more protected slopes out of the canyon bottoms, *Heteromeles arbutifolia* would cluster near the fringes

of oak stands with more *Rhus integrifolia* mixing on slightly higher or more exposed north slopes. Understory shrubs and herbaceous species include, *Leymus condensatus*, *Toxicodendron diversilobum*, *Acmispon glaber*, *Diplacus* spp., and *Calystegia macrostegia*. *Malosma laurina* was quick to resprout on the hotter, southerly aspects, and frequently was short in stature and mixed with a matrix of native and nonnative herbs and recovering coastal sage species. Burned *Juglans californica* stands were resprouting from the basal trunks and many exhibited a short stature. In a canyon just southwest of Richardson Canyon, the team observed a few stands of post fire recovering willow (both *Salix laevigata* and *Salix lasiolepis*) which had already resprouted into dense thickets.

The 2019 fire burned to the western edge of Willard Canyon. From the western ridgeline east, the canyons boasted mature *Quercus agrifolia* stands in canyon bottoms, swales, and toe slopes. *Malosma laurina* mixed into the *Q. agrifolia* understory from the drier aspects, whereas *Heteromeles arbutifolia* and *Rhus integrifolia* were interspersed in understory on deeper, cooler canyons and aspects. *Juglans californica* would blend into the *Quercus agrifolia* stands from the adjacent upslope edges of a draw or concavity. Extensive rock outcroppings occurred in this area containing a low cover of shrubs and herbs. These highly undulating, friable substrates had sparse patches of *Rhus integrifolia*, *Hazardia squarrosa*, *Atriplex lentiformis*, and *Eriogonum fasciculatum* where pockets of shallow soil would allow them to establish and colonize. *Rhus integrifolia* was commonly associated on the rocky fringes of these outcrops.

Oil derricks were prevalent on the north side of the mountains, which often had a small ring or band of exotic trees around the cement pads, with species including *Eucalyptus* spp., *Schinus molle*, and *Ailanthus altissima*. Small isolated patches of *Populus trichocarpa* were scattered near springs in a few draws and occasionally in one of the eroded escarpments. Much of the area between Willard and Loftus Canyons contains large stands of *Artemisia californica* and *Salvia leucophylla*, with a minor component of *Baccharis pilularis* in narrow draw bottoms. *Malosma laurina* stands were also prevalent in this area with very large stands on the undulating hills. *Leymus condensatus* was also a common occurrence on cooler draws and north-facing slopes.

Nonnative mustards dominated some of the flatter, deeper soil areas along the north side of the mountains surrounded by urban or agriculture. However, native herbaceous species such as *Deinandra fasciculata*, *Phacelia* spp., *Leymus condensatus*, *Corethrogyne filaginifolia*, *Eriophyllum confertiflorum*, and *Eucrypta chrysanthemifolia* frequently intermixed between the exotic mustards and bromes on the surrounding slopes above the urban/agricultural interface. The grasslands along the south side of the upper South Mountain ridgeline contained extensive portions of exotic mustards, thistles, and bromes, but were interspersed with native herbaceous species including *Phacelia* spp., *Eucrypta chrysanthemifolia*, *Leymus condensatus*, and *Helianthus annuus*.

### **Phase 1 Study Area: Alamos and Tapo Canyon**

In the lower portions of Alamos Canyon, the team observed a few protected north-facing slopes of dominant *Ceanothus megacarpus*. These stands also had inclusional components of *Quercus berberidifolia* and *Adenostoma fasciculatum*, with the former

occurring on neutral low slopes and the latter on rocky, exposed convexities and ridgetops. Much of the *C. megacarpus* looked stressed and decadent, with some of the most exposed aspects exhibiting complete die back. *Adenostoma fasciculatum* was resprouting (unsure if burn or human disturbance) in some of the surrounding areas and occurred with *Encelia californica*, *Eriogonum fasciculatum*, and *Salvia mellifera*. *Rhus integrifolia* stands occurred on rocky south faces, with a mixed coastal sage layer including *Artemisia californica*, *Eriogonum fasciculatum*, *Salvia leucophylla*, *Encelia californica*, *Acemisson glaber* and *Salvia mellifera*.

A confined drainage cutting through a housing development west of Dry Canyon had portions of dominant *Salix lasiolepis* under *Quercus agrifolia*. Upstream *Populus trichocarpa* and *Salix laevigata* mixed into portions of the drainage. The slopes surrounding Big Sky Park had a matrix of coastal sage scrub and chaparral. The rockiest upper slopes had scattered *Adenostoma fasciculatum* with a component of *Eriogonum fasciculatum* and *Yucca whipplei*, without much *Salvia mellifera*. Less exposed slopes with deeper soil on the lower half of the slope had more *Salvia mellifera* mixing into denser stands of *Adenostoma fasciculatum*. Other slopes were coastal sage scrub dominated where *Encelia californica* occupied neutral south-facing slopes with deeper soil. *Salvia mellifera* also blended into the edges of *E. californica* stands with *Malacothamnus fasciculatus*, *Salvia leucophylla* and *Artemisia californica*.

In Tapo Canyon, a small open stand of *Quercus lobata* was observed along a stream terrace, with the main channel dominated by *Salix laevigata*. As the team reached the northern boundary of Phase 1 mapping area, they viewed a mixed stand of *Ceanothus megacarpus* and *Adenostoma fasciculatum*, with matrix of *Encelia californica* and *Salvia mellifera* between the chaparral.

# **Appendix G**

**DRAFT**

## **Field key to the vegetation associations of the Santa Susana Mountains**



By

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Vegetation with an overstory of trees, which are typically at least 5 m tall. Absolute tree canopy cover is generally at least 10% or greater, but occasionally may be less than 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).

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Vegetation characterized by woody shrubs in the canopy, typically less than 5 m tall and usually multi-trunked/branched. Shrubs are usually at least 8% cover, but may be less, especially in more sparsely vegetated areas (Key C includes these cases). Tree species, if present, generally total < 8% absolute cover. Herbaceous species may total higher cover than shrubs. However, if total shrub cover is greater than total herb cover, it will be a shrub type unless total vegetation is < 9% absolute cover.

<a href="#">Key C. Herbaceous or Sparse Vegetation</a> .....	27
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Vegetation characterized by non-woody, herbaceous species in the canopy including grass, graminoid, and broad-leaved herbaceous species. Shrubs, if present, usually comprise < 9% absolute cover. Trees, if present, generally compose < 8% absolute cover. Also included within this key are sparsely vegetated situations, where total vegetation cover is < 9% total cover of plants and may be as low as 1% cover. Sparsely vegetated stands may be dominated by shrubs rather than herbs.

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Sites characterized by planted stands of vegetation, built-up sites, and/or other anthropogenic features. Unvegetated is defined as having zero cover or up to less than 1% absolute cover of vascular plant vegetation.

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## Introduction

This field key has been written to assist users in identifying the vegetation alliances and associations of the Santa Susana Mountains. The key is dichotomous and based on the classification of data collected by California Native Plant Society in 2018 and Rancho Santa Ana Botanic Garden staff in 2015, as well as additional supporting data, collected between 2003 and 2009, in the Santa Monica Mountains by National Park Service staff. Some vegetation types not identified from data collected in the Santa Susana Mtns. are included in this key because of their potential to occur in the area. Types not documented from within the project area are designated with an asterisk (\*).

While this key attempts to reflect the complexity of species interactions in the landscape, unusual or site-specific assemblages of plants may exist and may not be easily keyed. The key may not denote all vegetation types that occur in the study area, nor explain the full range of variation of vegetation types as they appear on the ground since it was based on the data available and the field surveys done at the time of the classification and mapping.

Alliances and associations are the primary units of vegetation identified in the key. The term “provisional” is used to indicate new types that are under-represented (i.e., <10 surveys) and would need additional sampling to describe fully. Some vegetation types are indicated at higher levels in the National Vegetation Classification hierarchy, including Group and Division. Mapping units are also included; these are landscape units to be mapped that are based more on substrate and landform characteristics than on classifiable vegetation.

While the key uses scientific plant and community names based on USDA Plants database nomenclature (USDA-NRCS 2019), alternate plant names based on the Jepson Manual (Baldwin et al. 2012, Jepson Flora Project 2019), are provided when discrepancies exist.

Thanks to the reviewer of the key, Raphaela Floreani Buzbee.

## Literature Cited

- Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, and T. J. Rosatti, eds. 2012. The Jepson Manual: Vascular Plants of California, Second Edition. University of California Press, Berkeley, CA. 1600 pp.
- Jepson Flora Project (eds.) 2019. Jepson eFlora, <http://ucjeps.berkeley.edu/eflora/> [accessed between 2018 and 2019].
- USDA-NRCS (2019). The PLANTS Database. National Plant Data Team, Greensboro, NC [<http://plants.usda.gov>, accessed 2018 to 2019].



## **Key A. Tree-Overstory Vegetation**

**1a.** The overstory is dominated by conifers alone or in co-dominance with broadleaf evergreen trees or shrubs. **(2)**

**1b.** Woodlands and forests characterized mainly by broad-leaved evergreen and deciduous tree species such as oaks (*Quercus* spp.), willows (*Salix* spp.), cottonwoods (*Populus* spp.). **(5)**

**2a.** A stand of pine or other conifer has been planted for landscaping purposes and is not naturally occurring.

### **Planted trees and shrubs Mapping Unit [93000]**

**2b.** Conifers are naturally occurring or are a restoration planting. **(3)**

**3a.** Bigcone Douglas-fir (*Pseudotsuga macrocarpa*) occurs as a dominant or co-dominant conifer in the overstory as a canopy tree, usually with at least 20% relative cover, and there may be an abundant (co-dominant or dominant) sub-canopy of oaks (*Quercus*). **(4)**

#### **Californian montane conifer forest & woodland Group (G344)**

##### ***Pseudotsuga macrocarpa* Alliance**

**3b.** Stand not as above. **(5)**

**4a.** Coast live oak occurs as a dominant or co-dominant sub-canopy tree to bigcone Douglas-fir and *Quercus chrysolepis* may be present at similar or less cover. Understory is variable in composition and often contains shrubs (e.g., *Heteromeles arbutifolia*, *Toxicodendron diversilobum*).

##### ***Pseudotsuga macrocarpa* – *Quercus agrifolia* Association**

**4b.** Canyon live oak occurs as a dominant sub-canopy tree and sometimes as an understory shrub and is co-dominant or sub-dominant to bigcone Douglas-fir. Not sampled within the project area but may occur there.

##### ***Pseudotsuga macrocarpa* – *Quercus chrysolepis* Association\***

**5a.** Woodlands characterized by riparian habitat. Trees are mostly deciduous, though *Quercus agrifolia* may also be dominant. **(6)**

**5b.** Oaks, walnut (*Juglans californica*), or other broadleaf trees dominate in an upland setting **(14)**

**6a.** *Salix laevigata* is the sole dominant in the tree canopy. *Salix lasiolepis* may be present in the shrub layer. While not sampled within the project area, this alliance has been sampled nearby. **(7)**

#### **Western Interior Riparian Forest & Woodland Group (G797)**

##### ***Salix laevigata* Alliance\***

**6b.** Stand not as above. **(8)**

**7a.** *Salix lasiolepis* and/or *Baccharis salicifolia* dominate or co-dominate in the shrub layer sharing the stand with *Salix laevigata*.

***Salix laevigata* / *Salix lasiolepis* Association\***

**7b.** *Salix laevigata* strongly dominates the canopy. Other trees and shrubs, including *Salix lasiolepis* or *Baccharis salicifolia*, may be present but at much less cover than red willow.

***Salix laevigata* Association\***

**8a.** *Populus fremontii*, *Platanus racemosa*, and/or *Quercus agrifolia* dominate or co-dominate the tree canopy. *Salix lasiolepis* or other riparian shrubs may occur at greater cover in the shrub layer. **(9)**

**Western Interior Riparian Forest & Woodland Group (G797)**

**8b.** Stand not as above, OR California walnut and coast live oak share the canopy. **(14)**

**9a.** *Platanus racemosa*, and/or *Quercus agrifolia* dominate or co-dominate the tree canopy. **(10)**

***Platanus racemosa* – *Quercus agrifolia* Alliance**

**9b.** A *Populus* species dominates or co-dominates the tree canopy, including with *Salix* spp. **(12)**

**10a.** *Quercus agrifolia* is dominant in the tree canopy, without much *Platanus*. *Salix lasiolepis* and/or other riparian shrubs are in the understory.

***Quercus agrifolia* / *Salix lasiolepis* Association**

**10b.** *Platanus racemosa* has a significant presence in the stand. **(11)**

**11a.** *Platanus racemosa* is dominant in the tree canopy, without any *Quercus agrifolia*. The shrubby understory consists of riparian shrubs, with *Toxicodendron* usually high in cover.

***Platanus racemosa* / *Toxicodendron diversilobum* Association\***

**11b.** *Platanus racemosa* and *Quercus agrifolia* co-dominate, OR one of these species dominates the tree canopy, and the other is subdominant. There is a significant riparian shrub understory that is often dominated by *Salix lasiolepis*. Other trees such as California walnut and red willow may be present as well.

***Platanus racemosa* – *Quercus agrifolia* Association**

**12a.** *Populus trichocarpa* (= *P. balsamifera* ssp. *trichocarpa*) is dominant or co-dominant with willows.

***Populus trichocarpa* Alliance\***

**12b.** *Populus fremontii* is dominant or co-dominant with willow. **(13)**

***Populus fremontii* – *Fraxinus velutina* – *Salix gooddingii* Alliance\***



**13a.** *Salix lasiolepis* is the dominant or co-dominant with other shrubs such as *Baccharis salicifolia* in the subcanopy to understory.

***Populus fremontii* – *Salix laevigata* Association\***

**13b.** *Salix laevigata* is subdominant to co-dominant with *Populus fremontii* and the subcanopy may be variable with other species including *S. lasiolepis*.

***Populus fremontii* – *Salix laevigata* Association\***

**14a.** *Juglans californica* and *Quercus agrifolia* are both present in the tree canopy at 1% or more absolute cover. One or the other tree may be dominant, and no other tree species is dominant. Shrub understory may be open to intermittent. If *Quercus* is low in cover and not co-dominant, review other associations in the alliance below for a better fit.

**Californian Broadleaf Forest & Woodland Group (G195)**

***Juglans californica* Alliance**

***Juglans californica* – *Quercus agrifolia* Association**

**14b.** Stand not as above. **(15)**

**15a.** *Quercus agrifolia* is dominant to co-dominant in the tree canopy in upland stands. **(16)**

**Californian Broadleaf Forest & Woodland Group (G195)**

***Quercus agrifolia* Alliance**

**15b.** Stand not as above. *Juglans californica* or other tree dominant. (If *Platanus*, *Juglans*, or *Salix* is present with *Quercus agrifolia*, review key steps 8 to 14.) **(20)**

**16a.** *Umbellularia californica* co-dominates with coast live oak.

***Quercus agrifolia* – *Umbellularia californica* Association\***

**16b.** Coast live oak is usually the sole dominant tree species in the overstory in upland settings over a variety of understory layers from grassy to scrubby. **(17)**

**17a.** While the overstory is dominated solely by coast live oak, the shrub understory is sparse to low in cover.

***Quercus agrifolia* Association**

**17b.** The shrub understory has significant cover. **(18)**

**18a.** Coastal scrub species like California sagebrush and purple sage characterize the shrub layer.

***Quercus agrifolia* / *Salvia leucophylla* – *Artemisia californica* Association\***

**18b.** Other shrubs characterize the understory. **(19)**

**19a.** A ceanothus species occurs as a tall understory shrub associated with an open to intermittent canopy of coast live oak.

***Quercus agrifolia* / *Ceanothus (oliganthus, spinosus)* Association\***

**19b.** While the overstory is dominated solely by coast live oak, the understory is dominated or characterized by toyon (*Heteromeles arbutifolia*). Laurel sumac, poison oak, and other shrubs may be present at similar cover.

***Quercus agrifolia* / *Heteromeles arbutifolia* Association\***

**20a.** *Juglans californica* is dominant in the tree canopy or co-dominates with *Fraxinus dipetala*, *Schinus molle*, or other tree. If sycamore or coast live oak are present, they are not co-dominant with walnut. **(21)**

**Californian Broadleaf Forest & Woodland Group (G195)**  
***Juglans californica* Alliance**

**20b.** Stand not as above. **(24)**

**21a.** A shrub understory is sparse or lacking and annual grasses and herbs dominate the understory.

***Juglans californica* / annual herbaceous Association**

**21b.** Shrubs form an understory below the canopy of California walnut. **(22)**

**22a.** California sagebrush is codominant to dominant often with purple sage in the shrub understory. Giant wild rye is usually present in significant cover in the herb layer. California walnut is dominant in the overstory.

***Juglans californica* / *Artemisia californica* / *Leymus condensatus* Association**

**22b.** Different shrubs dominate the understory. **(23)**

**23a.** *Malosma laurina* is a significant part of the shrub understory with other shrubs (some often early seral such as *Malacothamnus fasciculatus*) often present at low cover.

***Juglans californica* / *Malosma laurina* Association**

**23b.** *Heteromeles arbutifolia* is present at greater than 5% absolute cover and dominates the understory. Sugar bush and several other typically chaparral shrubs are usually present along with toyon in the shrub layer. Though not sampled within the project area, this type was found nearby.

***Juglans californica* / *Heteromeles arbutifolia* Association\***

**24a.** *Quercus lobata* dominates or co-dominates with *Quercus agrifolia* in the tree canopy. Shrubs have at most half the cover of the tree canopy.

**Californian Broadleaf Forest & Woodland (G195)**  
***Quercus lobata* Alliance**  
***Quercus lobata* – *Quercus agrifolia* / grass Association**

**24b.** Oaks do not dominate the canopy. **(25)**

**25a.** *Umbellularia californica* dominates the tree canopy. The understory is dominated by *Ceanothus oliganthus*. This type was not sampled in the study area, but found nearby.

***Umbellularia californica* Alliance\***  
***Umbellularia californica* / *Ceanothus oliganthus* Association\***

**25b.** Non-native trees dominate the overstory. **(26)**

**Californian Ruderal Forest Group (G678)**

**26a.** *Schinus molle* has naturalized, expanding beyond an original planting, and dominates the stand.

***Schinus molle* – *Schinus terebinthifolius* – *Myoporum laetum* Semi-natural Alliance\***  
***Schinus molle* Semi-natural Association\***

**26b.** Other trees are the dominant tree in the canopy. **(27)**

**27a.** *Eucalyptus* spp. are naturalized, expanding beyond an original planting, and dominate the stand.

***Eucalyptus* spp. – *Ailanthus altissima* – *Robinia pseudoacacia* Semi-natural Alliance\***  
***Eucalyptus (globulus, camaldulensis)* Semi-natural Association\***

**27b.** *Eucalyptus* spp. or other planted trees are the dominant tree in the canopy, and have not expanded beyond the original planting.

**Planted trees and shrubs Mapping Unit**

## Key B. Shrub-Overstory Vegetation

**1a.** Shrublands dominated or co-dominated by sclerophyllous temperate broad-leaved shrubs (with leaves hardened by a waxy cuticle). Stands dominated by typical chaparral shrub genera; including chamise (*Adenostoma fasciculatum*), manzanita (*Arctostaphylos* spp.), *Ceanothus* spp., mountain-mahogany (*Cercocarpus montanus* [= *C. betuloides*]), toyon (*Heteromeles arbutifolia*), *Malosma laurina*, *Rhus* spp., holly-leaf cherry (*Prunus ilicifolia*) and *Quercus berberidifolia* **(2)**

**1b.** Shrublands 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. Microphyllous evergreen shrubs such as coyotebrush (*Baccharis pilularis*), *Isocoma menziesii*, and sawtooth goldenbush (*Hazardia squarrosa*) are generally considered to be part of coastal sage scrub or seral scrub, and are also included. Chaparral species may be present but not dominant. Includes shrub willow (*Salix* spp.), mule-fat (*Baccharis salicifolia*), quailbush (*Atriplex lentiformis*), arrowweed (*Pluchea sericea*), buckwheat (*Eriogonum* spp.), yerba santa (*Eriodictyon* spp.), California sagebrush (*Artemisia californica*), sage (*Salvia* spp.), poison oak (*Toxicodendron diversilobum*), bush lupine (*Lupinus* spp.), *Lycium californicum*, and bush monkeyflower (*Diplacus aurantiacus*). **(39)**

**2a.** *Prunus ilicifolia* is dominant or co-dominates with other shrubs. **(3)**

**Californian Mesic & Pre-montane Chaparral Group (G261)**

***Prunus ilicifolia* – *Heteromeles arbutifolia* – *Ceanothus spinosus* Alliance**

**2b.** Other shrubs are dominant, and *Prunus ilicifolia* is not co-dominant. **(4)**

**3a.** *Prunus ilicifolia* is strongly dominant.

***Prunus ilicifolia* ssp. *ilicifolia* Association**

**3b.** *Prunus ilicifolia* shares the canopy with other shrubs. Toyon occurs as a sub-dominant to co-dominant. Other shrubs may also be co-dominant.

***Prunus ilicifolia* ssp. *ilicifolia* – *Heteromeles arbutifolia* Association\***

**4a.** *Heteromeles arbutifolia* and/or *Fraxinus dipetala* is dominant or co-dominant with *Artemisia californica*, or *Malosma laurina*. **(5)**

**Californian Mesic & Pre-montane Chaparral Group (G261)**

***Prunus ilicifolia* – *Heteromeles arbutifolia* – *Ceanothus spinosus* Alliance**

**4b.** Stand not as above. If toyon is co-dominant with *Rhus integrifolia* (and *Artemisia californica* is NOT co-dominant) go to key step 18. **(7)**

**5a.** *Fraxinus dipetala* is dominant or co-dominant in the stand, and *Heteromeles arbutifolia* is also present to co-dominant.

***Heteromeles arbutifolia* – *Fraxinus dipetala* Association (Provisional)**

**5b.** *Fraxinus dipetala* does not characterize the stand, though it may be present at low cover. **(6)**

**6a.** *Heteromeles arbutifolia* occurs with *Artemisia californica*, which may be sub-dominant to co-dominant.

***Heteromeles arbutifolia* – *Artemisia californica* Association\***

**6b.** *Heteromeles arbutifolia* strongly dominates the stand, with the highest absolute cover of any shrub, and *Artemisia californica* is a minor component, less than 10% relative cover.

***Heteromeles arbutifolia* Association**

**7a.** *Cercocarpus betuloides* or *Quercus berberidifolia* is dominant or co-dominant with chamise. **(8)**

**Californian Mesic & Pre-montane Chaparral Group (G261)**

**7b.** Other shrubs are dominant or co-dominant. **(9)**

**8a.** *Cercocarpus montanus* [= *C. betuloides*] is dominant or co-dominant with chamise.

***Cercocarpus montanus* var. *glaber* Alliance**

***Cercocarpus montanus* var. *glaber* Association OR**

***Cercocarpus montanus* – *Adenostoma fasciculatum* Association\***

**8b** *Quercus berberidifolia* is dominant or co-dominant with chamise.

***Quercus berberidifolia* Alliance\***

***Quercus berberidifolia* Association\* OR**

***Quercus berberidifolia* – *Adenostoma fasciculatum* Association\***

**9a.** *Arctostaphylos glandulosa* is dominant to co-dominant with *Adenostoma fasciculatum*, with manzanita at least 30% relative cover or the highest cover species in the shrub layer.

**Californian Mesic & Pre-montane Chaparral Group (G261)**

***Arctostaphylos glandulosa* Alliance\***

***Arctostaphylos glandulosa* – *Adenostoma fasciculatum* Association\***

**9b.** Another shrub dominates or co-dominates the stand. *Arctostaphylos*, if present, is less than 30% relative cover **(10)**.

**10a.** The stand is dominated or co-dominated by a species of *Ceanothus* **(11)**

**10b.** Another shrub dominates or co-dominates the stand. **(18)**

**11a.** *Ceanothus oliganthus* or *Ceanothus leucodermis* occurs as a dominant or co-dominates with chamise, typically in higher elevations or moister, cooler conditions. **(12)**

**Californian Mesic & Pre-montane Chaparral Group (G261)**

***Ceanothus oliganthus* – *Ceanothus leucodermis* – *Ceanothus tomentosus* Alliance**



**11b.** *Ceanothus megacarpus* or *C. crassifolius* dominates or co-dominates the stand, typically in more xeric conditions. **(13)**

**Californian Xeric Chaparral Group (G257)**

**12a.** Hairy leaf ceanothus is the dominant shrub. No other species provides high cover in the shrub layer.

***Ceanothus oliganthus* Association**

**12b.** Hairy leaf ceanothus co-dominates with chamise and other chaparral shrubs may have significant cover.

***Ceanothus oliganthus* – *Adenostoma fasciculatum* Association\***

**13a.** *Ceanothus megacarpus* occurs as a dominant or co-dominates with *Salvia mellifera*, while neither *Artemisia californica* nor *Eriogonum cinereum* have higher cover than *Ceanothus*. **(14)**

***Ceanothus megacarpus* Alliance**

**13b.** Another species of *Ceanothus* dominates or co-dominates in stands. **(15)**

**14a.** *Ceanothus megacarpus* co-dominates with *Salvia mellifera*.

***Ceanothus megacarpus* – *Salvia mellifera* Association\***

**14b.** *Ceanothus megacarpus* is strongly dominant.

***Ceanothus megacarpus* Association**

**15a.** *Ceanothus crassifolius* occurs as a dominant or co-dominates with other chaparral shrubs. **(16)**

***Ceanothus crassifolius* Alliance**

**15b.** Stands not as above. **(18)**

**16a.** Hoary leaf ceanothus occurs as the sole dominant species, and other chaparral shrubs, if present, are relatively low in cover.

***Ceanothus crassifolius* Association\***

**16b.** Hoary leaf ceanothus co-dominates with one or more other shrubs **(17)**

**17a.** Hoary leaf ceanothus co-dominates with chamise.

***Ceanothus crassifolius* – *Adenostoma fasciculatum* Association**

**17b.** Hoary leaf ceanothus co-dominates with mountain mahogany

***Ceanothus crassifolius* – *Cercocarpus montanus* Association\***

**18a.** *Rhus integrifolia* is dominant or co-dominant with *Artemisia californica*, *Eriogonum cinereum*, *Heteromeles arbutifolia*, *Malosma laurina*, or *Salvia mellifera*. **(19)**

**Californian Maritime Chaparral Group (G258)**

***Rhus integrifolia* Alliance\***

**18b.** *Rhus integrifolia* is not dominant. It may be co-dominant with *Encelia californica*, *Opuntia* spp., *Salvia leucophylla*, or some other shrub. **(23)**

**19a.** *Rhus integrifolia* is strongly dominant with a significantly lower cover of other shrubs.

***Rhus integrifolia* Association\***

**19b.** Stand not as above. **(20)**

**20a.** *Rhus integrifolia* is co-dominant with *Malosma laurina*.

***Rhus integrifolia* – *Malosma laurina* Association\***

**20b.** Stand not as above. **(21)**

**21a.** *Rhus integrifolia* is co-dominant with either *Salvia mellifera* and/or *Artemisia californica*.

***Rhus integrifolia* – *Artemisia californica* – *Salvia mellifera* Association\***

**21b.** Stand not as above. **(22)**

**22a.** *Rhus integrifolia* is dominant or co-dominant with coastal sage scrub species. Either *Eriogonum cinereum*, *Encelia californica*, or *Salvia leucophylla* are diagnostically present. *Artemisia californica* is also usually present.

***Rhus integrifolia* – *Artemisia californica* – *Eriogonum cinereum* Association**

**22b.** *Rhus integrifolia* is dominant or co-dominant with chaparral shrubs and toyon is co-dominant or sub-dominant. One or more of the following species are also commonly present, *Cercocarpus*, *Malosma*, *Toxicodendron*, and *Artemisia californica*.

***Rhus integrifolia* – *Heteromeles arbutifolia* Association\***

**23a.** *Malosma laurina* is dominant or co-dominant in the shrub layer. Coastal scrub species such as *Rhus ovata* and *Salvia mellifera* may be co-dominants. **(24)**

**Californian Maritime Chaparral Group (G258)**

***Malosma laurina* Alliance**

**23b.** Another species has more cover than *Malosma laurina*, OR the co-dominant is *Encelia californica* or another chaparral shrub such as chamise. **(29)**

**24a.** *Malosma laurina* is co-dominant with *Rhus ovata*. *Salvia mellifera* may also be co-dominant or sub-dominant.

***Malosma laurina* – *Rhus ovata* Association\***

**24b.** *Rhus ovata* is not co-dominant. **(25)**

**25a.** *Malosma laurina* and *Salvia leucophylla* are co-dominant. *Artemisia californica* is present as a subdominant along with other coastal scrub species.

***Malosma laurina* – *Artemisia californica* – *Salvia leucophylla* Association\***

**25b.** *Salvia leucophylla* is not co-dominant. **(26)**

**26a.** *Malosma laurina* is dominant to co-dominant with *Artemisia californica* and/or *Eriogonum fasciculatum*. Buckwheat and/or sagebrush may also be sub-dominant.

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

**26b.** Stand not as above. **(27)**

**27a.** *Malosma laurina* is strongly dominant, greater than 60% relative cover of the shrub layer.

***Malosma laurina* Association\***

**27b.** Stand not as above. **(28)**

**28a.** *Salvia mellifera* is co-dominant to sub-dominant with *Malosma laurina*. If *Salvia mellifera* is co-dominant, *Artemisia californica* is not present. *Malosma laurina* is less than 60% relative cover of the shrub layer. Other coastal scrub species, including *Malacothamnus fasciculatus*, may have greater cover than *Salvia mellifera*.

***Malosma laurina* – *Salvia mellifera* Association**

**28.** *Salvia mellifera* is co-dominant and *Artemisia californica* is present. **(54)**

**29a.** *Rhus ovata* is dominant or co-dominant with *Artemisia californica* or *Salvia leucophylla*. **(30)**

**Western Madrean Chaparral Group (G281)  
*Rhus ovata* Alliance**

**29b.** *Rhus ovata* is not dominant, or is co-dominant with *Adenostoma fasciculatum*. **(31)**

**30a.** *Rhus ovata* is co-dominant with *Artemisia californica* and/or *Salvia leucophylla*.

***Rhus ovata* – *Salvia leucophylla* – *Artemisia californica* Association**

**30b.** *Rhus ovata* is dominant.

***Rhus ovata* Association**

**31a.** *Adenostoma fasciculatum* is dominant or co-dominant in stands that include various shrubs such as laurel sumac or sage. **(32)**

**Californian Xeric Chaparral Group (G257)**

**31b.** Chamise is NOT co-dominant, or is co-dominant with *Fraxinus dipetala*. **(39)**

**32a.** *Adenostoma fasciculatum* is co-dominant with *Salvia mellifera*, OR *Salvia mellifera* is the shrub next highest in cover and is not followed by *Artemisia californica*, *Eriogonum fasciculatum*, or *Malosma laurina*.

***Adenostoma fasciculatum* – *Salvia* spp. Alliance**  
***Adenostoma fasciculatum* – *Salvia mellifera* Association**

**32b.** *Salvia mellifera* is not co-dominant or other coastal scrub species are of similar importance. **(33)**

***Adenostoma fasciculatum* Alliance**

**33a.** *Adenostoma fasciculatum* is dominant or co-dominant with disturbance indicators including *Eriodictyon crassifolium*, *Lotus scoparius* [= *Acmispon glaber*], *Malacothamnus fasciculatus*, *Dendromecon rigida*, or *Helianthemum scoparium*. Stands may be post-burn, with low overall cover and fire-following herbs.

***Adenostoma fasciculatum* – (*Lotus scoparius* – *Eriodictyon* spp.) Association\***

**33b.** Stand not as above. **(34)**

**34a.** *Adenostoma fasciculatum* is co-dominant with more than one species. The co-dominant species do not include the disturbance indicators listed in the previous key step. At least one of the co-dominants is *Artemisia californica*, *Eriogonum fasciculatum*, *Malosma laurina*, or *Salvia mellifera*.

***Adenostoma fasciculatum* – (*Eriogonum fasciculatum* – *Salvia mellifera*)\* Association**

**34b.** Stand not as above. **(35)**

**35a.** *Adenostoma fasciculatum* is co-dominant with *Diplacus aurantiacus*. *Rhus ovata* may also co-dominate.

***Adenostoma fasciculatum* – *Diplacus aurantiacus* Association\***

**35b.** Stand not as above. **(36)**

**36a.** *Adenostoma fasciculatum* is co-dominant with *Malosma laurina*. Neither *Eriogonum fasciculatum* or *Salvia mellifera* are next highest in cover.

***Adenostoma fasciculatum* – *Malosma laurina* Association\***

**36b.** Stand not as above. **(37)**

**37a.** *Eriogonum fasciculatum* is co-dominant to sub-dominant with chamise. If *Eriogonum* is sub-dominant, chaparral shrub species have similar or more cover than buckwheat AND more cover than *Salvia mellifera* and/or *Malosma laurina*, if present.

***Adenostoma fasciculatum* – *Eriogonum fasciculatum* Association**

**37b.** Stand not as above. **(38)**

**38a.** *Adenostoma fasciculatum* is dominant to co-dominant with at least two of the following species being sub-dominants (to co-dominant), *Artemisia californica*, *Eriogonum fasciculatum*, *Malosma laurina*, *Salvia leucophylla*, or *Salvia mellifera*.

***Adenostoma fasciculatum* – (*Eriogonum fasciculatum* – *Salvia mellifera*) Association\***

**38b.** *Adenostoma fasciculatum* is strongly dominant.

***Adenostoma fasciculatum* Association**

**39a.** *Fraxinus dipetala* has the highest cover in the overstory or is co-dominant with *Heteromeles arbutifolia*.

**Californian Mesic & Pre-montane Chaparral Group (G261)**

***Prunus ilicifolia* – *Heteromeles arbutifolia* – *Ceanothus spinosus* Alliance**

***Heteromeles arbutifolia* – *Fraxinus dipetala* Association (Provisional)**

**39b.** *Fraxinus dipetala* is less than 30% relative cover in the shrub canopy. Other shrubs are present and dominant, including coastal scrub, bluff scrub, and seral scrub species. (If a tree species such as *Juglans californica* has 10% absolute cover or more, see key B.) **(40)**

**40a.** Shrublands characterized by the presence of *Lepidospartum squamatum* where *L. squamatum* is dominant, co-dominant, or characteristically present with other shrubs. Stands are generally found in rocky, flooded washes or alluvial plains, and shrubs vary from 1 to over 30% absolute cover. **(41)**

**Warm Semi-Desert Shrub & Herb Dry Wash & Colluvial Slope Group (G541)**

***Lepidospartum squamatum* Alliance**

**40b.** Stands not as above. If *Lepidospartum squamatum* is present, it is less than 1% absolute cover and less than 10% relative cover in the shrub layer. **(43)**

**41a.** *Lepidospartum squamatum* is present, at 1% absolute cover or more, with *Baccharis salicifolia*.

***Lepidospartum squamatum* – *Baccharis salicifolia* Association\***

**41b.** Stand not as above. **(42)**

**42a.** *Lepidospartum squamatum* is present, at 1% absolute cover or more, with *Eriogonum fasciculatum*.

***Lepidospartum squamatum* – *Eriogonum fasciculatum* Association**

**42b.** *Lepidospartum squamatum*, at 1% absolute cover or more, is the dominant shrub over an understory of annual herbaceous species. The herb layer may be much higher in cover than the shrub layer.

***Lepidospartum squamatum* / ephemeral annuals Association**



**43a.** Riparian or moist shrubs are dominant or co-dominant including *Baccharis salicifolia*, *Salix*, *Pluchea sericea*, *Tamarix* spp., etc. **(44)**

**43b.** Upland scrubs or shrubs are dominant or co-dominant including *Artemisia californica*, *Eriogonum*, *Salvia*, *Opuntia*, etc. **(53)**

**44a.** *Baccharis salicifolia* is dominant in the shrub canopy, or co-dominant with other shrubs except *Salix* spp. An emergent and sparse tree layer of *Salix* spp. or other species may also be present.

**North American Warm Desert Riparian Low Bosque & Shrubland Group (G533)**  
***Baccharis salicifolia* Alliance**  
***Baccharis salicifolia* Association**

**44b.** *Baccharis salicifolia* cover is insignificant or it co-dominates with *Salix* spp. **(45)**

**45a.** *Salix lasiolepis* or *Salix exigua* is dominant or co-dominant. It may be accompanied by mulefat (*Baccharis salicifolia*) or other riparian and/or coastal shrubs. **(46)**

**45b.** If *Salix lasiolepis* or *S. exigua* is present, it is not an important part of the canopy. Other shrubs dominant or co-dominant. **(49)**

**46a.** *Salix lasiolepis* is dominant or co-dominant. **(47)**

***Salix lasiolepis* Alliance**

**46b.** *Salix exigua* is dominant or co-dominant. **(48)**

***Salix exigua* Alliance\***

**47a.** *Baccharis salicifolia* is a characteristic sub-dominant or co-dominant with *Salix lasiolepis*.

***Salix lasiolepis* – *Baccharis salicifolia* Association\***

**47b.** *Salix lasiolepis* is the sole dominant in the stand.

***Salix lasiolepis* Association**

**48a.** *Arundo donax* is a characteristic sub-dominant or co-dominant with *Salix exigua*.

***Salix exigua* – *Arundo donax* Association\***

**48b.** *Salix exigua* is the sole dominant in the stand.

***Salix exigua* Association\***

**49a.** *Sambucus nigra* is dominant in the shrub canopy.

***Sambucus nigra* Alliance**  
***Sambucus nigra* Association**

**49b.** *Sambucus nigra* is NOT dominant. **(50)**

**50a.** Other riparian native shrubs dominant, namely *Pluchea sericea* or *Atriplex lentiformis*. **(51)**  
**North American Desert Alkaline-Saline Wet Scrub Group (G537)**

**50b.** Other non-native riparian shrubs dominant, including *Nicotiana* or *Tamarix* strongly dominant (>66%) **(52)**  
**Interior West Ruderal Riparian Forest & Scrub Group (G510)**

**51a.** *Pluchea sericea* is dominant or sometimes co-dominant with others in the shrub canopy.  
***Pluchea sericea* Alliance\***  
***Pluchea sericea* Association\***

**51b.** *Atriplex lentiformis* is dominant in the shrub canopy.  
***Atriplex lentiformis* Alliance\***  
***Atriplex lentiformis* Association\***

**52a.** *Tamarix* spp. dominant in the shrub canopy.  
***Tamarix* spp. Semi-natural Alliance\***  
***Tamarix* spp. Association\***

**52b.** *Nicotiana glauca* dominant in the shrub canopy.  
**Interior West Ruderal Riparian Forest & Scrub Group (G510)**  
*Nicotiana glauca* Semi-natural Stands (no current alliance defined)\*

**53a.** The overstory is characterized by cactus. Cactus is more than 30% relative cover in the shrub layer, or may be as low as 20% relative cover if the absolute cover is more than one-third that of the dominant coastal scrub species. **(54)**  
**Baja Semi-Desert Coastal Succulent Scrub Group (G298)**  
***Opuntia littoralis* – *Opuntia oricola* – *Cylindropuntia prolifera* Alliance\***

**53b.** Cactus may occur but is less than 20% relative cover. **(56)**  
**54a.** *Cylindropuntia prolifera* is the dominant shrub or has the highest cover.  
***Cylindropuntia prolifera* – Mixed Coastal Scrub Association\***  
**(Provisional)**

**54b.** Another *Opuntia* is present as a co-dominant **(55)**

**55a.** *Opuntia littoralis* is present and co-dominant with either *Artemisia californica* or *Eriogonum fasciculatum*, and these 3 species have the highest cover in the shrub layer.  
***Opuntia littoralis* Association**

**55b.** *Opuntia oricola* is the co-dominant cactus or has the highest cover.  
***Opuntia oricola* Association (Provisional)\***

**56a.** *Salvia mellifera* is dominant or co-dominates with something other than *Encelia californica*. *Artemisia californica* is often present. **(58)**

**Central & Southern Californian Coastal Sage Scrub Group (G264)**  
***Salvia mellifera* – *Artemisia californica* Alliance**

**56b.** *Salvia mellifera* is NOT dominant, OR co-dominates with *Encelia californica*, OR co-dominates with both *Artemisia californica* and *Eriogonum fasciculatum*. **(64)**

**58a.** *Salvia mellifera* is co-dominant with *Eriogonum cinereum*. *Eriogonum cinereum* may also be sub-dominant, but will be the species with the next highest cover.

***Salvia mellifera* – *Eriogonum cinereum* Association\***

**58b.** If *Eriogonum cinereum* is present, it has lower cover than *Salvia mellifera* AND other shrubs. **(59)**

**59a.** *Salvia mellifera* is co-dominant with *Eriogonum fasciculatum*. *Eriogonum fasciculatum* may also be sub-dominant, but will be the species with the next highest cover.

***Salvia mellifera* – *Eriogonum fasciculatum* Association\***

**59b.** *Eriogonum fasciculatum* has less cover than *Salvia mellifera* and other shrubs. **(60)**

**60a.** *Salvia mellifera* is co-dominant with *Rhus ovata*. *Rhus ovata* may also be sub-dominant, but will be the species with the next highest cover OR shares the canopy with *Ceanothus* spp. or other chaparral shrubs.

***Salvia mellifera* – *Rhus ovata* Association\***

**60b.** Stand not as above. **(61)**

**61a.** *Salvia mellifera* is co-dominant with *Malosma laurina* and/or *Artemisia californica*, or both *Malosma* and *Artemisia* are sub-dominant. In addition, only one of these species may be subdominant, if there are no other sub-dominants. *Eriogonum fasciculatum* is NOT co-dominant.

***Salvia mellifera* – *Artemisia californica* – *Malosma laurina* Association**

**61b.** Stand not as above. If *Eriogonum fasciculatum* is co-dominant in addition to *Salvia mellifera* and *Malosma laurina*, see also the *Eriogonum fasciculatum* – *Salvia apiana* Alliance, key step 69. **(62)**

**62a.** *Salvia mellifera* is co-dominant with *Malacothamnus fasciculatus*, or the combination of the covers of *Artemisia californica* and *Salvia mellifera* approach that of *Malacothamnus*. *Malacothamnus fasciculatus* may also be sub-dominant, but will be the species with the next highest cover to *Salvia mellifera*.

***Salvia mellifera* – *Malacothamnus fasciculatus* Association**

**62b.** *Malacothamnus fasciculatus* has less cover than *Salvia mellifera* and other shrubs. **(63)**

**63a.** *Salvia mellifera* is co-dominant with disturbance indicators *Lotus scoparius* [= *Acmispon glaber*], *Eriodictyon crassifolium*, *Dendromecon rigida*, and/or *Helianthemum scoparium*, alone or in combination.

***Salvia mellifera* – *Lotus scoparius* Association**

**63b.** *Salvia mellifera* is dominant.

***Salvia mellifera* Association**

**64a.** Shrubland characterized by the dominance or co-dominance of *Encelia californica* and/or *Eriogonum cinereum*. Co-dominant shrubs may include *Malosma laurina*, or *Salvia mellifera*. *Artemisia californica* may co-dominate with *Encelia californica*. **(65)**

***Encelia californica* – *Eriogonum cinereum* Alliance**

**64b.** *Encelia californica* is not an important component of the canopy, OR *Eriogonum cinereum* is co-dominant with *Artemisia californica* or *Salvia leucophylla*. Instead *Eriogonum fasciculatum*, *Artemisia californica*, or various other scrub is present and co-dominant. **(69)**

**65a.** *Eriogonum cinereum* is dominant without or less than 1% *Encelia californica* present. This type is found on steep slopes.

***Eriogonum cinereum* Association\***

**65b.** Stand not as above. **(66)**

**66a.** *Encelia californica* and *Eriogonum cinereum* co-dominate, OR both are present at greater than 1% absolute cover. Neither is greater than 60% relative cover, such that other coastal scrub species may share the canopy.

***Encelia californica* – *Eriogonum cinereum* Association\***

**66b.** Stand not as above. **(67)**

**67a.** *Encelia californica* is co-dominant with *Malosma laurina* and/or *Salvia mellifera*.

***Encelia californica* – *Malosma laurina* – *Salvia mellifera* Association\***

**67b.** Stand not as above. **(68)**

**68a.** *Encelia californica* is dominant or co-dominant with *Artemisia californica*, which is co-dominant or sub-dominant.

***Encelia californica* – *Artemisia californica* Association\***

**68b.** *Encelia californica* is dominant.

***Encelia californica* Association**

**69a.** *Eriogonum fasciculatum*, *Hesperoyucca whipplei*, or *Salvia apiana* occurs as a dominant or co-dominant with one another. In addition, *Eriogonum fasciculatum* may co-dominate with *Salvia mellifera* and/or *Malosma laurina*, OR *Salvia apiana* may co-dominate with *Artemisia californica*. **(70)**

***Eriogonum fasciculatum* – *Salvia apiana* Alliance**

**69b.** Stand not as above, OR *Eriogonum fasciculatum* is co-dominant with *Artemisia californica*. **(75)**

**70a.** *Salvia apiana* is strongly dominant. *Artemisia californica* may be present, but is a minor constituent and less important than other shrub species.

***Salvia apiana* Association (Provisional)**

**70b.** Stand not as above. **(71)**

**71a.** *Salvia apiana* and *Eriogonum fasciculatum* occur together, with or without *Artemisia californica*, as the most important shrub species in the stand.

***Eriogonum fasciculatum* – *Salvia apiana* Association**

**71b.** Stand not as above. **(72)**

**72a.** *Salvia apiana* is usually dominant or co-dominant with *Artemisia californica* and *Ericameria linearifolia* and/or *E. pinifolia*, though other shrub species such as *Lotus scoparius* [= *Acmispon glaber*] may have high cover. Stands found in broad alluvial fan washes with recent history of burns.

***Salvia apiana* – *Artemisia californica* – *Ericameria* spp. Association**

**72b.** Stand not as above. **(73)**

**73a.** *Hesperoyucca whipplei* occurs at >2% cover and is dominant or co-dominates with *Eriogonum fasciculatum* in the shrub canopy. Often found on southern exposures.

***Eriogonum fasciculatum* var. *foliolosum* – *Hesperoyucca whipplei* Association**

**73b.** Stand not as above. **(74)**

**74a.** *Eriogonum fasciculatum* occurs together with *Salvia mellifera* and *Malosma laurina*. Buckwheat may be dominant or co-dominant. *Salvia mellifera* and *Malosma laurina* may be co-dominant to merely present, but at least one of them is sub-dominant.

***Eriogonum fasciculatum* – *Salvia mellifera* – *Malosma laurina*\*  
Association**

**74b.** *Eriogonum fasciculatum* is strongly dominant.

***Eriogonum fasciculatum* Association**

**75a.** *Artemisia californica* or *Salvia leucophylla* is dominant or co-dominant in the shrub canopy. **(76)**

***Artemisia californica* – *Salvia leucophylla* Alliance**

**75b.** Stand not as above, and *Artemisia californica* is not co-dominant with *Baccharis pilularis*. Other scrub species are present and dominant including coastal bluff scrub, *Isocoma menziesii*, moist coastal scrub like *Baccharis pilularis*, or seral scrub *Lotus scoparius* [= *Acmispon glaber*], *Ericameria palmeri*, *Hazardia squarrosa*, *Malacothamnus* spp., etc. **(87)**

**76a.** *Salvia leucophylla* is strongly dominant.

***Salvia leucophylla* Association**

**76b.** Stand not as above. **(77)**

**77a.** *Artemisia californica* or *Salvia leucophylla* is dominant, or co-dominant with one another, while *Leymus condensatus* is characteristic in the understory (usually at 5% or greater absolute cover, or greater than 20% of the herbaceous layer).

***Artemisia californica* – (*Salvia leucophylla*) / *Leymus condensatus*  
Association**

**77b.** Stand not as above. **(78)**

**78a.** *Salvia leucophylla* and *Artemisia californica* are co-dominant, or one may be sub-dominant to the other that is less than 60% relative cover.

***Artemisia californica* – *Salvia leucophylla* Association**

**78b.** Stand not as above. **(79)**

**79a.** California sagebrush and purple sage codominate, while ashy buckwheat is usually subdominant and *Nassella* sp. [= *Stipa* sp.] is characteristic of the herb layer.

***Artemisia californica* – *Salvia leucophylla* – *Eriogonum cinereum* / *Nassella*  
spp. Association\***

**79b.** Stand not as above. **(80)**



**80a.** California buckwheat and purple sage occur as subdominants to codominants with California sagebrush.

***Artemisia californica* – *Eriogonum fasciculatum* – *Salvia leucophylla* Association\***

**81b.** Stand not as above. **(82)**

**82a.** California buckwheat and black sage occur as subdominants to codominants with California sagebrush.

***Artemisia californica* – *Eriogonum fasciculatum* – *Salvia mellifera* Association**

**82b.** Stand not as above. **(83)**

**83a.** California buckwheat and *Opuntia littoralis* occur as subdominants to codominants with California sagebrush.

***Artemisia californica* – *Eriogonum fasciculatum* – *Opuntia littoralis* / *Dudleya (edulis)* Association\***

**83b.** Stand not as above. **(84)**

**84a.** California buckwheat is subdominant to codominant with California sagebrush.

***Artemisia californica* – *Eriogonum fasciculatum* Association**

**84b.** Stand not as above. **(85)**

**85a.** *Eriogonum cinereum* is subdominant to codominant with California sagebrush.

***Artemisia californica* – *Eriogonum cinereum* Association\***

**85b.** Stand not as above. **(86)**

**86a.** *Artemisia californica* is dominant, or may be co-dominant with another shrub such as *Eriodictyon crassifolium* not already listed as a co-dominant in this alliance, with *Nassella* spp. [= *Stipa* spp.] or *Bromus carinatus* as a significant presence in the understory, 10% relative cover or more.

***Artemisia californica* / *Nassella (pulchra)* Association**

**86b.** *Artemisia californica* is greater than 50% of the shrub canopy. Other coastal sage shrubs are sub-dominant *Encelia californica* or *Lupinus albifrons*. Stands may be open to dense with a sparse to dense herbaceous layer. If the herbaceous layer is dense, there is not a significant complement of perennial grasses.

***Artemisia californica* Association**

**87a.** *Isocoma menziesii* (Menzies' goldenbush) is dominant or co-dominant in the stand. (88)

**Californian Coastal Beach & Dune Group (G663)**  
***Isocoma menziesii* Alliance**

**87b.** Other shrubs are dominant or co-dominant. (89)

**88a.** *Isocoma* is co-dominant with *Artemisia californica*.

***Isocoma menziesii* – *Artemisia californica* Association\***

**88b.** *Isocoma menziesii* (Menzies' goldenbush) is dominant or co-dominant in a stand and the herbaceous layer is either sparse or grassy. Shrubs that may be co-dominant include *Baccharis pilularis*.

***Isocoma menziesii* Association**

**89a.** *Baccharis pilularis* is dominant or co-dominant with *Artemisia californica*. (90)

**Californian North Coastal & Mesic Scrub Group (G662)**  
***Baccharis pilularis* Alliance**

**89b.** *Baccharis pilularis* is not as above. (91)

**90a.** *Baccharis pilularis* is co-dominant with *Artemisia californica*, both species will have between 30 and 60% relative cover.

***Baccharis pilularis* – *Artemisia californica* Association\***

**90b.** *Baccharis pilularis* is not as above.

***Baccharis pilularis* Alliance\***

**91a.** *Toxicodendron diversilobum* is strongly dominant in the shrub canopy or co-dominant with *Artemisia californica*. (92)

**Californian North Coastal & Mesic Scrub Group (G662)**  
***Toxicodendron diversilobum* Alliance**

**91b.** Another shrub is dominant. (93)

**92a.** *Toxicodendron diversilobum* is found with either *Artemisia californica* and/or *Leymus condensatus*.

***Toxicodendron diversilobum* – *Artemisia californica* / *Leymus condensatus* Association\***

**92b.** Stand not as above.

***Toxicodendron diversilobum* Alliance\***

**93a.** Big sagebrush (*Artemisia tridentata*) is dominant or co-dominant with other montane shrubs.

**Intermountain Mesic Tall Sagebrush Steppe & Shrubland Group (G302)**  
**Intermountain Dry Tall Sagebrush Steppe & Shrubland Group (G303)**  
***Artemisia tridentata* Alliance\***

**93b.** Another shrub is dominant or co-dominant, typically in seral scrub conditions. **(94)**

**94a.** *Dendromecon rigida*, *Eriodictyon crassifolium*, or *Lotus scoparius* [= *Acmispon glaber*] is dominant. **(95)**

**Californian Coastal-Foothill Seral Scrub (G782)**

***Lotus scoparius* – *Lupinus albifrons* – *Eriodictyon* spp. *crassifolium* Alliance**

**94b.** Stand not as above. **(97)**

**95a.** *Lotus scoparius* [= *Acmispon glaber*] is strongly dominant in the stand

***Lotus scoparius* Association\***

**95b.** Stand not as above. **(96)**

**96a.** *Eriodictyon crassifolium* is dominant.

***Eriodictyon crassifolium* Association (Provisional)**

**96b.** *Dendromecon rigida* is the shrub with the highest cover. This is usually a post-burn seral condition.

***Dendromecon rigida* Association**

**97a.** *Malacothamnus fasciculatus* is dominant in the shrub layer, at greater than 60% relative cover, or is co-dominant with *Salvia leucophylla*. This is usually a post-burn seral condition. **(98)**

**Californian Coastal-Foothill Seral Scrub (G782)**

***Malacothamnus fasciculatus* – *Malacothamnus* spp. Alliance**

**97b.** Stand not as above. Other seral scrub species are dominant. **(99)**

**98a.** *Salvia leucophylla* is sub-dominant to co-dominant with *Malacothamnus fasciculatus*.

***Malacothamnus fasciculatus* – *Salvia leucophylla* Association\***

**98b.** *Malacothamnus fasciculatus* is greater than 60% relative cover and *Salvia leucophylla* is not present or very low in cover.

***Malacothamnus fasciculatus* Association**

**99b.** Stand not as above. **(100)**

**100a.** *Ericameria palmeri* or *Hazardia squarrosa* is dominant in the shrub canopy. Sometimes herbaceous layer may be higher in cover than the shrub layer. **(101)**

***Hazardia squarrosa* – *Ericameria palmeri* Alliance\***

**100b.** Stand not as above **(102)**

**101a.** *Ericameria palmeri* dominant in stands.

***Ericameria palmeri* Association\***

**101b.** *Hazardia squarrosa* dominant in stands.

***Hazardia squarrosa* – *Ericameria palmeri* Alliance\***

**102a.** *Diplacus aurantiacus* [= *Mimulus aurantiacus*] is dominant or co-dominant with other seral scrub.

***Diplacus aurantiacus* Alliance\***

**102b.** *Ericameria linearifolia* and/or *Cleome isomeris* [= *Peritoma isomeris*] is dominant in the shrub canopy.

***Ericameria linearifolia* – *Cleome isomeris* Alliance  
*Ericameria linearifolia* Association**

## Key C. Herbaceous or Sparse Vegetation

1a. Vegetation is dominated by mainly wetland or mesic herbaceous species, including cattail (*Typha*), bulrush (*Schoenoplectus*), giant reed (*Arundo donax*), common reed (*Phragmites australis*), rush (*Juncus*), sedge (*Carex*), and pickleweed (*Sarcocornia* [= *Salicornia*]). Weedy annuals of wet areas are included. (2)

1b. Vegetation is dominated by grasses or upland, more xeric, herbaceous plants. (10)

2a. Stands dominated or co-dominated by cattails (*Typha* spp.), bulrush (*Schoenoplectus* spp.), or native common reed (*Phragmites australis* ssp. *americanus*). (3)

### Arid West Interior Freshwater Marsh Group (G531)

2b. Cattails, bulrush, and/or native common reed NOT dominant or co-dominant. (4)

3a. Hardstem bulrush (*Schoenoplectus acutus*) or California tule (*S. californicus*) is dominant or co-dominant with taxa including cattail species.

#### ***Schoenoplectus acutus* – *Schoenoplectus californicus* Marsh Alliance\***

3b. Cattail and/or native common reed dominates stands, or co-dominant with taxa other than bulrush. Other, shorter graminoids may have equal or somewhat greater cover. Shrubs such as coyotebrush (*Baccharis pilularis*) may be present but are at less than 10% absolute cover. Marsh baccharis (*Baccharis douglasii* [= *Baccharis glutinosa*]) and saltgrass (*Distichlis spicata*) are common associates.

#### ***Typha (angustifolia, domingensis, latifolia) Alliance\****

4a. Non-native tall herbs giant reed (*Arundo donax*) or canary-grass (*Phalaris* spp.) are strongly dominant (>60% relative cover). (5)

### Western North American Ruderal Marsh, Wet Meadow & Shrubland Group (G524)

4b. There are native species or other perennial non-natives that have higher cover than *Arundo* or *Phalaris*. (6)

5a. *Arundo donax* or non-native common reed (*Phragmites australis* spp. *berlandieri*, or other hybrid) is strongly dominant, and typically at least 60% relative cover with low cover of shrubs and other herbs.

#### ***Phragmites australis* ssp. *australis* – *Arundo donax* Semi-natural Alliance\***

5b. *Phalaris aquatica* is dominant, OR is the perennial species with highest cover, and it may be codominant or subdominant though at least 25% relative cover along with other non-natives such as *Bromus diandrus*. Native species cover is < 30% relative cover.

#### ***Phalaris aquatica* – *Phalaris arundinacea* Semi-natural Alliance\* *Phalaris aquatica* Semi-natural Association\***

**6a.** Mesic perennial grasses are dominant. Grass species of mesic habitats are *Distichlis spicata*, *Juncus acutus*, *Elymus triticoides* (*Leymus triticoides*), *Cynodon dactylon* or *Phalaris aquatica*. **(7)**

**6b.** Upland grasses or forbs dominate the stand. **(10)**

**7a.** Stands of the lowland/valley bottom species, creeping wild rye (*Leymus triticoides* [=*Elymus triticoides*]), may be dominant to co-dominant.

**North American Desert Alkaline-Saline Marsh & Playa Group (G538)**  
***Leymus cinereus* – *Leymus triticoides* Alliance\***

**7b.** *Leymus triticoides* is co-dominant with *Distichlis spicata*, or *Leymus triticoides* is neither co-dominant nor dominant. **(8)**

**8a.** *Distichlis spicata* is dominant or co-dominant in the stand. Rarely, *Juncus acutus* may be co-dominant or dominant with low cover of *Distichlis spicata* **(9)**

**North American Desert Alkaline-Saline Marsh & Playa Group (G538)**  
***Distichlis spicata* Alliance\***

**8b.** Stand not as above. **(10)**

**9a.** *Distichlis spicata* is co-dominant with annual grasses, most often with *Bromus diandrus*. May occur in sandy, sparsely vegetated situations.

***Distichlis spicata* – annual grasses Association\***

**9b.** *Distichlis spicata* is dominant, or sometimes co-dominant with ice plant (*Carpobrotus chilensis*), sea rocket (*Cakile maritima*), *Bromus maritimus*, Bermuda grass (*Cynodon dactylon*), or *Phacelia distans*.

***Distichlis spicata* Association\***

**10a.** Grasses are strongly dominant in the stand OR native perennial grasses are co-dominant. **(11)**

**10b.** Forbs dominate or co-dominate the stand, though grasses are often present at significant cover. **(18)**

**11a.** *Leymus condensatus* [=*Elymus condensatus*] dominates or co-dominates the stand. Smaller stature grasses may have equal or somewhat greater cover. Sparse shrubs often present. Usually on slopes.

***Leymus condensatus* Alliance**  
***Leymus condensatus* Association**

**11b.** Stand not as above. **(12)**



- 12a.** A *Nassella* species [= *Stipa* sp.], usually *Nassella pulchra*, has a clear presence in the stand. It varies from dominant to sub-dominant, usually with an absolute cover of 5% or more, but may be lower if the relative cover of *Nassella* and *Dichelostemma capitatum* combined is greater than 10%.

**Californian Perennial Grassland Group (G496)**  
***Nassella* spp. – *Melica* spp. Alliance\***

- 12b.** If a *Nassella* species [= *Stipa* sp.] is sub-dominant, another native perennial grass has greater cover than *Nassella* and *Dichelostemma capitatum* combined, OR *Baccharis pilularis* has a cover of 6% or more and is well distributed throughout the stand. Otherwise, *Nassella* is less than 5% cover and less than 10% of the herbaceous layer. **(13)**

- 13a.** *Bromus carinatus* or *Elymus glaucus* is the dominant perennial grass while annual grasses may be present at up to 3 times the cover. Native cover is greater than 25% of the herbaceous layer.

***Bromus carinatus* – *Elymus glaucus* Alliance\***

- 13b.** Stand not as above. **(14)**

- 14a.** Stand is dominated by another native perennial grass not listed above.

**Californian Perennial Grassland Group (G496)**

- 14b.** Stand not as above. **(15)**

- 15a.** Grassland co-dominated by *Lolium perenne* [= *Festuca perennis*], with other grasses such as *Bromus diandrus* and *Avena* spp. also common. May also be dominated by annual fescues (*Vulpia* [= *Festuca*]).

**Californian Ruderal Grassland, Meadow & Scrub Group (G497)**  
***Lolium perenne* Semi-natural Alliance\***  
***Lolium perenne* Semi-natural Association\***

- 15b.** Other grasses or forbs co-dominant or dominant. **(16)**

- 16a.** *Phalaris aquatica* is dominant, OR is the perennial species with highest cover and at least 25% relative cover with no native species of higher cover. It may be subdominant to non-native annual grasses such as *Bromus diandrus*.

**Western North American Ruderal Marsh, Wet Meadow & Shrubland Group (G524)**  
***Phalaris aquatica* – *Phalaris arundinacea* Semi-natural Alliance**  
***Phalaris aquatica* Semi-natural Association (Provisional)**

- 16b.** There are native species or other perennial non-natives that have higher cover than *Phalaris aquatica*. **(17)**

- 17a.** *Pennisetum setaceum* is strongly dominant, OR is the perennial species with highest cover and at least 25% relative cover with non-native species of higher cover. It may be co- to subdominant with somewhat higher cover other non-native annual grasses such as *Bromus diandrus*.

**North American Warm Desert Ruderal Grassland Group (G677)**  
***Pennisetum setaceum* – *Pennisetum ciliare* Semi-natural Alliance\***  
***Pennisetum setaceum* Semi-natural Association\***

- 17b.** There are native species or other non-natives that have higher cover than *Pennisetum setaceum*. **(18)**

- 18a.** *Heterotheca sessiliflora* or *Ambrosia psilostachya* is dominant in the herbaceous layer with varied cover. **(19)**

**Temperate Pacific Freshwater Wet Mudflat (G525)**

- 18b.** Stand not as above. **(20)**

- 19a.** No other perennial forb has more cover than *Heterotheca* spp. Found on sandy and cobbled gravel bars in floodplains, along riparian terraces and stream banks, flats or slopes adjacent to riparian areas, and other seasonally disturbed areas.

***Heterotheca (oregona, sessiliflora)* Alliance\***  
***Heterotheca sessiliflora* Association (Provisional)\***

- 19b.** *Ambrosia psilostachya* is dominant or co-dominant in the herbaceous layer. Found in moist meadows.

***Grindelia (camporum, stricta)* Alliance\***  
***Ambrosia psilostachya* – *Grindelia hirsutula* var. *hallii* Association (Provisional)\***

- 20a.** *Pteridium aquilinum* var. *pubescens* dominates the stand.

**Southern Vancouverian Shrub & Herbaceous Bald, Bluff & Prairie Group (G488)**  
***Bromus carinatus* – *Elymus glaucus* Alliance\***  
***Pteridium aquilinum* – Grass Association (Provisional)\***

- 20b.** Stand not as above. **(21)**

- 21a.** Sand-aster (*Corethrogyne filaginifolia*) is the primary forb and may be co-dominant (> 30% relative cover) with annual grasses, or there is a mix of native forbs with greater cover than either the exotic forbs or the exotic grasses, and sand-aster (*Corethrogyne filaginifolia*) is at least 10% relative cover. *Nassella* spp. [= *Stipa* spp.] may or may not be present at less than 10% relative cover.

**Californian Perennial Grassland Group (G496)**  
***Corethrogyne filaginifolia* – *Eriogonum (elongatum, nudum)* Alliance**  
***Corethrogyne filaginifolia* Association**

- 21b.** Stand not as above. **(22)**

**22a.** *Emmenanthe penduliflora*, *Eucrypta chrysanthemifolia*, and/or *Calystegia macrostachya*, along with many other forbs, are subdominant to codominant (especially in good rain years). Often in post-fire chamise chaparral.

***Corethrogyne filaginifolia* – *Eriogonum (elongatum, nudum)* Alliance  
*Calystegia macrostegia* – *Eucrypta chrysanthemifolia* Association\***

**22b.** Stand not as above. **(23)**

**23a.** *Selaginella bigelovii* is dominant in the herbaceous layer. Sparse shrubs may occur including *Eriogonum fasciculatum*.

**Californian Cliff, Scree & Rock Vegetation Group (G563)  
*Selaginella bigelovii* Alliance  
*Selaginella bigelovii* / *Eriogonum fasciculatum* Association**

**23b.** Stand not as above. **(24)**

**24a.** Annual forbs are co-dominant or sub-dominant with non-native annual herbs with at least 10% relative cover. **(25)**

**24b.** Annual non-native forbs and grasses are strongly dominant with at least 90% relative cover. **(29)**

**25a.** Annual vernal moist herbs are present in pools and playas, and sometimes perennial herbs are present but at low cover. *Spergularia macrotheca* var. *macrotheca* and/or *Polygonum* spp. can often occur in drying basins.

**Californian Vernal Pool Group (G530)**

**25b.** Annual upland herbs are present, including a variety of species such as poppy, lupines. **(26)**

**Californian Annual Grassland & Forb Meadow Group (G766)**

**26a.** California poppy (*Eschscholzia californica*) and/or an annual lupines (e.g., *Lupinus succulentus*) is co-dominant or co-dominant in the herbaceous layer. Depending on the timing of sampling and amount of rainfall, sometimes these annuals may be characteristically present at lower cover (e.g., 10-20% relative cover).

***Eschscholzia (californica)* – *Lupinus (nanus)* Alliance\***

**26b.** If *Eschscholzia californica* and/or annual *Lupinus* spp. are present, neither species is dominant or co-dominant. *Eschscholzia* has less cover than at least one other forb species. **(27)**

**27a.** *Lasthenia* spp., *Plantago erecta*, and/or *Vulpia microstachys* [= *Festuca microstachys*] is dominant to co-dominant with other native and/or non-native species.

***Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Alliance\***

**27b.** Stand not as above. **(28)**

**28a.** *Amsinckia intermedia* (*A. menziesii* var. *intermedia*), *A. menziesii*, and/or *Phacelia* spp is dominant or seasonally characteristic in the herbaceous layer at > 10% relative cover. Annual grasses may dominate but one or more of these annual forbs is seasonally characteristic in the herbaceous layer at > 10% relative cover. **(29)**

**Californian Annual Grassland & Forb Meadow Group (G766)**  
***Amsinckia (menziesii, tessellata)* – *Phacelia* spp. Alliance\***

**28b.** Stand not as above. **(29)**

**29a.** Non-native annual grasses are strongly dominant, including *Avena* spp., *Hordeum* spp., *Bromus* spp., *Brachypodium* spp., and *Festuca* spp. **(30)**

**Californian Ruderal Grassland, Meadow & Scrub Group (G497)**  
***Avena* spp. – *Bromus* spp. Semi-natural Alliance\***

**29b.** Other annual grasses or non-native forbs are dominant, and not as above. **(34)**

**30a.** If *Avena* spp. is high in cover, *Bromus diandrus* or Australian saltbush (*Atriplex semibaccata*) is co-dominant. Otherwise *Avena* spp. is a moderate to minor portion of the herbaceous layer. **(31)**

**30b.** *Avena* spp., either *Avena barbata* or *A. fatua*, is strongly dominant or is co-dominant with an *Erodium* sp. While *Bromus diandrus* is often present, it is less than 30% relative cover.

***Avena barbata* – *Avena fatua* Semi-natural Association\***

**31a.** *Bromus hordeaceus* is present and may be dominant. If not dominant, it or another annual grass is co-dominant with *Erodium* spp.

***Bromus hordeaceus* – *Erodium botrys* Semi-natural Association\***

**31b.** Stand not as above. **(32)**

**32a.** *Brachypodium distachyon* is dominant or co-dominant in the stand.

***Brachypodium distachyon* Semi-natural Association\***

**32b.** If *Brachypodium distachyon* is present, another annual grass has higher cover. **(33)**

**33a.** *Avena* spp. and *Bromus diandrus* co-dominate and combined are higher cover than any other species.

***Bromus diandrus* – *Avena* spp. Semi-natural Association\***

**33b.** If *Avena* spp. is present, it is less than 20% of the herbaceous layer or *Bromus diandrus* is more than 50% relative cover.

***Bromus diandrus* Semi-natural Association\***

**34a.** *Foeniculum vulgare* is important within a grassy matrix, at least 25% relative cover of the herbaceous layer. Non-native annual grasses may have higher cover.

**Californian Ruderal Grassland, Meadow & Scrub Group (G497)**  
***Conium maculatum* – *Foeniculum vulgare* Semi-natural Alliance\***  
***Foeniculum vulgare* Semi-natural Association\***

**34b.** If *Foeniculum vulgare* is present, it is less than 25% of the herbaceous layer or another perennial species co-dominates. **(35)**

**35a.** Non-native annual forbs dominate the stand. **(36)**

**Californian Ruderal Grassland, Meadow & Scrub Group (G497)**  
***Brassica nigra* – *Centaurea (solstitialis, melitensis)* Semi-natural Alliance\***

**35b.** Other forbs dominate or co-dominate. **(38)**

**36a.** *Centaurea melitensis* dominates the stand.

***Centaurea melitensis* Semi-natural Association\***

**36b.** Non-native mustards dominate the stand. **(37)**

**37a.** *Brassica nigra* dominates the stand.

***Brassica nigra* Semi-natural Association\***

**37b.** *Hirschfeldia incana* dominates the stand.

***Hirschfeldia incana* Semi-natural Association\***

**38a.** An *Erodium* sp. co-dominates with *Bromus hordeaceus*.

***Avena* spp. – *Bromus* spp. Semi-natural Alliance**  
***Bromus hordeaceus* – *Erodium botrys* Semi-natural Association\***

**38b.** Neither *Bromus hordeaceus* nor *Erodium* spp. is co-dominant. **(39)**

**39a.** Total cover of herbaceous plants is sparse, less than 15% absolute cover, and there is a shrub canopy of 5% or more. Go to **Key B.**

**39b.** Stand not as above. **(40)**

**40a.** Total cover is less than 10%, and the cover of the herbaceous layer is greater than total cover of the shrub layer. **(41)**

**Californian Cliff, Scree & Rock Vegetation Group (G563)**

**40b.** Total cover is greater than 10%. **(43)**

**41a.** The substrate is rocky or gravelly and lichen, moss and/or *Dudleya* have significant cover. **(42)**

***Dudleya cymosa* – *Dudleya lanceolata* – Lichen/Moss Sparse Alliance\***

**41b.** Stand not as above.

**Sparsely Vegetated / Barren**

**42a.** *Dudleya* is not present, while lichen has greater cover than vascular plants.

**Lichen Gravel – Bedrock Nonvascular Sparse Association\***

**42b.** Other vascular plant species have cover equal to or greater than lichen.

**Californian Cliff, Scree & Rock Vegetation Group (G563)**

**43a.** Stand has a significant native component and is primarily composed of herbaceous species that are not noted above.

**California Annual & Perennial Grassland Macrogroup**

**43b.** Nativity of species is unknown and/or shrub cover is in transition after a fire event and may become a shrub stand with recovery.

**Californian Scrub & Grassland Division**



## **Key D. Unvegetated, Developed Areas, or Planted Stands**

**1a.** Area of water impoundments and other water bodies and their margins. **(2)**

**1b.** Area not of water or adjoining water. **(6)**

**2a.** Riparian and/or wetland area that is sparsely vegetated (at least 1% absolute cover of vascular plants, but less than 10% absolute cover, and only 2% or less of any one species).

### **Sparsely vegetated drainage channels & seeps**

**2b.** Not as above. **(3)**

**3a.** Standing water areas. **(4)**

**3b.** Land along the margins of water, including the ocean. Littoral. **(5)**

**4a.** Constructed ponds, sometimes drying out seasonally, can be sparsely or well vegetated.

### **Dammed Pond Mapping Unit**

**4b.** Not as above.

### **Water body**

**5a.** Unvegetated littoral area covered by sand.

### **Beach sand Mapping Unit**

**5b.** Unvegetated littoral area dominated by rock.

### **Littoral Mapping Unit**

**6a.** Natural landforms that are mostly unvegetated. **(7)**

**6b.** Sites that are planted stands of vegetation, developed or built-upon areas, or otherwise anthropogenically disturbed. **(9)**

**7a.** Sandy area, not adjacent to water, unvegetated.

### **Sand Mapping Unit**

**7b.** Substrate is not sand. **(8)**

**8a.** Sparsely vegetated or unvegetated area of fine sediments, often caused by previous water inundation.

### **Mudflat Mapping Unit**

- 8b.** Sparsely vegetated or unvegetated area of rocky outcrops, cliffs, or other substrate, including caliche. Less than 8% absolute cover of vascular plants.

**California Cliff, Scree & Rock Vegetation Group  
Sparsely Vegetated / Barren**

- 9a.** Urban areas that are unvegetated or a matrix of development and small patches of natural and/or human-planted vegetation.

**Urban / Disturbed Mapping Unit**

- 9b.** Human-planted vegetation for landscaping or other purposes.

**Planted trees and shrubs Mapping Unit**

## Glossary of Terms Used in the Key

- **Absolute cover** – Refers to the actual percentage of the ground (surface of the plot or stand) that is covered by a species or group of species. For example, *Pinus muricata* covers between 5% and 10% of the stand. Absolute cover of all species or groups if added in a stand or plot may total greater or less than 100% because it is not a proportional number.
- **Characteristic** – Present in at least 75% of the samples for that vegetation type, with no restriction on cover.
- **Co-dominant** – Two or more abundant species with high cover in relation to other species in the layer with the highest canopy cover. We typically define co-dominant species as those with at least 30% relative cover.
- **Cover** – The primary metric used to quantify the abundance of a particular species or a particular vegetation layer within a plot. It was measured by estimating the aerial extent of the living plants, or the “bird’s-eye view” looking from above for each category.
- **Dense/Continuous cover** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where there is greater than 66 percent absolute cover.
- **Dominant** – An abundant species with high cover in relation to other species in the layer with highest canopy cover. We typically define dominant species as those with at least 50% relative cover within a particular layer.
- **Dune** – a mound, ridge or hill of loose, windblown granular material (generally sand), either bare or covered with vegetation.
- **Emergent** – A plant (or vegetation layer) is considered emergent if it includes plants that rises above a predominant vegetation layer, but that are sparse in cover. It is considered as a member of the next tallest layer, but typically has an absolute cover < 10%.
- **Herb** – Is any vascular plant species that has no main woody stem-development, and includes grasses, forbs, and perennial species that die-back seasonally.
- **Open** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where the cover is less than 33 percent absolute cover.
- **Relative cover** – Refers to the amount of the surface of the plot or stand sampled that is covered by one species (or physiognomic group) as compared to (relative to) the amount of surface of the plot or stand covered by all species (in that group). Thus, 50% relative cover means that half of the total cover of all species or physiognomic groups is composed of the single species or group in question. Standardized layers of herb, shrub, and tree (see Tables 1 and 2 for taxa assignments to these groups) are used to determine relative cover. Relative cover values are proportional numbers and, if added, total 100% for each stand (sample).

- **Semi-natural vegetation** – Stands characterized by naturalized non-native species. Examples include *Bromus diandrus* Semi-natural Association. Note that NVC vegetation types use “ruderal” to describe these plant communities.
- **Shrub** – Is normally a multi-stemmed woody plant that generally has several erect, spreading, or prostrate stems and that is usually between 0.2 meters and 5 meters tall, giving it a bushy appearance. Definitions are blurred at the low and the high ends of the height scales. At the tall end, shrubs may approach trees in size (*Heteromeles arbutifolia*, often appears tree-sized on Santa Rosa Island. At the low end, woody perennial herbs or sub-shrubs of various species are often difficult to categorize into a single life-form; usually sub-shrubs (per USDA-NRCS 2014) were categorized in the “shrub” category.
- **Sometimes** – Present in 25 to 50% of the samples with no restriction on cover.
- **Sparse** – Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where the *average* cover value is <2% absolute cover (though the range in cover could be <1-9% cover).
- **Stand** – The basic physical unit of vegetation in a landscape. It has no set size. Some vegetation stands are very small such as wetland seeps, and some may be several square kilometers in size such as desert or forest types. A stand is defined by two main unifying characteristics:
  - It has *compositional* integrity. Throughout the site, the combination of species is similar. The stand is differentiated from adjacent stands by a discernable boundary that may be abrupt or gradual.
  - It has *structural* integrity. It has a similar history or environmental setting, affording relatively similar horizontal and vertical spacing of plant species. For example, a hillside forest formerly dominated by the same species, but that has burned on the upper part of the slope and not the lower is divided into two stands. Likewise, a sparse woodland occupying a slope with shallow rocky soils is considered a different stand from an adjacent slope of a denser woodland/forest with deep moist soil and the same species.
- **Sub-dominant** – Used to describe an important species in the stand that is less than 30% relative cover.
- **Trace** – Present at less than 1% absolute cover.
- **Tree** – Is a one-stemmed woody plant that normally grows to be greater than 5 meters tall. In some cases, trees may be multiple-stemmed (ramifying) after fire or other disturbance, but size of mature plants is typically greater than 5 m and undisturbed individuals of these species are usually single stemmed.

**Usually/Often** – Present in 50 to 75% of the samples, with no restriction on cover.