2023 CALIFORNIA VEGETATION MAP IN SUPPORT OF THE DESERT RENEWABLE ENERGY CONSERVATION PLAN CONTRACT 140L1218F0102




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ABSTRACT

Under contract to the U.S. Bureau of Land Management (BLM), Aerial Information Systems (AIS) created a fine-scale vegetation map of portions of the Mojave Desert in California. AIS subcontracted the California Native Plant Society (CNPS) to conduct classification development work needed for this project, as well as accuracy assessment (AA) field data collection. The California Department of Fish and Wildlife's (CDFW) Vegetation Classification and Mapping Program (VegCAMP) provided in-kind service to allocate and score the AA.

The mapping study area consisted of approximately 437,073 acres in the Searles Valley and West Mojave Trails A subareas, spanning the desert portions of Inyo and San Bernardino Counties were mapped between 2019 and 2021 within the Desert Renewable Energy Conservation Plan (DRECP) area. The primary purpose was to develop an accurate vegetation map for portions of the California desert as it pertains to renewable energy sources and conservation opportunities, helping planners identify high quality habitat and rare communities.

The vegetation classification follows Federal Geographic Data Committee (FGDC) and National Vegetation Classification Standards (NVCS). The classification is based on new and previous survey and classification work. The map was produced applying heads-up digitizing techniques using a base of 2020 or 2018 one-meter National Agricultural Imagery Program (NAIP) imagery (true-color and color infrared), in conjunction with ancillary data and imagery sources. Map polygons are assessed for Vegetation Type, Percent Cover, Exotics, Development Disturbance, and other attributes. The minimum mapping unit (MMU) is 10 acres; exceptions are made for wetlands and certain wash types (which were mapped to a 1- or 5-acre MMU, depending on type) and areas characterized as Land Use polygons (which were mapped to a 2.5-acre MMU). In the progression to non-desert areas the MMU transitioned to 1 acre for upland types and 1/4 acre for special types.

Field reconnaissance and accuracy assessment enhanced map quality. There were a total of 126 mapping classes. The overall accuracy assessment ratings for the final vegetation map was 93% overall fuzzy accuracy.

Keywords: Bureau of Land Management, vegetation, desert, renewable energy, photointerpretation, Panamint Valley, Searles Valley, West Mojave Trails, Mojave Desert, DRECP

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CHAPTER 1: Introduction

1.1 The Mapping Program

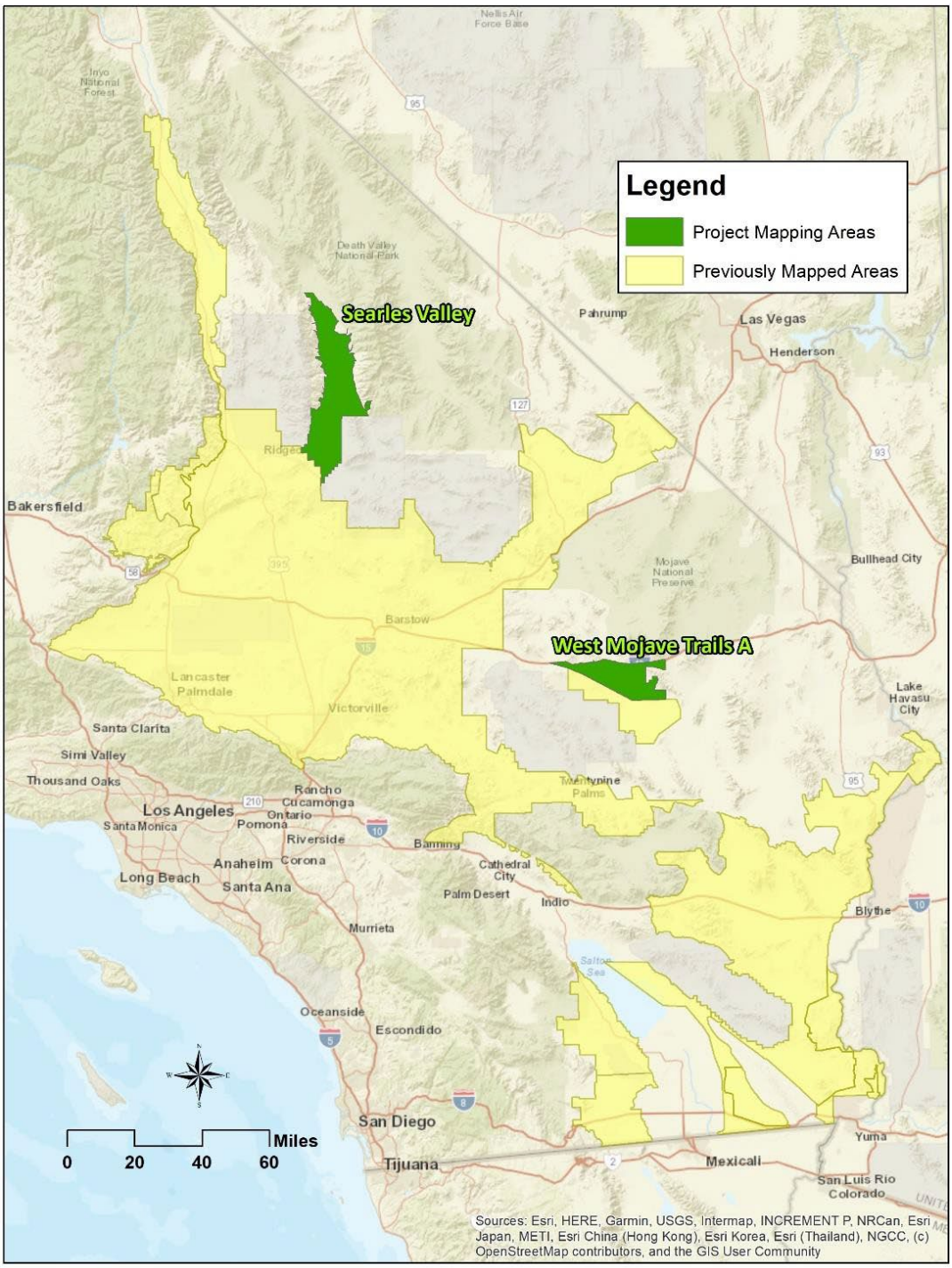
The U.S. Bureau of Land Management (BLM), under Contract 140L1218F0102, contracted Aerial Information Systems, Inc. (AIS) to continue vegetation classification development and fine-scale vegetation mapping of 437,073 acres over two subareas within Inyo and San Bernardino counties of the Desert Renewable Energy Conservation Plan (DRECP) region (See **Figure 1**). The two subareas are designated as Searles Valley (303,982 acres) and West Mojave Trails A (133,091 acres). Work performed in this effort is for the most part based on the classification and mapping standards as outlined in the Survey of California Vegetation, Classification, and Mapping Standards developed by the California Department of Fish and Wildlife's (CDFW) Vegetation, Classification, and Mapping Program (VegCAMP) (VegCAMP, 2020). However, due to the desert ecology being much different from the rest of the state, CDFW determined that mapping criteria could diverge from the state standard for cover assignment, which is to the range class. See Menke et al. (2013) for the methods and criteria used for vegetation mapping in the DRECP study area. California Native Plant Society (CNPS), as a subcontractor to AIS, conducted any classification development work and accuracy assessment (AA) needed for this project.

The initial mapping for the DRECP region was conducted in two phases from 2011 to 2016 for the California Energy Commission. The maps were primarily produced to support the DRECP by helping planners more accurately identify high quality habitat and rare communities as they consider renewable energy sources and conservation opportunities. In 2011-2012 AIS and VegCAMP created a fine-scale vegetation map covering approximately 6 million acres of portions of the Mojave and Sonoran Deserts in southern California (Menke et al., 2013). In addition, mapping of 95,981 acres within Rice and Vidal Valleys in the Colorado Desert portion of the Sonoran Desert was completed by AIS in 2013-2014 as an extension to the original project. Subsequently, between 2014 and 2016, AIS was tasked to create a fine-scale vegetation map of 2,195,415 acres of desert in Inyo, San Bernardino, Riverside, and Imperial counties in southern California. Areas mapped include the eastern and central portions of the Mojave Desert as well as the Lower Colorado River Valley (also referred to as the Colorado Desert), and the Arizona Upland subdivisions of the Sonoran Desert (Menke et al., 2016).

Between 2017 and 2019, BLM commissioned AIS to do additional mapping of three subareas covering 554,859 acres of the Mojave and Colorado Desert of Kern, San Diego, and Imperial counties (Reyes et al., 2021). The subareas were designated as Jawbone North, Salton Sea North, and Flat-Tailed Horned Lizard areas. Then again from 2017 to 2020 AIS was tasked to map 1,016,668 acres of vegetation for four subareas in Imperial, Inyo, and Kern Counties (Reyes et al., 2020), designated as Jawbone South, Owens Valley, Picacho, and Salton Sea South.

Figure 1: Location of the Study Area

below shows the current mapping area (Searles Lake and West Mojave Trails A) and the previously mapped areas within the DRECP region.



The vegetation classification, which follows Federal Geographic Data Committee (FGDC) and National Vegetation Classification Standards (NVCS), is based on the existing DRECP classification. Additional classification work was done for both Searles Valley and West Mojave Trails A, and classification analysis was based on new and previous surveys and other existing classifications. Non-vegetative classes such as water bodies and land use are included.

Field reconnaissance was conducted by staff from AIS, accompanied on a few trips by CNPS staff. AIS photo interpreters then created a map representing Vegetation Types (vegetation Alliances) and Percent Cover of different vegetative life forms. Map polygons were assessed for Exotics, Development Disturbance, and other attributes (see Appendix A). The minimum mapping unit (MMU) for vegetation is 10 acres; exceptions are made for wetlands and certain wash types, which are mapped to 1- or 5-acre MMUs respectively. Land use polygons are mapped to a 2.5-acre MMU.

Field reconnaissance was conducted by staff from AIS, accompanied on a few trips by VegCAMP and/or CNPS staff. AIS photo interpreters then created a geographic information systems (GIS) geodatabase of vegetation map units representing Vegetation Types (vegetation alliances) and Percent Cover of different vegetative life forms. Map polygons were assessed for Exotics, Development Disturbance, and other attributes (see Appendix A). The minimum mapping unit (MMU) for vegetation is 2 acres; exceptions are made for wetlands and riparian types, which are mapped to a 1-acre MMU. Land use polygons are mapped to a 1-acre MMU.

The geodatabase was produced using on-screen heads-up digitizing, with the data georeferenced to current one-meter National Agricultural Imagery Program (NAIP) imagery. Ancillary data and additional imagery sources were used to supplement attribution. The geodatabase passed quality control procedures before being finalized. Accuracy assessments (AA) were conducted by VegCAMP and CNPS staff. Sample allocation locations for AA were created by VegCAMP for CNPS field crews to use during the field data collection. Once the field plot information was entered into a database, the point data was analyzed and scored by VegCAMP.

1.2 The Project Study Area

The current mapping subareas are described below.

- **Searles Valley (Figure 2)** – This subarea falls within the northwestern portion of the Mojave Desert. It is composed of two long north-south trending valleys, actually made up of the Panamint Valley to the north and the Searles Valley at the south end of the subarea.

  The southwestern edge of the study area abuts the previous 2013 DRECP vegetation database, then follows the eastern boundary of the China Lake Naval Weapons Center northward to the Great Falls Basin Wilderness. The project boundary roughly follows the eastern edge of the Wilderness/BLM jurisdiction northward and continues following the eastern edge of the Argus Range Wilderness Study Area northward to the Death Valley National Park border. The

study area boundary turns eastward then southeastward following the national park border, then follows the western edge of the Surprise Canyon Wilderness. The study area then continues southward along the BLM jurisdictional boundary. The study area/BLM boundary follows a horseshoe shape northward then eastward until it meets the Death Valley National Park boundary again, where it turns southward along the Park boundary to the San Bernardino/Inyo County line, which is also the northern boundary of the U.S. Naval Reservation. The study area edge follows the county line/military boundary westward then turns southward corresponding to the western edge of the military reservation. The study area boundary/military boundary finally stair steps southwestward to meet the 2013 DRECP vegetation database.

- **West Mojave Trails A (Figure 3)** – This subarea falls within the Central Mojave Desert. The study area covers the southern half of the Bristol Mountains, most of the Lava Hills, and the northern end of the Marble Mountains, as well as the alluvial valleys in between.

  Starting at the small community of Ludlow, approximately where the eastbound Interstate 40 freeway Crucero Road exit ramp begins, the study area follows a slight east-northeastward trend until it meets the southern border of the Bristol Mountains Wilderness Area. It follows the southern border of the wilderness area until it meets the southern edge of the Mojave National Preserve vegetation database. The study area follows the Mojave Preserve boundary eastward to the northwest corner of Township 7N Range 14E. The study area approximates the southward trend of the western edge of Range 14E down to top of Section 19. The study area boundary turns westward for approximately 1 mile, then turns north to the pipeline. The boundary follows the pipeline westward to the northeast corner of Section 13 of Township 7N Range 12E. The boundary trends southward along the Range border to the southwest corner of Section 6 Township 6N Range 13E. The boundary follows the southern then eastern edge of Section 6, then the northern edge of Section 5, then the western and northern edge of Section 33 of Township 7N Range 13E. The study area follows the northern edge for approximately 1.35 miles, then turns south for approximately .5 miles, then east for .25 miles, then south for .62 miles, then east for approximately .12 miles. The study area border then trends south-southwestward for approximately 2.5 miles to the top of Section 21 of Township 6N Range 13E. The study area boundary turns eastward for approximately 3.5 miles, then southward for 2.8 miles until it meets the previous DRECP vegetation database. It follows the DRECP database edge westward then northwestward until the previous DRECP database turn south. The study area continues to trend west-northwestward for another 5.72 miles back to the community of Ludlow.

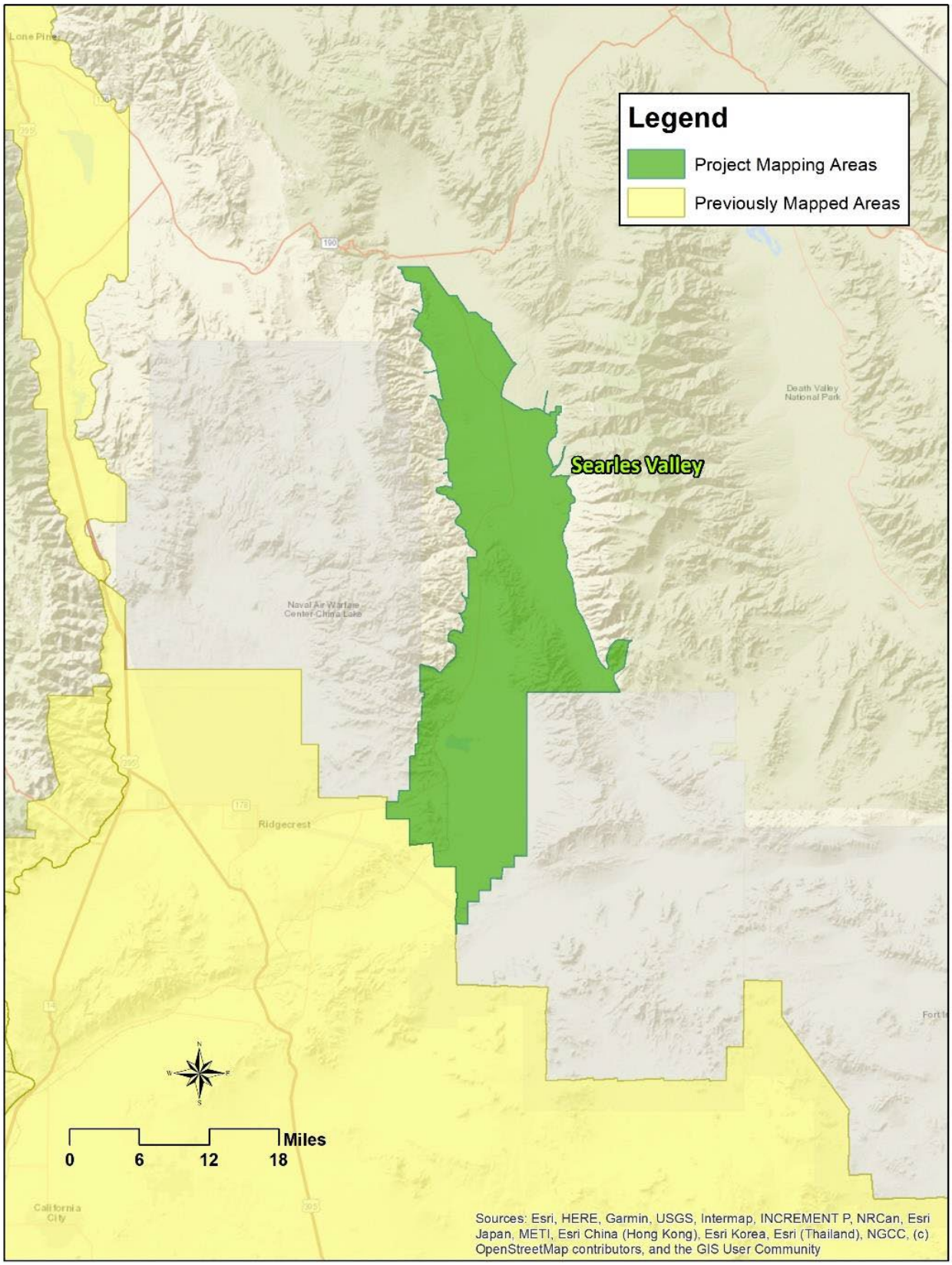


Figure 2: Location of Searles Valley Subarea

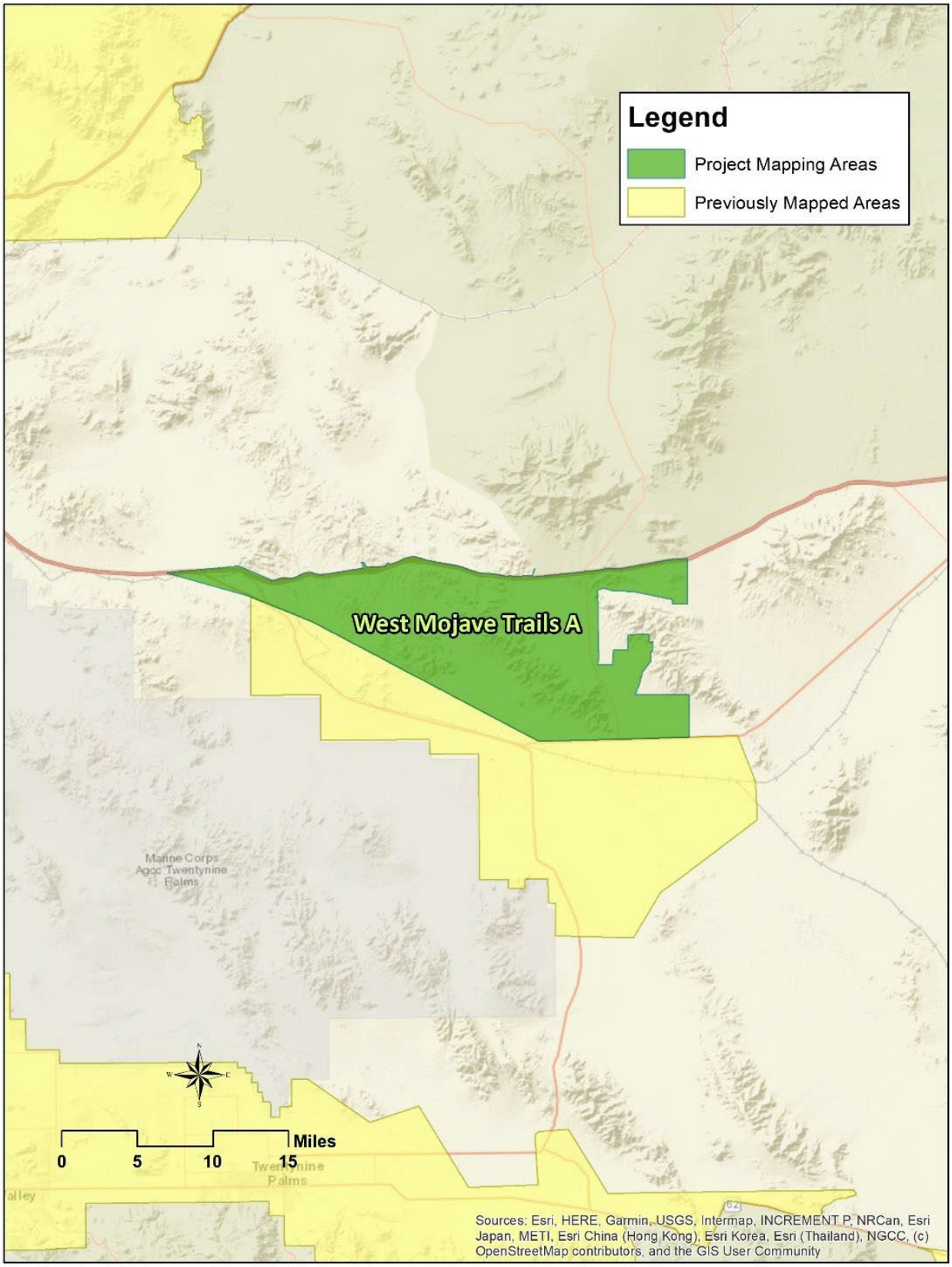


Figure 3: Location of West Mojave Trails A Subarea

CHAPTER 2: Methodology

2.1 Overview

The mapping effort began with the compilation of a preliminary mapping classification based on the previous DRECP mapping classifications. As the current project classification development progressed, the mapping classification was augmented as needed. The project team, made up of experienced photo interpreters from AIS and a field ecologist from CNPS, conducted a field reconnaissance visit to prepare for the photointerpretation effort. Using GIS technology, the photo interpreters applied their knowledge and observations of desert vegetation to create a map of vegetation types. Codes representing a suite of other attributes were assigned to the vegetation polygons. Several quality control and AA procedures were implemented prior to finalizing the geodatabase. A more detailed discussion of these methodology components follows.

2.2 Project Materials

2.2.1 Computer Software/Hardware

The mapping effort was conducted using Dell workstations with dual monitors. The extra monitor was helpful in viewing ancillary image sources and ground photos while the map was being created on the primary monitor. The maps were produced using Esri's ArcGIS software. The final map was delivered in ArcGIS 10.8.2 file geodatabase format.

2.2.2 Imagery

The digital orthophoto base for the vegetation mapping project was .6-meter 2020 NAIP imagery (true-color and color-infrared). Although other supplemental sources were used to aid in interpretation and attribute assignments, all delineations were based on the NAIP base imagery. Additional true-color digital imagery was available through ArcGIS online (variable dates depending on scale viewed), which the vegetation mappers were able to bring directly into their ArcMap sessions. The photo interpreters also referred to imagery available from the internet, such as Google Earth, Google Maps, and Bing Maps. Google Earth allowed for viewing imagery from various months of previous years, if available, which was helpful in assessing long-term trends and varying phenological appearances of the vegetation. The Google Maps and Bing Maps Street View options were sometimes used where available.

However, in some instances, photo interpreters mapped to more recent conditions than shown on the base imagery. This was done only where field observations indicated large areas of change, such as cleared land, new urbanization, etc., that had been created after the base imagery was flown. These areas were flagged in the field and subsequently evaluated back in the office. Polygons for these situations were mapped if the boundaries could be seen on post-base dated imagery (usually Google Earth) or determined by using visible features on the landscape such as fence lines or roads.

2.2.3 Ancillary Data

The distribution of vegetation on the landscape is influenced by a variety of environmental factors, such as geology, soils, topography, and fire history. Digital data sources addressing these factors helped the photo interpreters in the delineation of vegetation map units. Existing maps of vegetation were also a valuable reference. All of these data sources were georeferenced and viewed by the mappers within their ArcMap sessions.

The following sources, some of which were provided by partnering agencies, were used regularly throughout the mapping effort:

1. CalFIRE – downloaded from http://frap.cdf.ca.gov/data/frapgisdata-subset.php
2. CA State Geology Maps – downloaded from http://datagateway.nrcs.usda.gov
3. Digital Elevation Models – via ArcGIS Online
4. DRECP Vegetation Map (Menke et al., 2013; and Menke et al., 2016) – received from CDFW
5. NPS Mojave Preserve vegetation database
6. Federal Lands – downloaded from http://www.nationalatlas.gov/atlasftp.html
7. Geology USGS – downloaded from http://ngmdb.usgs.gov
8. Roads – GTLF – provided by CDFW and BLM
9. Surface Management Area – provided by BLM
10. Topographic map Digital Raster Graphics – via ArcGIS Online
11. Wetlands – downloaded from http://www.fws.gov/wetlands/Data/State-Downloads.html
12. Wilderness – downloaded from http://www.blm.gov/wo/st/en.html

2.3 Floristic Classification

The floristic vegetation classification developed for the DRECP region is a means to organize and catalog the vegetation alliance, association, or plant community stands that occur within a given area. The floristic classification is derived from, and is represented by, the classification plot information collected through a limited amount of point data surveyed in and/or extrapolated from an area. The floristic vegetation classification and corresponding descriptions and keys are developed from a multi-step process through the collaboration of CDFW, CNPS, NatureServe, and other partners, and is based on the hierarchical National Vegetation Classification Standard (NVCS).

2.3.1 Data Collection for Classification

CNPS collected classification samples in two of the project's study areas, i.e., Searles Valley and West Mojave Trails A, using stratified random sampling and directed, opportunistic sampling approaches. Existing GIS layers such as CalVEG, elevation, and geology were used to generate sample allocations to ensure multiple samples of each vegetation type were collected in the project areas. In particular, samples were spread across each study area and distributed among the vegetation types to represent rare and common types. Access to sites was factored into the sampling, including those

lands where permissions were granted and areas that were located within approximately 500 meters from roads and trails to maximize efficiency in the field. CNPS timed the data collection to coincide with peak phenology to obtain adequate cover values and reliable plant taxa identification, such that sampling took place in April 2019.

Field staff used the CNPS-CDFW Protocol for Combined Vegetation Rapid Assessment and Relevé Field Form (**See** https://www.cnps.org/plant-science/field-protocols-guidelines for copies of the form and protocol). Also, the classification samples were supplemented by using a more succinct CNPS Reconnaissance form (see Appendix F for the field forms). Protocols comply with state and national standards as defined by the Survey of California Vegetation (SCV; VegCAMP 2020) and the US National Vegetation Classification (USNVC; Faber-Langendoen et al. 2009, Jennings et al. 2009). Each survey location was digitally photographed and marked using a GPS device to produce a GIS map of the surveyed data points. Recorded data included plant species composition, species abundance, structure, site impacts, and environmental setting. Percent cover of plant species was visually estimated both individually and by vegetation strata (tree, shrub, herbaceous).

In addition to the data collected in 2019, CNPS compiled other available vegetation sampling data from the region upon contacting partners for information. They selected data found within the ecological subsections that overlap with the Searles Valley and West Mojave Trails A study areas. This included data from the USGS Mojave Desert Ecosystem project (Thomas et al. 2004), and regional eastern California plot data from Michele Slaton (ecologist at US Forest Service). The vegetation data was reviewed for quality and accuracy, and the compiled data was archived into a standardized MS Access database. CNPS used the USDA NRCS PLANTS Database (USDA-NRCS, 2015) to normalize the plant nomenclature and species codes. Data will be publicly available upon project completion through CDFW's Biogeographic Information and Observation System (BIOS) and other data-sharing utilities upon project completion. The number of vegetation samples compiled and analyzed for vegetation classification is summarized below in Table 1.

Table 1. Compilation of Vegetation Classification Samples for Searles Valley and West Mojave Trails A Subareas

Type/Location of sampling	Entity	Type of survey	No. of samples
Alluvial Scrub	Jeanne Wirka (UC Davis)	Transects (50 m Line point intercept)	2
Castle Mountains National Monument	CNPS and BLM	Rapid assessments and Relevés	33
Central Mojave	US Geological Survey	Plots, Fixed area (0.1 ha)	583

Type/Location of sampling	Entity	Type of survey	No. of samples
Death Valley	National Park Service	Plots, Fixed area (0.1 ha) and Invasive plant area assessments	53
Death Valley	National Park Service	Plots, Fixed area (0.1 ha)	101
Death Valley	University of Nevada Reno	Springs Polygons and Points	10
Eastern California	Michelé Slaton (US Forest Service)	Plots, Fixed area (800 m^2 tree, 400m^2 shrub, 100 m^2 herb)	122
Mojave National Preserve	Julie Evens (HSU)	Plots, Fixed area (0.1 ha)	175
Mojave National Preserve	Joe McAuliffe	Perennial Grassland surveys	61
Mojave National Preserve	Johnson	Transects (50 m Line point intercept)	341
Mojave National Preserve	Natural Resources Conservation Service	Plots, Fixed Area	2
Mojave National Preserve	National Park Service	Rapid assessments, Relevés	361
Owens Valley	Owens Valley	Rapid assessments, Relevés	22
Searles Valley	**CNPS**	Rapid assessments and Reconnaissance	34
West Mojave Trails A	**CNPS**	Rapid assessments and Reconnaissance	37
West Mojave Trails A	Todd Keeler-Wolf	Rapid assessments, Relevés	6
Tehachapi Corridor	Dept. of Fish & Wildlife	Rapid assessments	57

2.3.2 Data Analysis for Classification & Vegetation Key

Descriptions: Upon compiling data from related projects, CNPS co-analyzed the various datasets to classify vegetation in Searles Valley, West Mojave Trails National Monument, and adjacent/similar areas. Data was imported into PC-ORD and converted into plot-by- species matrices. Taxa that occurred in a small number of plots (i.e., less than 5 plots) were removed to generate additional plot-by-species matrices that had lower alpha and beta diversity and lower coefficients of variation for species (typically <200%).

CNPS employed hierarchical cluster analyses to group similar surveys based on plant species composition and abundance. These groups, along with indicator species

analyses, were interpreted to develop a hierarchical classification that defines the vegetation types for a project area. Cluster analysis was used with Sørensen distance and Flexible beta linkage method (McCune and Mefford 2006). Grouping levels with the lowest average p-values and highest number of significant indicators were used to drive the vegetation classification process. CNPS then assigned each survey to an Alliance and an Association (if possible) based on the analyses results, along with information from existing classifications and related data. Upon assigning classification names, additions and changes to the classification were reviewed with CDFW VegCAMP staff to ensure compliance with the Manual of California Vegetation (Sawyer et al. 2009) and the US National Vegetation Classification (FGDC 2008, Jennings et al. 2009).

During the floristic classification development, CNPS updated the vegetation field key that was originally generated for the DRECP area (VegCAMP 2013 and AIS 2013), in which the key is organized by various characteristics such as layer (e.g., tree, shrub, herb), NVC name (e.g., Group, Alliance, and Association), and habitat (e.g., riparian/wetland, upland). This key provides users with the ability to assess vegetation types while in the field or while photo interpreting and delineating polygons. Field testing of the vegetation key was performed during the field reconnaissance for the mapping stage of the Searles Valley and West Mojave Trails A in 2020. See Appendix G for an updated version of the field key. Also, crosswalks showing the relationship of the vegetation types in the classification to the USNVC and others (e.g., CWHR, CalVEG) are provided in the GIS vegetation map products.

Detailed vegetation descriptions were written for each Alliance including criteria such as: sample size, distribution in the study area, summarized environmental data, cover by lifeform, and summarized plant species composition, percent constancy and abundance values for species in the type. Concept summaries also were written for associations.

2.4 Mapping Classification

Mapping of the vegetation using the floristic classification may be limited by the constraints of the aerial imagery (color limitations and resolution), the minimum mapping unit (MMU) resolution for the project, or the complexity of the stands on the ground and their relationships with one another. Therefore, a mapping classification is developed to outline and catalog mappable vegetation units. The mapping classification contains mappable vegetation types, as well as what are called Mapping Units. Mapping Units are units that are not included in the floristic vegetation classification, such as sand, rock, mud, or approved units composed of multiple individual types that are not mappable due to MMU constraints but consistently occur together on the ground as ecologically related complexes (the latter being a rare exception). The mapping classification also includes additional attributes outside of the vegetation type, such as percent cover of conifer trees, hardwood trees, shrubs, and herbaceous vegetation; disturbance attributes, and others (See Appendix A).

For the current project, new floristic classification analysis was completed for the Searles Valley and West Mojave Trails A subareas. The map classification was based on the original and subsequent DRECP mapping projects (Menke et al., 2013, Menke et

al., 2016, Reyes et al., 2020, and Reyes et al., 2021). The original classification was provided by VegCAMP, and is based largely on work done in the area for previous and ongoing projects: Vegetation Mapping of Anza-Borrego Desert State Park and Environs (Keeler-Wolf et al., 1998), the Mojave Desert Ecosystem Program's Vegetation Database (Thomas et al., 2004), Vegetation of Joshua Tree National Park (La Doux et al., 2013), and Vegetation Classification at Lake Mead National Recreation Area, Mojave National Preserve, Castle Mountain National Monument, and Death Valley National Park (Evens et al., 2020). Refinements to the mapping classification were made as mapping proceeded. *A Manual of California Vegetation* (Sawyer et al., 2009) was consulted as a reference to guide the revisions. Any potential classification changes encountered by AIS as the mapping progressed were brought to the attention of CNPS and VegCAMP staff for possible floristic classification revision.

2.5 Field Reconnaissance

Field reconnaissance/verification visits serve multiple 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, is to answer questions regarding vegetation assemblages that arise during the photointerpretation process and to check the mapping and attribution prior to delivering the data for AA. In addition, 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 test the floristic key and gain understanding from the photo interpreters' perspective about assessing vegetation through the framework of map creation.

Between October 2020 and June 2021, AIS conducted five field reconnaissance/ verification trips. The trips are summarized in **Table 2**.

Table 2: Summary of Field Reconnaissance Trips

Trip No.	Dates	Staff from:	Location	Number of Observations Collected
1	October 21-24, 2020	AIS/CNPS	Reconnaissance: West Mojave Trails A subarea	591
2	November 16-24, 2020	AIS/CNPS	Reconnaissance: Searles Valley, Panamint Valley	622
3	January 25-29, 2021	AIS	Verification: Searles Valley, Panamint Valley	797

Trip No.	Dates	Staff from:	Location	Number of Observations Collected
4	May 17-22, 2021	AIS	Verification: Searles Valley, Panamint Valley	932
5	June 7-10, 2021	AIS	Verification: West Mojave Trails A subarea	468

Field crews from AIS collected over 3400 reconnaissance/verification observations as shown in **Figures 4 and 5**.

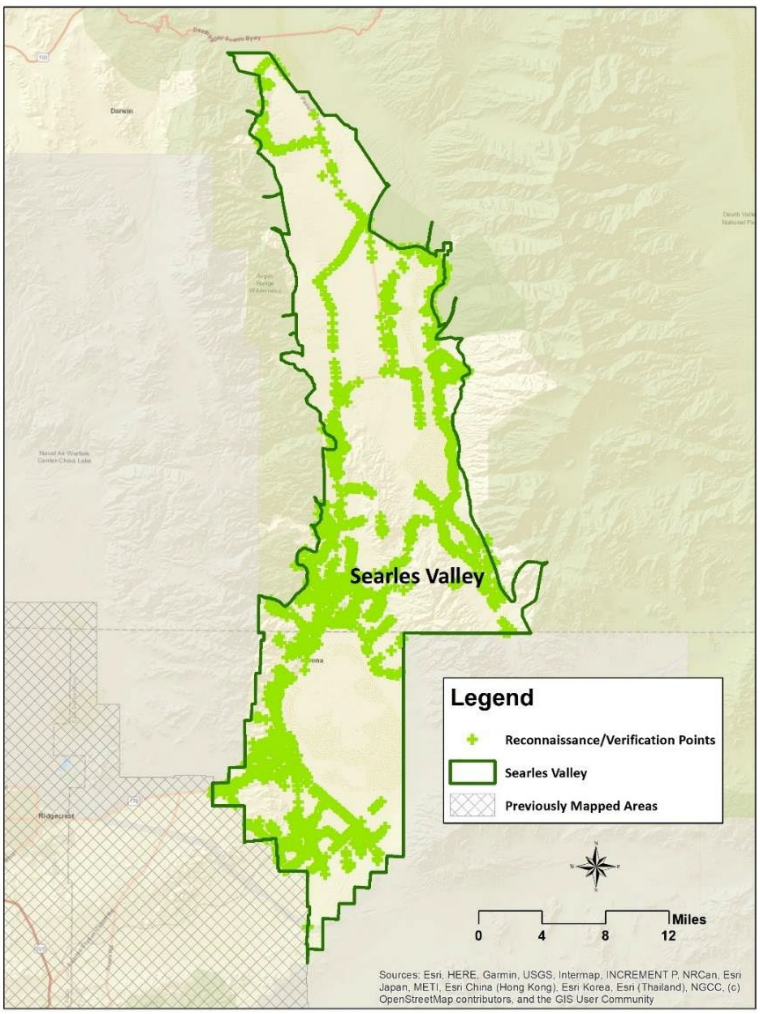


Figure 4: Location of Reconnaissance/Verification Observation Points – Searles Valley Subarea

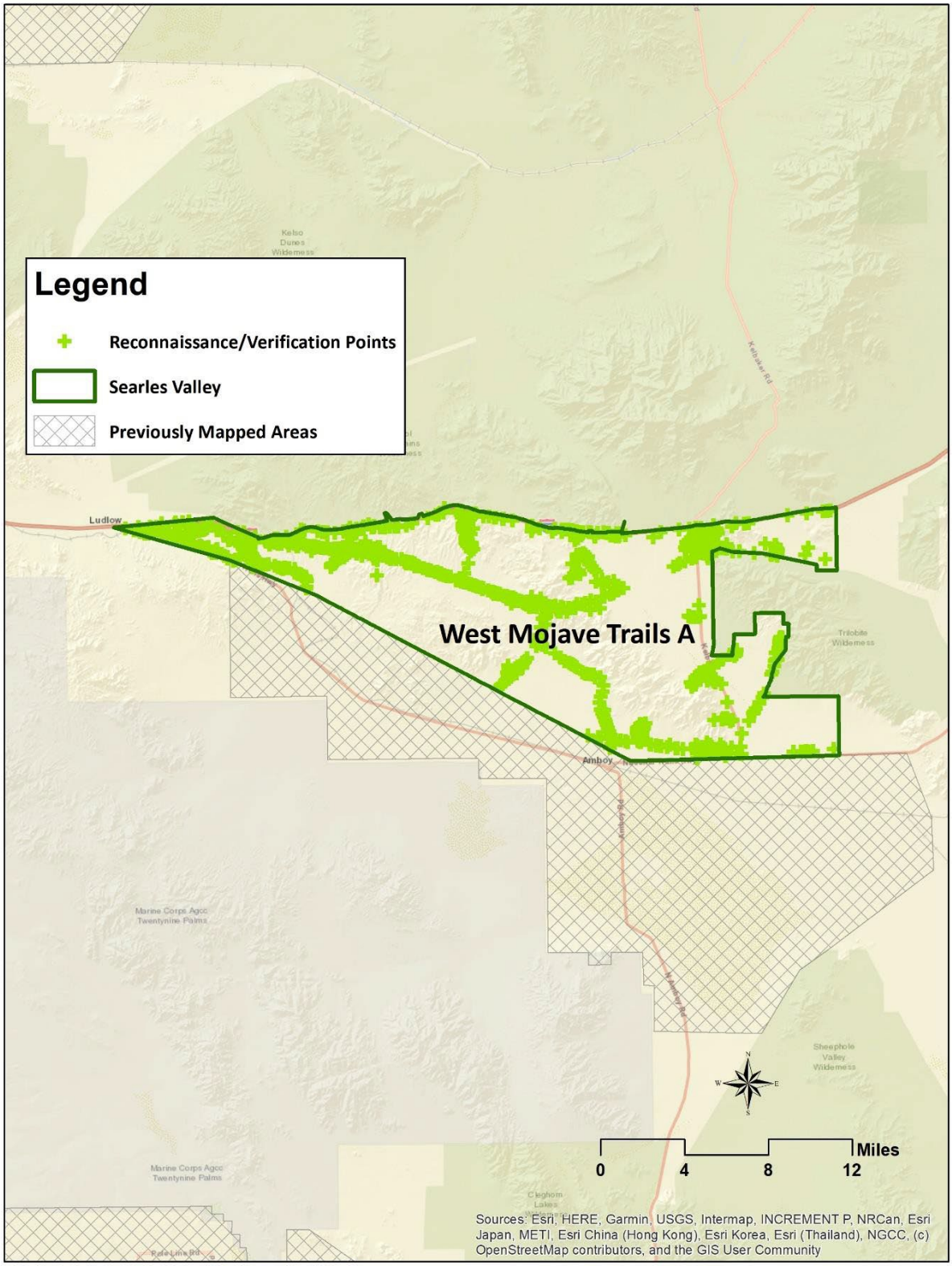


Figure 5: Location of Reconnaissance/Verification Observation Points – West Mojave Trails A Subarea

Prior to each trip, AIS staff reviewed imagery on-screen to identify and select potential reconnaissance sites in close proximity to roads. Sites were selected to represent different vegetation types and percent cover, as well as variations in geography, landform, and abiotic factors such as percent slope, aspect, shape of the slope, and elevation. Multiple sites were chosen to provide alternatives in case one or more sites proved inaccessible. Field routes were planned to maximize the number of vegetation types and ecological regions visited while taking into consideration time constraints and accessibility.

The field crew used the Collector application for ArcGIS on Apple computer tablets to facilitate navigation and data collection. The vegetation database imagery, roads, and any other pertinent ancillary data were loaded onto the tablet prior to the field trip.

During reconnaissance/verification, crews traversed the areas in a 4WD vehicle and stopped at the preselected sites. Areas encountered in transit between initially selected sites, and areas of noteworthy or unusual significance, were sometimes added in the field as observation points. Also, observation points were frequently taken to mark the transition between vegetation types, with the intent of helping photo interpreters determine the edges of stands. A single observation 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 typically determined using a compass and laser rangefinder. Field crew members recorded each location visited on a GPS unit and logged pertinent information into the Collector app on the tablet.

At many observation points, the crew took digital color ground photos. The corresponding field point, and other pertinent information were recorded and available for reference during the mapping effort. The field data and ground photos were essential for correlating conditions seen on the aerial imagery to conditions on the ground.

2.6 Photointerpretation Mapping Procedures

There are two distinct aspects of the photointerpretation mapping process. In what can be called the “photointerpretation process,” the photo interpreter applies his or her understanding of photo signature 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.

2.6.1 Photointerpretation Process

Photointerpretation is the process of identifying map units based on their photo signature. All land cover features have a photo signature. These signatures are defined by the color, texture, tone, size, and pattern exhibited on the aerial imagery. By observing the context and extent of the photo signatures associated with specific land

cover types, the photo interpreter is able to identify and delineate the boundaries between plant communities or signature units.

It should be noted that vegetation stature, as well as the scale and resolution of the aerial imagery, determine the visibility of individual plants, and the degree to which they can be photo interpreted. Trees and shrubs are usually visible as individuals on high-resolution digital imagery. However, grasses (other than bunch grass clumps) are rarely seen as individual plants.

Environmental factors, such as elevation, slope, and aspect, also play an important part in the photointerpretation decision-making process. Knowledge of these factors, and how plant communities respond to them, guides a photo interpreter in choosing from among alliances with similar photo signatures. Beyond this, such knowledge enables vegetation mappers to create biogeographical models of expected vegetation communities where the vegetation types are indistinct on the imagery. This ecological approach produces a more accurate product than would be created by relying solely on extracting information from the imagery, which is subject to variations in clarity and ground conditions.

Ancillary data sources (see Section 2.2.3) and field reconnaissance data are used to complement and assist the mapper in their photointerpretation and attribute code assignment process. For example, classification plot point data contains the location of the plot as well as miscellaneous data related to the species composition and cover of the stand, abiotic and ecological information, and site history, such as fire information.

The detailed descriptions of each vegetation type found in Appendix B include numerous examples of the types of information the photo interpreters incorporate into their understanding of the models. To give some examples, one shrub alliance may favor rocky slopes, while another is found at the perimeters of dry lakes. Some alliances flourish on disturbed sites, while others cannot tolerate the cool temperatures at higher elevations. And, some alliances are ubiquitous and found in a variety of settings.

The descriptions also discuss the relative percent cover of various plant species in the alliance. Frequently, complicated relationships exist between the relative covers of plants, such as in alliances named for indicator species having lower percent cover than other species present. Thus, both environmental setting and rules regarding relative cover factor into the intelligent delineation of vegetation polygons.

2.6.2 Mapping Process

Just as the use of mental models by experienced photo interpreters contributed to the production of a high-quality vegetation map, the use of tried-and-true mapping procedures allowed for the map to be produced in a highly efficient manner. For example, the study area was divided into production modules that for the most part corresponded to USGS 7.5-minute topographic quadrangles or portions thereof. This expedited project work flow by enabling several staff members to work on the mapping effort simultaneously.

Each vegetation mapper brought one of the modules into his or her ArcMap session.

Using an on-screen heads-up digitizing method, the photo interpreters had at their disposal a suite of standard and custom ArcMap tools to facilitate the creation of polygons. The photo interpreters generally viewed the imagery at scales ranging from below 1:1000 to 1:3000. They used variations in signature to draft boundaries separating areas of different vegetation types and/or distinct categories of percent cover of several stature levels. To assist in boundary placement and coding decisions, photo interpreters also referenced supplemental imagery, vegetation field data, and other data, such as elevation contours and fire history. These sources were displayed in the ArcMap sessions as needed.

Photo interpreters assigned each polygon the appropriate attribute code string: Vegetation Type (Map Unit), six different Percent Cover types, Exotics, Roadedness Disturbance, Development Disturbance, Anthropogenically Altered Disturbance, Altered Hydrologic Regime Modifier, *Olneya tesota – Parkinsonia florida* (OLTE_PAFL) Presence Modifier, Land Use, and Method ID. The map classification is presented in Appendix A.

A custom coding menu enabled values to be assigned efficiently, minimizing the possibilities for entry errors. The codes themselves were entered as numeric values, which are easier to input and manipulate than alphanumeric codes or drop-down menus. Numeric code values also allow for the hierarchical grouping of like vegetation communities, reminding the mapper at a glance which alliance is found in a particular hierarchical grouping. Once the geodatabase neared completion, the actual vegetation type names were correlated to their numeric value and added to the geodatabase.

As the individual modules were completed, they were edge-matched and checked for invalid codes and topology errors. As mapping progressed, completed modules within a subarea unit were joined together. These database units were subject to further processing, edge-match checks, and review by a senior staff member before being delivered to VegCAMP for AA allocation, prior to AA data collection by CNPS. Quality control procedures implemented during the mapping effort and before final delivery of the data improved the consistency and accuracy of the overall database. Quality control and AA will be discussed in greater detail in later sections of this report.

2.6.3 Mapping Criteria

As discussed above, reference sources, photointerpretation training, knowledge of vegetation communities, as well as the use of appropriate GIS tools, are all essential in creating a quality vegetation map. However, without the establishment and refinement of mapping criteria, a given vegetation map could contain a number of discrepancies, as different staff members can approach the task with different assumptions and styles. Guidelines and rules regarding exceptions, special situations, and minimum feature size are discussed and disseminated to all staff members before and during the mapping effort. This creates a clear and consistent product. Establishing criteria also makes the mapping process more efficient, as individual photo interpreters do not have to pause too long to consider how best to capture the more common ambiguous situations that are confronted.

The specific criteria for each attribute type are discussed below under the appropriate

heading.

2.6.3.1 Vegetation Type (Map Unit)

The final map contains 38 types that were mapped, composed of 29 Alliances and Alliance-level types such as Provisional Alliances, and Semi-natural Stands, and Mapping Units; and 3 miscellaneous classes relating to features such as agriculture, water, and urban disturbance; and 6 Group-level types and Mapping Units. When the photo interpreter could not confidently classify a polygon at the Alliance level, the polygon was assigned a broader Group-level or Macrogroup-level code. This was most common with herbaceous communities, whose differences at the Alliance level are often not readily discernible on imagery. Each map unit is described in Appendix B; the map classification is presented in Appendix A; and a summary table of polygon counts and acreage by map unit is presented in Appendix C.

2.6.3.1.1 Minimum Mapping Unit Size Considerations

Minimum polygon size is an important consideration when creating and viewing a vegetation geodatabase. The choice of an MMU is influenced by the clarity of the imagery, the purpose of the data, and time and budget constraints. MMU can vary for different categories of features being mapped.

The map classification presented in Appendix A indicates the MMU for each map unit class. In this project, the MMU for upland vegetation is 10 acres. This encompasses the majority of the stands mapped. Exceptions were created for vegetation stands of special significance. In this mapping effort, riparian vegetation and wetlands and certain wash types were mapped to a 1-acre MMU. Another exception to the upland vegetation MMU involved stands of allscale scrub (*Atriplex polycarpa*), California joint fir (*Ephedra californica*), and cheesebush (*Ambrosia salsola*) occurring in washes, where they were mapped with a 5-acre MMU. Where these three types occurred outside of washes, a 10-acre MMU was applied. Polygons representing land use were mapped with a 2.5-acre MMU (see Appendix E for more detail). For non-desert areas the MMU for upland types is 1 acre, and 1/4 acre for riparian and wetland types. In the transition zone from desert to non-desert areas polygon MMU graded from 10 acres to 1 acre. This transition MMU criteria did not apply to the Searles Valley or West Mojave Trails A subareas.

CDFW's long-range goal is to map vegetation for the entire state of California. This is accomplished as funding or need allows, one area or project at a time. The desert vegetation geodatabase created in this project is to be incorporated into the Statewide vegetation mapping effort. The general Statewide mapping criteria (VegCAMP, 2020) specifies an MMU of one acre to ten acres. It was established that a 10-acre MMU would apply to desert environs.

In addition to the MMU criteria of the Statewide classification, the desert mapping effort had a different set of criteria regarding percent cover. In Statewide mapping criteria, a life form generally needs to account for at least 8 to 10 percent cover in order for an Alliance of that life form to be mapped (Menke et al., 2013). In the desert, due to the sparse distribution of vegetation, the threshold for designating an Alliance of a certain

life form is generally 2 to 3 percent cover. However, tree types in the desert study area, such as the Fremont cottonwood (*Populus fremontii*), red willow (*Salix laevigata*) and black willow (*Salix gooddingii*) types, were mapped using a 5 to 10 percent cover criteria due to their distribution in desert and non-desert settings.

A summary of the minimum mapping units for this mapping effort is presented in **Table 3**.

Table 3: Minimum Mapping Units

Mapped Feature	Minimum Mapping Unit Desert	Minimum Mapping Unit Non-desert
Riparian vegetation; wetlands; certain wash types	1 acre	1/4 acre
Water: perennial streams and lakes/ponds, dammed ephemeral ponds, Colorado River Aqueduct, All American Canal, East Highline Canal, Coachella Canal	1 acre	1/4 acre
Land use: agriculture, built-up, water impoundment features	2.5 acres	1 acre
Atriplex polycarpa, Ephedra californica and Ambrosia salsola in washes	5 acres	1 acre
Upland vegetation	10 acres	1 acre
Vacant areas within settlements; agriculture and water within urban windows	10 acres	1 acre
Flood control basins (smaller ones are mapped as built-up land use)	10 acres	1 acre
Urban windows	1 square mile	1 square mile

The establishment of an MMU entails the need for making rules for aggregating stands below MMU. In general, similar life forms are aggregated together: tree-dominated types are aggregated with other tree-dominated types, shrub types with other shrub types, and herbaceous types with other herbaceous vegetation types. However, if possible, wetland vegetation types are not aggregated with upland types, even if they are in the same life form. Another guideline is that a unit below MMU is aggregated with the vegetation type that completely surrounds it. Finally, if a unit that is below MMU is the same life form as two adjacent larger stands, and the adjacent stand types are very

dissimilar in environment, the unit may be aggregated with the more similar adjacent type.

In addition to establishing MMU size, guidelines were established for the minimum mapping width (MMW) of a map polygon. The rule of thumb was to make the minimum width roughly half the width of a square MMU box. This guideline did not preclude the creation of polygons where a small section fell below the minimum width, as long as the greater portion of the polygon met the stated criteria in an attempt to capture the continuity of the riparian or wetland type.

Another type of mapping consideration pertains to sparsely vegetated to nonvegetated types. It was assumed that all vegetation polygons contained some unvegetated or barren areas. On the other hand, sparsely vegetated to nonvegetated types were not mapped in the database unless they met the minimum mapping resolution and could exist as standalone polygons. Examples of these include: Unvegetated wash and river bottom Mapping Unit, Massive sparsely vegetated rock outcrop Mapping Unit, and Sparsely vegetated playa (Ephemeral annuals) Mapping Unit. Percent cover MMU considerations are discussed in Section 2.6.3.2.

2.6.1.3.1.2 Miscellaneous Classes

Miscellaneous classes include types that are not covered by the floristic classification. In order to have a comprehensive vegetation map, these types need to be accounted for in the mapping classification. Miscellaneous classification categories include types such as agriculture, urban/disturbance, and water features.

The relationship between vegetation and land use is sometimes complicated because of the possibility of natural vegetation and land use occurring on the same extent of land. For planning purposes, it is important to represent both the natural vegetation extent as well as the urban/land use component. This project's mapping classification is structured to accommodate these complications. As mentioned above, some of the Vegetation Type (Map Unit) categories were reserved for land use types such as agriculture, urban disturbance, and water features. However, Land Use was also an attribute of vegetation polygons, along with Exotics, Roadedness Disturbance, etc. A polygon that had a land use code value in Vegetation Type (Map Unit) was automatically populated with a corresponding land use code value in the Land Use layer.

Why represent land use in two different ways? It has to do with the possibility of natural vegetation and land use occurring on the same plot of land. For instance, in the desert setting, this may involve a residential area with houses and natural vegetation intermingled. For planning purposes, it is important to represent both the natural vegetation extent as well as the urban/land use component. With the existence of the Land Use layer, a polygon can be coded as the Joshua tree woodland Alliance – a vegetation type – but in the Land Use layer, the same polygon can be coded as having an Urban component. If only a vegetation layer were mapped, the photo interpreter would have to choose between calling out a vegetation type or a land use. One or the

other would be lost. Modifications to the mapping rules for this scenario do exist in certain areas and are described in Appendix E.

In this project the concept of an “urban window” was also applied. Urban window, one of the Miscellaneous Classes in the vegetation map unit classification, is defined as a fully developed contiguous area of built-up and disturbed lands greater than one square mile in size. Natural vegetation stands may exist within an urban window, but they generally are not viable candidates for mitigation due to the surrounding urbanization. Therefore, natural vegetation was not mapped within an urban window unless it formed an area at least 10 acres in size and was not split by roads or other manmade features. Other special criteria rules developed for representing features in or adjoining urban windows are described in Appendix E.

Agriculture was another type of feature covered in the Miscellaneous Classes. Woody agriculture (orchards, vineyards) was distinguished from row agriculture. An important consideration in mapping agriculture in the desert is deciding whether a plot of land that was farmed in the past should still be considered as active agriculture. A currently inactive plot of agricultural land may have been abandoned permanently, or it may just be in a fallow phase before farming resumes. To handle the uncertainty in such cases, a decision was made to review image sets covering the five years prior to the base imagery date. If the imagery showed that the land had been actively farmed in any of those years, then it was mapped as agriculture.

Because of its importance in the desert setting, water was mapped with an MMU of one acre. Distinctions were made between perennial stream channels, lakes and ponds, aqueducts and canals (including the Los Angeles Aqueduct, All American Canal, and the Westside Main Canal), and water impoundment features.

It should be noted that percent cover was not evaluated for most of the Miscellaneous Classes. A thorough discussion of the rules applied to each of the Miscellaneous Classes can be found in Appendix E.

2.6.3.2 Percent Cover

Percent cover, also referred to as “density,” is a quantitative estimate of the aerial extent of the living plants for each vegetation strata within a stand. Cover is the primary metric used to quantify the importance or abundance of a life form and/or species.

Photo interpreters assessed the total cover of vegetation associated with each of the following: conifers, hardwoods, Joshua trees, trees as a whole (including Joshua trees), shrubs, and herbaceous plants. Appendix D includes six tables that present the ranges of percent cover used for each of these categories, along with relevant notes. These tables are adapted from VegCAMP 2013.

To determine the vegetative cover, photo interpreters assigned percentages to the different life forms visible on the imagery, including nonvegetated areas. The total percent cover of trees, shrubs, herbaceous and nonvegetated areas had to add up to

100 percent. The cover percentages were then converted into the appropriate cover category.

Photo interpreters formed separate polygons when there were changes from one cover class to another within a vegetation type or mapping unit as long as the resulting polygons were at least double the size of the applicable MMU. A given vegetation polygon might have been subdivided due to cover differences regardless of which strata the cover difference occurred in. For example, two adjacent polygons in the geodatabase may have had the same hardwood tree vegetation type assigned but different cover categories for shrubs (for example, >0-1% versus >5-15%).

The photo interpreters considered the coverage pattern of each life form before assigning a cover code to the polygon. To ensure consistency, it was helpful to compare percent cover values of polygons with clumped and unevenly distributed vegetation to those of similar-sized polygons with an even distribution of plant cover.

2.6.3.1 Percent Cover Mapping Considerations

It is important to note that the photo interpreters could only accurately quantify the vegetation that is visible on the aerial imagery. Therefore, “bird’s eye” total cover was mapped, meaning that the cover of understory strata that were obscured by overstory strata was not included. For this reason, total cover for shrubs and herbaceous plants may be underestimated if their extent was hidden under the crowns of overstory trees and/or shrubs, and may differ from assessments done on the ground by field crews.

Where the cover of a particular life form is very sparse, it can be difficult to decide between a cover class “0” (None or Not observable) and “1” (>0 to 1 percent). The photo interpreters looked for the consistent presence of very sparse types throughout a polygon before assigning it a cover class of “1.”

In the desert environment, it is rare for cover to exceed 25 percent. However, denser cover is sometimes found among riparian stands and tamarisk. Where overstory cover did happen to exceed 40 percent, it was considered too dense to give a reliable estimate of lower tier canopy or understory percent cover. In these situations, the code assigned for percent cover for the understory life forms would be “Not applicable/Not assigned.” This same criterion is used in the Statewide mapping effort.

The date that the base aerial photography mission was flown influences the percent cover assigned to vegetation types. Subsequent field verification and AA must take into consideration the following factors that can cause apparent discrepancies between the percent cover evident on the imagery and percent cover seen in the field:

- Seasonality - The percent cover of most plants is variable due to their annual growth cycle. Depending on whether the aerial imagery was taken during the wet season or the dry season, a mapped unit could show a different percent cover on the aerial imagery than is observed during an on-site visit at a different time of the year. Differences in leafiness (cold deciduous, drought deciduous) can affect plant cover determination. Leaf-on conditions obscure the understory. Imagery of

leaf-off conditions would allow photointerpretation of the understory, but make it difficult to identify the overstory species since there is no foliage present.

- Annual variability - The environmental conditions at the time of the imagery (wet vs. drought years, flooding, etc.) may contrast with the conditions seen during on-site field visits thus resulting in differences of the percent cover assigned to a polygon in the field versus those assigned during photointerpretation.
- Dead vegetation – When vegetation is dead, it is not counted in the cover class analysis; however, vegetation in a stressed phenology state is included in the cover class density. Both dead and stressed vegetation were encountered during this mapping effort. Determining the difference between dead and stressed vegetation solely through photointerpretation was difficult, so field information reflecting the conditions on the ground were used when possible. Where dead vegetation was so dense that it obscured the understory vegetation, then the understory vegetation cover class was coded with a value that correlated to a value of "Not applicable/Not assigned." For example, if a tamarisk stand was mostly dead, but the living portion was a cover of 12 percent and the dead portion was a cover of 35 percent, it resulted in a shrub cover class value of "3" (>5 – 15%). Since the dead portion of the tamarisk stand and the living portion were dense enough that the ground beneath couldn't be evaluated, the herbaceous cover class resulted in a value of "9" (Not applicable/Not assigned).

2.6.3.3 Exotics

Photo interpreters assigned each existing polygon a code reflecting the level of impact by exotic invasive species such as Mediterranean grass *(Schismus spp.)* or tamarisk *(Tamarix spp.)*. Polygons were not created or split because of differences in the presence of exotics. **Table 4**, adapted from VegCAMP (2013), presents the map classes for Exotics.

Table 4: Map Classes for Exotics

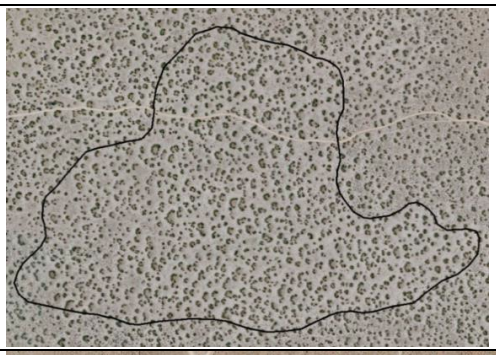
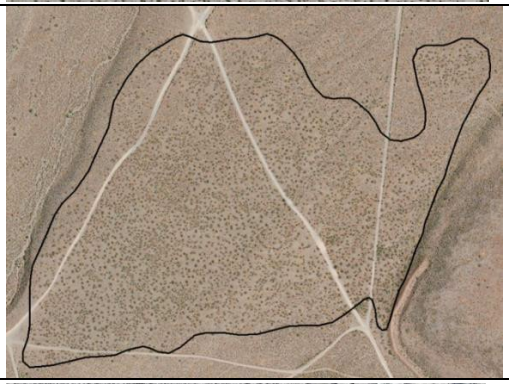
Code	Range	Discussion
0	None/Not observable	Sparse herbaceous vegetation with a minimal to low relative cover of exotic species; based on field data, no evidence of exotics in sampling, no evidence of exotics on imagery and based on modeling, assumed not present or not regular in the stand. This is expected on desert pavement, very steep bouldery slopes, and coarse rocky slopes, with no tawny or reddish *Schismus* spp. signature, etc.

Code	Range	Discussion
1	Patches of exotics visible, but cover not significant (relative cover to total <33%)	Sparse to moderate cover of herbaceous vegetation with a low to moderately high relative cover of exotic species. Patches of exotics are visible, but cover is not significant. *Larrea tridentata-Ambrosia dumosa* without high roadedness or degraded understory usually fall in this class. S*chismus* spp. or *Tamarix* spp. may be visible in relatively small discrete patches (less than half of the substrate signature), but do not present an extensive signature.
2	Exotics (particularly herbaceous) significant and cover may exceed dominant vegetation strata (relative cover <66%)	Exotics are significant and cover may exceed the dominant vegetation strata. A "haze" *of Schismus* spp. (tawny) is uniform in the understory of shrubby or tree overstory; or an ochre "haze" of *Brassica* spp. is found in sandy soil. Areas of higher disturbance are likely to be in this category.
3	Stand characterized by exotics (vegetation type is "exotic") (relative cover >66%)	This is reserved primarily for Alliance-level calls which are defined by exotics; stands are characterized by exotic vegetation (as defined by the map unit). Examples of this are stands of *Arundo donax* and *Tamarix* spp.
9	Not Applicable/Not Assigned	Exotics are not applicable when the MapUnit is 9230, 9300, 9310, 9320, 9800, 9801, 9803, 9804, 9805.

2.6.3.4 Roadedness Disturbance

Roadedness Disturbance is defined as the level of impact in a polygon by paved and unpaved roads, off highway vehicle (OHV) trails, railroads, berms, and covered aqueducts. Impact is defined by the proportion of any polygon that is contiguously without these features, as shown in **Table 5**. The table is adapted from VegCAMP (2013). Roads following polygon boundaries were not included in the assessment. Each existing vegetation polygon was assigned a Roadedness Disturbance class. Polygons were not created or split because of differences in roadedness.

Table 5: Map Classes for Roadedness Disturbance

Code	Range	Example
0	None/Not observable	Not applicable
1	Low: at least 2/3 (67% to 100%) of the vegetation polygon area is roadless	
2	Moderate: between 1/3 and 2/3 (33% to 66%) of the vegetation polygon is intersected by roads of any kind	
3	High: less than 1/3 (<33%) of the vegetation polygon lacks roads of any kind	
9	Not Applicable/Not Assigned	Roadedness is not applicable when the MapUnit is 9200, 9210, 9220, 9300, 9310, 9800, 9801, 9803, 9804, 9805.9310, 9800, 9801, 9802, 9803, 9804

The Roadedness Disturbance code reflects the combination of the expanse of roads in the polygon and the roads' effect on the contiguous space that has no roads – that is, where the roads fall within the polygon. This definition of roadedness has the advantage of helping to identify roadless areas, but the disadvantage of being scale independent. For example, any polygon with a road more or less bisecting it will be assigned a code of Moderate, regardless of size. This means that a very large polygon with a "Moderate" Roadedness Disturbance code might still contain an extensive roadless area.

2.6.3.5 Development Disturbance

Development Disturbance accounts for the level of impact by structures and settlements that are smaller than the MMU criteria for land use. Structures may include buildings, tanks, trailers, metal electrical towers, communication towers, and utility and mining structures. This attribute includes paved parking lots and collapsed structures. Note that it also includes debris such as junked vehicles, major trash dumping, etc., the removal of which could result in a vegetation stand that could be in very good to pristine ecological condition. Disturbance that does not involve these types of features is accounted for in Anthropogenically Altered Disturbance. Polygons were not created or split because of differences in Development Disturbance, but existing vegetation polygons were assigned a Development Disturbance class. **Table 6**, adapted from VegCAMP (2013), presents the map classes for Development Disturbance.

Table 6: Map Classes for Development Disturbance

Code	Range	Discussion
0	None/Not observable	There are no noticeable junk piles, isolated homes, structures, etc. within the polygon.
1	Low; less than 2% of polygon affected	Junk piles, structures, cement pads, etc. are inconsistently distributed at very low density.
2	Moderate; between 2% to 5% of the polygon affected	Multiple examples of dispersed junk, buildings, or other structures, etc. are visible throughout the polygon. There may be a dense concentration of development within a single or few parts of the vegetation polygon.
3	High; more than 5% of polygon affected	Multiple examples are evenly distributed in a vegetated polygon; typically meets the 2.5-acre threshold to map a "Built-up and Urban Disturbance" (9300) polygon. However, mines or open pits coded as 9300 may be assigned a Development Disturbance code of 0, 1, 2, or 3 depending on the amount of structures or debris present in the polygon.
9	Not Applicable/Not Assigned	Development Disturbance is not applicable when the MapUnit is 9200, 9210, 9220, 9801.

2.6.3.6 Anthropogenically Altered Disturbance

This indicates the level of impact on vegetation through tillage, scraping, mining, etc. Disturbance from structures, pavement, or debris is not included here but is addressed in Development Disturbance. Anthropogenically Altered Disturbance captures past disturbances in the landscape that are still visible through their impact on vegetation, but do not have enough of an impact to change the vegetation type or percent cover range. For example, striations from former cultivation may be present on parcels of land that have not been under agriculture for decades. Anthropogenically Altered Disturbance is typically bounded by a straight-line feature such as a fenceline or road, implying man-induced activity. Not included are small clearings caused by OHV traffic at road intersections, fire effects, and powerline tower pedestal clearings.

Polygons were not created or split because of differences in anthropogenically altered disturbance, but existing vegetation polygons were assigned one of the classes presented in **Table 7**, which was adapted from VegCAMP (2013).

Table 7: Map Classes for Anthropogenically Altered Disturbance

Code	Range	Discussion
0	None/Not observable	No ghost lines of tilling, differential effects of enclosure/exclosure fencing, effects of grazing/browsing, etc. are visible.
1	Less than 33% of polygon is affected and/or impact is seen but does not affect vegetation cover or type	Less than 1/3 of a vegetation polygon has visible evidence of clearing, prior agricultural activity or other effects.
2	Between 33% to 66% of polygon is affected	A vegetation polygon has more than 1/3 but less than 2/3 visible effects of clearing, prior agricultural or other effects.
3	More than 66% of polygon affected	A vegetation polygon has more than 2/3 visible effects of clearing, prior agricultural or other effects.
9	Not Applicable/Not Assigned	Anthropogenic alteration is not applicable when the MapUnit is 9801.

2.6.3.7 Altered Hydrologic Regime Modifier

This attribute denotes where a wash or sheet flow has been diverted from its natural path by restricted sheet flow or active channel flow crossing under a road, railroad, berm, etc., resulting in a vegetation difference downslope. The effect must create a boundary-forming break in vegetation type, tree cover, shrub cover, or herbaceous cover along the impediment. The modifier is only attributed to the polygon downslope of the impediment. The upslope portion on the polygon boundary must at least in part follow the hydrologic impediment. Drainage ditches conveying flow off the side of a road (though often visible on imagery) are not considered unless they make a boundary-forming break in the vegetation.

Examples of how impediments can result in an observable difference in vegetation type

or cover include: 1) washes have contracted or have been diverted or eliminated on the downslope side of the impediment, 2) natural sheet flow has been diverted, modified or eliminated on the downslope side, or 3) the impediment caused water from wash or sheet flow to be impounded upslope.

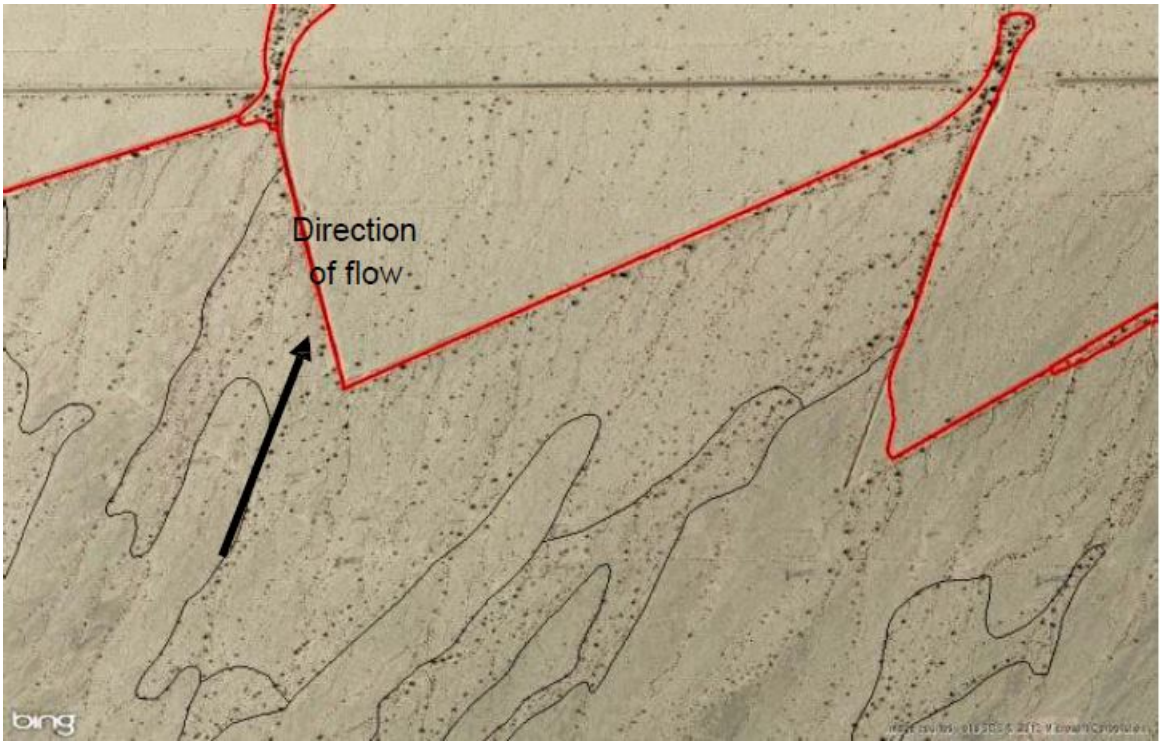
Since the Altered Hydrologic Regime Modifier was applied only where mappable changes in vegetation type or cover were observed across an impediment, an existing polygon was not split solely because part of it was subject to a diversion of surface flow. The map classes for Altered Hydrologic Regime Modifier are presented in **Table 8**.

Table 8: Map Classes for Altered Hydrologic Regime Modifier

Code	Definition	Discussion
0	Not Affected	Neither the vegetation type nor percent cover is affected by hydrologic impediment that follows a portion of polygon boundary.
1	Affected	Vegetation type and/or percent cover is affected by hydrologic impediment that follows polygon boundary. Only the polygon downslope from the impediment is considered affected.
9	Not Applicable/Not Assigned	Altered Hydrologic Regime Modifier is not applicable when the MapUnit is 9300, 9310, 9800, 9801, 9803, 9804, 9805.

Figure 6 presents an example of polygons coded with the Altered Hydrologic Regime Modifier. This example shows portions of polygons (in red above) which were assigned an Altered Hydrologic Regime Modifier. The embankments, the “V” shaped portions of the polygon, funnel sheet wash flow out of their natural channel into small diversion ditches. The resultant hydrologic modification changes the vegetation, in this example, from a series of *Olneya* washes upslope (south) to a sparse cover of *Larrea tridentata* with a widely scattered sparse emergent cover of *Olneya* (to the north).

Figure 6: Example of Polygons with the Altered Hydrologic Regime Modifier



2.6.3.8 Ironwood – Blue Palo Verde Presence Modifier (OLTE_PAFL)

This attribute denotes the consistent presence of ironwood *(Olneya tesota)* and/or blue palo verde *(Parkinsonia florida)* in mapped polygons within the study area, the only occurrence of which is in the Colorado Desert region of the Sonoran Desert. The modifier was added to represent the vast expanses of sparse ironwood and/or blue palo verde emerging from the canopy of creosote bush, white bursage, and brittle bush shrub types on broad alluvial fans and bajadas, as well as sparsely vegetated desert pavement dissected by small rivulets, where the vegetation type was not assigned to the Parkinsonia florida-Olneya tesota Alliance.

The photo interpreters determined whether the polygon contained a presence of either or both of the two key species. Although cover can be in trace amounts (below 1 percent), it must be consistent across most of the mapped polygon. All polygons mapped as the *Parkinsonia florida-Olneya tesota* Alliance also received the OLTE_PAFL modifier value of “1” (Present).

Figure 7 presents an example where the modifier was applied, and **Table 9** summarizes the map classes.

Figure 7: Example of Polygon with OLTE_PAFL Modifier

The image at left represents an example of a portion of a *Larrea tridentata – Ambrosia dumosa* Alliance polygon coded with the OLTE_PAFL modifier. *Olneya tesota* occurs consistently in the polygon as the larger, darker dots ranging in cover between 0.5 and 1 percent. By contrast, the image at right shows a *Parkinsonia florida – Olneya tesota* Alliance stand in a wash.

Table 9: Map Classes for OLTE_PAFL Modifier

Code	Definition	Discussion
0	Not visible/present	Mapped polygons do not have Olneya tesota or Parkinsonia florida present consistently throughout the stand in at least trace amounts.
1	Present	Mapped polygons have Olneya tesota or Parkinsonia florida present consistently throughout the stand in at least trace amounts.

2.6.3.9 Land Use

Land use is the human use of the land and is embodied through such features as urban centers, towns, mining, agriculture, and individual settlements. As mentioned in Section 2.6.3.1.2, in this mapping effort land use was represented both as a possible vegetation class and as a separate attribute of a vegetated polygon. Every attempt was made to correlate the coding within both layers. A land use polygon was mapped if it was at least 2.5 acres in size. The criteria used for mapping land use are presented in Appendix E.

The hierarchical format of the land use classification is such that more-detailed classes may be added at lower levels of the hierarchy for future more detailed land use mapping efforts. For example, the Urban (1000) class could be subdivided further into Residential (1100), Commercial (1200), Industrial (1300), Transportation/Communication (1400), and so on. The land use code assignment was mostly at an Anderson Level I (Anderson et al., 1972) with lower levels for specific categories, as shown below:

0000 = Not Assigned/Not Assessed
1000 = Urban
    1436 = Water Transfer (major canals, aqueducts and agricultural channels)
    1850 = Wildlife Preserves & Sanctuaries
2000 = Agriculture (Includes Nurseries)
    2100 = Non-woody Row & Field Crops
    2200 = Orchards & Vineyards
    2300 = Improved Pastureland (Irrigated)
3000 = Vacant Land
    3500 = Vacant Land - Restoration
9800 = Undifferentiated Water
    9810 = Water Improvement Feature (includes settling ponds, salt evaporators, sewage treatment ponds, recharge basins; may or may not contain water at time of imagery)

In this work effort, the definition of the 1436 land use code correlates to the Vegetation Type (MapUnit) code of “Major Canals and Aqueducts” (9804). The land use code of 1436 was also applied to mappable corridors in the agricultural areas of the Imperial Valley that contained one or more agricultural channels (on the topographic maps, these are often lateral drains that have been named). These corridors in the agriculture areas are coded with a Map Unit value of “Agriculture” (9200).

2.6.3.8 Method ID

This attribute was used to indicate how the MapUnit coding decision was reached for a polygon by identifying what type of field data (if any) was used to support the vegetation type assignment. For polygons that did not have any corresponding point data, the value of “photo interpretation” was assigned. The Method ID attribute facilitated the AA sample allocation process, as polygons that had reliable field information for type assignment could be identified and omitted from the final allocation.

The following is a list of the values used:

1 = Rapid Assessment (current project)
2 = Relevé (current project)
3 = Field Verification (current project)
4 = Photointerpretation
5 = Adjacent Stand Information or Ground Photo
6 = AIS Reconnaissance (current project)
7 = Other Information
8 = Older Plot Data/Other Agency Recent Plot Data)
9 = Older Recon Data &/or Other Agency Recon Data
10 = Accuracy Assessment (current project)
60 = Additional Recon Information/Inconsequential Project Field Info

2.6.4 Quality Control

Quality control was an iterative process, conducted at many phases of the mapping effort. For the entire duration of the project, photo interpreters consulted with one another as each module was mapped. This sharing of perspectives and examples ensured consistency in the mapping decisions made throughout the study area.

Completed modules were subjected to a series of automated checks. Any instances of invalid codes, uncoded polygons, adjoining polygons with the same code, or topology problems were flagged for correction by the photo interpreter. Another type of automated check verified that illogical combinations of codes were not used. For instance, a polygon coded as a Joshua tree type could not have a “None or Not observable” code in Percent Cover by Joshua Tree. Additionally, a manual visual quality control was conducted, with each photo interpreter reviewing his or her completed module for consistent application of codes and MMU considerations. When adjoining completed modules were edge-matched, any mapping discrepancies found at the edges between modules were corrected and, if necessary, changes were applied throughout the modules.

When all the modules in a subarea unit were joined together, a senior photo interpreter reviewed the data for quality of delineations, registration of linework to the base imagery, code accuracy, consistency of interpretations, adherence to the mapping criteria, and omissions in data capture. Automated final checks were again conducted for invalid codes and code attribute correlations. Topological errors were checked, as were any edge-match problems. Another round of quality control was conducted after AA results had been applied to each of the subarea units.

When edge-matching to previously mapped areas in the DRECP study, every effort was made to make the transition as seamless as possible. Occasionally discrepancies were encountered, so the following guidelines were established to handle them:

1. If the edge-match differences affect only a small polygon in the current project – minor offset in boundary placement preference, judgment call in code assignment, etc. – match the current project data to the previously mapped area.

2. If the edge-match difference is egregious (type differences) and is at the edge of the previously mapped area, which attaches to a large polygon in the current project, and the coding on the prior map would possibly be wrong for the current large polygon, then the data will intentionally be left not edge-matched and a comment placed in the Notes field of the polygon. Method ID was also left intentionally not edge-matched and placed a comment in the Notes field.

3. If the edge-match difference (i.e. cover breaks) impacts a large polygon, in either or both databases, in most cases it will be preferable to feather in a code change by adding a boundary in the current dataset using photo signature or a natural feature to create the break in close proximity to the study area boundary.

2.7 Accuracy Assessment

To validate the vegetation maps, an accuracy assessment (AA) was performed for each subarea. After AA of the last Delivery Area was completed, the results were combined for reporting of the project as a whole.

Polygons from the vegetation geodatabases were allocated for AA using a stratified random sampling, in which allocated polygons were distributed across the mapped units so that both rare and common types were represented. For the contracted subareas, CDFW staff provided in-kind time to allocate the accuracy assessment polygons. The sample allocation of polygons to select for visitation took the following parameters into consideration: land ownership, proximity to roads and trails (e.g., within 500 meters), other accessibility issues (e.g., slope steepness), and a targeted number of allocated polygons based on the number of vegetation types.

Using the field key and descriptions developed during classification analysis, field staff visited allocated polygons to determine the vegetation type, without knowledge of the polygon attribution. For a polygon to be validly assessed for accuracy, at least 20 percent of its area has to be viewed, however, usually greater than 50 percent of the area was viewed in the field. For each AA survey, the location of the survey was marked using a GPS device (i.e., iPad, Garmin), and ground photos were taken at the AA GPS location. The field staff provided a primary vegetation type call and a list of dominant plant species, along with percent cover estimates by species and by vegetation strata. If a polygon contained more than one mappable vegetation type, notes were provided for how the polygon should be divided, and a separate survey was taken for each type meeting the minimum map unit size. See Appendix F for the AA field form.

AA field data was entered into a standardized database developed by CDFW and CNPS. CDFW ecologists, independent from CNPS field and AIS mapping staff, scored the accuracy of the vegetation geodatabase based on a fuzzy logic method as used for existing DRECP mapping (VegCAMP 2013, Menke 2013) and the Survey of California Vegetation (VegCAMP 2020). CDFW staff reviewed each AA and removed from consideration any samples that had problems associated with access, vegetation identification, visibility, or significant changes in land use or vegetation since the date of the imagery on which the map was based. If the field crews could not identify the vegetation type based on the field key or incorrectly identified the type, CDFW staff assigned the correct type based on the species covers recorded in the AA data, any additional notes taken by the field crews, and sometimes the field photos.

AA scores were calculated by vegetation type and results were summarized in the form of a contingency table, so that specific and systematic errors could be addressed by the photo interpreters. Two forms of accuracy (User's and Producer's) can be estimated from the data (Story and Congalton 1986). User's accuracy provides an estimate of commission error, or how well spatial mapping data actually represents what is found on the ground; i.e., when the user goes to a location mapped as a certain class, the resulting probability that it is in fact that class is provided (with a percent accuracy). Producer's accuracy, on the other hand, measures omission error, or the probability that vegetation of a given class in the field is mapped as that class. Producer's accuracy may

inform the mappers how well a mapping class can be detected by the photo interpreters (Story and Congalton 1986, Lea and Curtis 2010). Both User's and Producer's accuracy were calculated.

A fuzzy logic method was used to score each AA survey, rather than simply denoting whether a sample was correct or incorrect (Congalton and Green 2009, Gopal and Woodcock 1994, Hagen 2003). Each field-verified polygon was scored according to a set of decision rules **(Table 10)**, with a total of 5 possible points for each. Scores were summed for each vegetation type, then divided by the total possible score and multiplied by 100 for a percent accuracy. Additionally, a total overall accuracy was calculated by counting the AA surveys that were deemed correct (score of 5, or 100%) or acceptable (score of 3 or 4, or 60% or 80% accurate), and then dividing that count by the total number of AA surveys scored across all vegetation types.

Table 10: Accuracy Assessment Scoring Rules and Points

Code	Reason for Score	Score
A	PI completely correct.	5
B	The PI chose the correct Group OR the next level up in the hierarchy.	4
C	Threshold/transition between PI (Producers') call and Final (Field assessed) call. This was used when cover values of the dominant or indicator species were close to the values that would key to the PI's type (e.g., an AA call of *Yucca brevifolia* Alliance for a stand with 1% evenly distributed *Yucca brevifolia* over *Larrea tridentata – Ambrosia dumosa* would get this score if the PI call was *Larrea tridentata – Ambrosia dumosa* Alliance with <1% *Yucca brevifolia*).	4
D	Correct at Macrogroup level OR next level up in hierarchy.	3

Code	Reason for Score	Score
E	Based on close ecological similarity. Ecological similarity addresses assessed and mapped calls that contained vegetation with overlapping diagnostic species but were not technically closely related in the NVCS hierarchy. This was common in stands that contain a mix of species of late and early seral vegetation types and also common in zones of overlap between ecoregions.	3
F	Correct at Division level (OR next level up in hierarchy).	2
G	Some floristic/hydrologic similarity. This addresses cases in which the mapped and the assessed vegetation type had different diagnostic species, but bear some similarity in ecological traits based on predicted and actual setting such as hydrologic regime, overall climate, or successional state.	2
H	Correct only at Lifeform, without any floristic similarity.	1
I	No similarity above Formation and incorrect life form.	0
J	Survey removed because there was a significant change in the polygon (e.g., the stand was burned, developed, or cleared since the date of the base imagery).	no score
K	Survey removed because inadequate portion (<20%) of the polygon was viewed by the field assessment.	no score
L	Survey removed because field/PI data are incomplete, inadequate or confusing (e.g., cover values were not provided for key species in the stand).	no score
M	Supplementary record not scored (for multiple point assessments within a polygon where the AA call was the same).	no score

Once a Delivery Area had been scored, the accuracy assessment results were reviewed by senior photo interpreters. In some cases, the photo interpreter flagged a specific AA finding for follow-up discussion and review with the AA ecologist staff, resulting in either accepting, modifying the AA call, or eliminating the AA point out of the analysis. Once AA review was completed, any types not achieving 80% accuracy were further evaluated in consultation between the ecologists and mapping staff. The photo interpreters then revised the polygons based on the AA results. Therefore, the final map product is better than the stated accuracy.

CHAPTER 3: Results

This section presents results for the classification development, vegetation mapping effort, and the accuracy assessment.

3.1 Floristic Classification

For the two subareas, CNPS staff collected 34 new surveys in the Searles Valley area and 37 new surveys in the West Mojave Trails A area in the spring of 2019. Staff then compiled over 1,880 other samples along these new surveys to develop a comprehensive classification for the region. The classification analysis and mapping resulted in recognizing approximately 28 alliances and 56 associations within the Searles Valley and West Mojave Trails A subareas including a 1 km buffer. See **Table 11** for a summary of the classification units at the alliance level. Since some of the alliance-level classification units were too difficult for photo interpreters to map at that finer scale, sometimes higher-level groups or macrogroups were mapped instead of alliances (e.g., North American warm desert dunes and sand flats Group instead of *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Alliance).

Upon developing this classification, CNPS edited an existing field key to vegetation types of the DRECP region (See Appendix G). Vegetation alliance and association descriptions were written (See Appendix H) for local types within a 5 km buffer of project areas, based on the compiled vegetation sampling data from the region. Most of the units that were mapped have local descriptions, and the MCV online includes fuller statewide descriptions (see https://vegetation.cnps.org).

This classification provided updates to the statewide alliance definitions, including the following: *Castela emoryi* Association was combined into the *Ephedra californica – Ephedra trifurca* Alliance, *Bebbia juncea* Association was combined into a mixed Alliance of *Ambrosia salsola – Bebbia juncea* Alliance, three mid-elevation mixed desert scrub Alliances were merged together into the *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance, and two riparian wooded-scrub alliances were merged into the *Chilopsis linearis – Psorothamnus spinosus* Alliance. The classification also resulted in defining of new Alliance or Association concepts, including a calcareous rocky type of *Amphipappus fremontii – Salvia funerea* Alliance and a new *Aliciella latifolia – Nama pusillum – Phacelia rotundifolia* (Provisional) Association in the *Chorizanthe rigida – Geraea canescens* Desert Pavement Alliance.

Table 11. Vegetation Classification (Organized by Lifeform at the Alliance Level) in the Searles Valley (SV) and West Mojave Trails A (WMTA) Subareas.

Vegetation Types with Surveys Collected from the Subareas are noted in the Classification and Descriptions (Class.-Desc.) column.

Life- form	Map Unit	Vegetation Type	SV	WMTA	Class. Desc.
Woodland & Forest Types					

	7222	*Chilopsis linearis – Psorothamnus spinosus* Alliance		Y	Y
	4227	*Parkinsonia florida – Olneya tesota* Alliance		Y	
	4222	*Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Alliance	Y	Y	Y
Shrubland Types					
	3721	*Allenrolfea occidentalis* Alliance	Y		Y
	4226	*Acacia (=Senegalia) greggii – Hyptis emoryi – Justicia californica* Alliance	Y	Y	Y
	4111	*Ambrosia dumosa* Alliance	Y	Y	Y
	7211	*Ambrosia salsola – Bebbia juncea* Alliance	Y	Y	Y
	5444	*Amphipappus fremontii – Salvia funerea* Alliance		Y	Y
	5112	*Atriplex confertifolia* Alliance	Y		Y
	4113	*Atriplex polycarpa* Alliance	Y	Y	Y
	4229	*Castela emoryi* Association		Y	
	5211	*Encelia (actoni, virginensis) – Viguiera reticulata* Alliance	Y		Y
	4114	*Encelia farinosa* Alliance		Y	Y
	4211	*Ephedra californica – Ephedra trifurca* Alliance		Y	
	5419	*Ephedra nevadensis - Lycium andersonii - Grayia spinosa* Alliance	Y	Y	Y
	4213	*Ericameria paniculata* Alliance	Y	Y	Y
	2221	*Eriogonum fasciculatum – (Viguiera parishii)* Alliance	Y	Y	Y
	4115	*Larrea tridentata - Ambrosia dumosa* Alliance	Y	Y	Y
	4118	*Larrea tridentata - Encelia farinosa* Alliance	Y	Y	Y
	4119	*Larrea tridentata* Alliance	Y	Y	Y
	4212	*Lepidospartum squamatum* Alliance		Y	Y
	6118	*Peucephyllum schottii – Pleurocoronis pluriseta* Alliance	Y	Y	Y
	7212	*Prunus fasciculata – Salazaria mexicana* Alliance	Y		Y
	5511	*Sarcobatus vermiculatus* Alliance	Y		Y
	7411	*Suaeda moquinii – Isocoma acradenia* Alliance	Y		Y
	5424	*Yucca schidigera* Alliance		Y	Y
Herbaceous Types					
	3726	*Distichlis spicata* Alliance	Y	Y	Y
	3416	*Typha (angustifolia, domingensis, latifolia)* Alliance	Y	Y	Y
	3410	Arid West freshwater emergent marsh Group	Y		
	2305	California annual & perennial grassland (Native component) Mapping Unit		Y	

	3700	Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup	Y		
Sparsely Vegetated Types					
	6111	*Atriplex hymenelytra* Alliance	Y	Y	Y
	6117	*Chorizanthe rigida - Geraea canescens* Desert Pavement Alliance	Y	Y	Y
	6113	Mud Hills sparsely vegetated ephemeral herbs Mapping Unit	Y		
	6110	North American warm desert bedrock cliff and outcrop Group	Y		
	6120	North American warm desert dunes and sand flats Group	Y		
	6116	Sparsely vegetated playa (Ephemeral annuals) Mapping Unit	Y		
	6114	Unvegetated wash and river bottom Mapping Unit	Y		
Disturbance Types					
	9320	Anthropogenic Areas of Little or No Vegetation Mapping Unit	Y	Y	
	9300	Built-up & Urban Disturbance Mapping Unit	Y	Y	

3.2 Mapping

The final map contains 111 types that were mapped, composed of 75 Alliances and Alliance-level types such as Provisional Alliances, Semi-natural Alliances, and Mapping Units; 9 Associations, and 15 Miscellaneous Classes relating to features such as agriculture, water, and urban disturbance; and 12 upper-level hierarchical types, such as Class, Subclass, Macrogroup and Group. When the photo interpreter could not confidently classify a polygon at the alliance level, the polygon was assigned a broader upper-level code. This was most common with herbaceous communities, whose differences at the alliance level are often not readily discernible on imagery. Each map unit is described in Appendix B; the map classification is presented in Appendix A; and a summary table of polygon counts and acreage by map unit is presented in Appendix C.

A total of 1,821,092 acres were mapped, with a total of 92,942 polygons. For area (including acreage), and polygon counts by vegetation type for the study area, refer to Appendix C.

3.3 Accuracy Assessment

The AA data collection for the subareas was conducted at different times by CNPS staff, based on when AIS produced the draft vegetation maps. The locations, timing, and number of AA field surveys are summarized below in **Table 12;** 129 AA surveys were used in the scoring of the 131 collected. The AAs were stand-based, in which both the vegetation type and the extent of the polygon were evaluated when possible. When a mapped polygon could be divided due to the presence of more than one vegetation type within the given MMU standards, an assessment was done for each type (i.e., a polygon sometimes had more than one AA survey). Also, the survey point locations are displayed in **Figures 8** and **9** below.

Table 12: Locations and Dates for AA Field Surveys

Location	Dates for AA Field Surveying	No. of AA Surveys Collected	No. of Surveys Scored	No. of Polygons Scored
Searles Valley	October 2021	83	82	79
West Mojave Trails A	November 2021	48	47	47

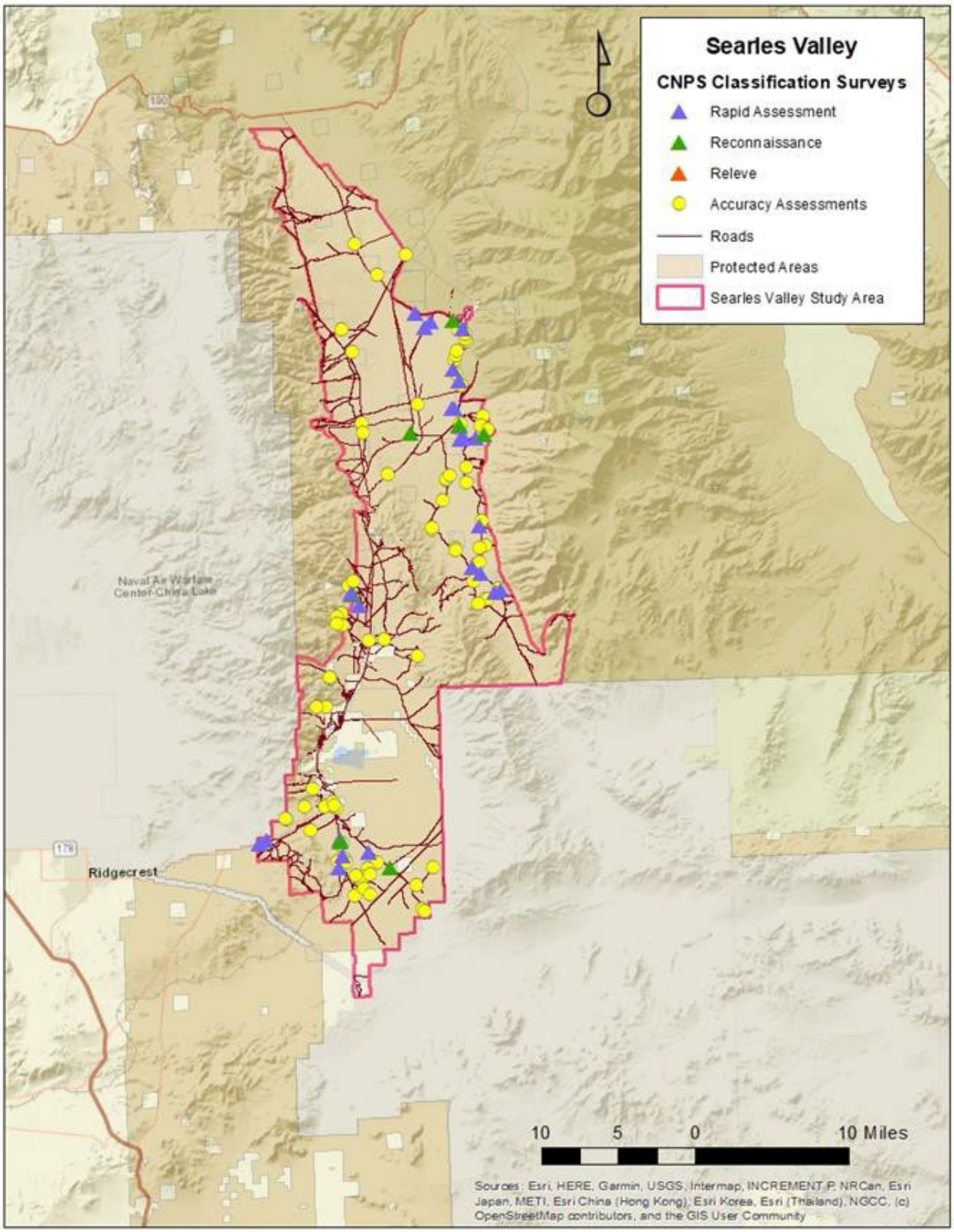


Figure 8: Map of the Classification and the AA Survey Locations for Searles Valley Subarea

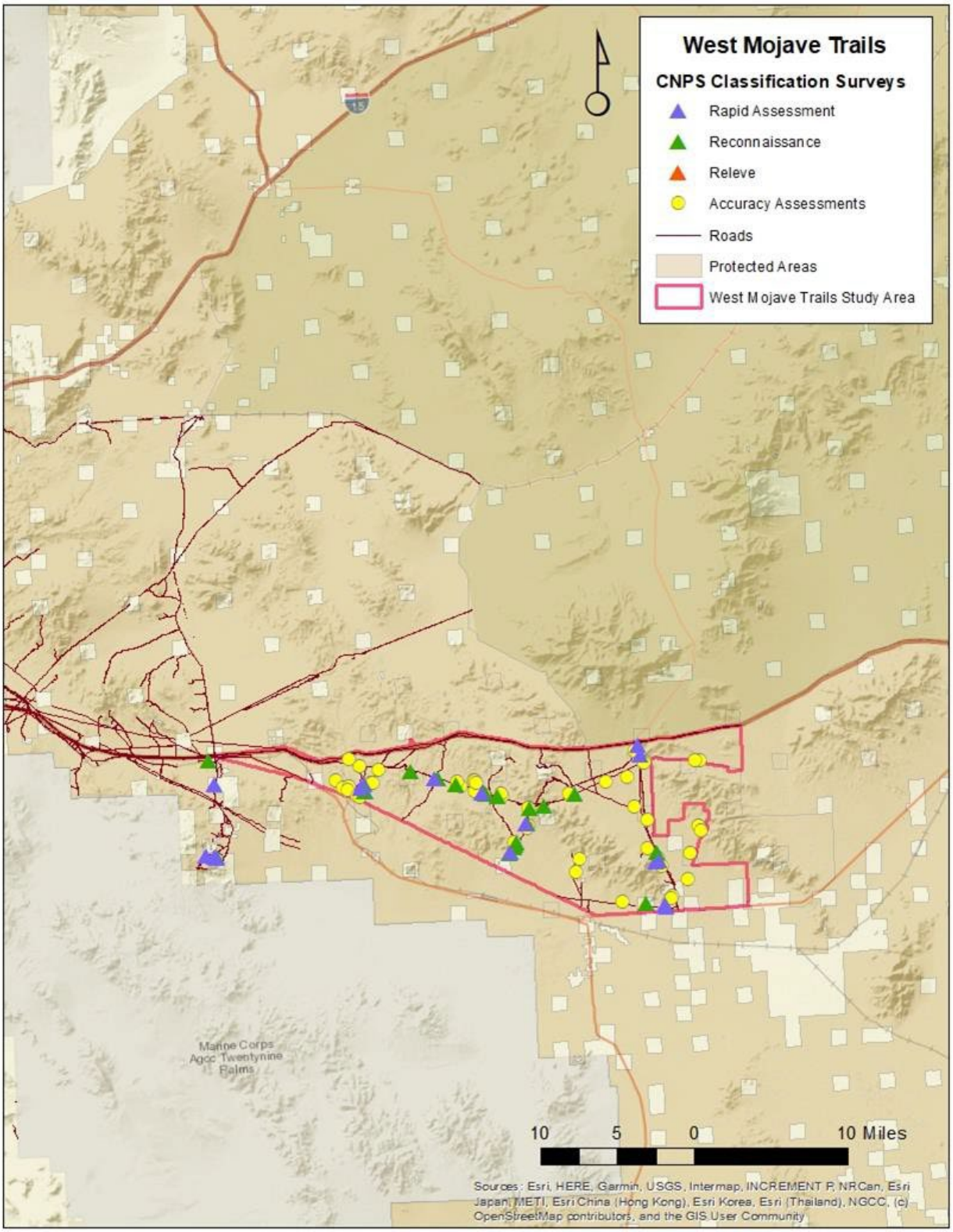


Figure 9: Map of the Classification and the AA Survey Locations for West Mojave Trails A Subarea

The AA field data were analyzed by CDFW-VegCAMP staff to verify accuracy of the vegetation maps. The resulting percent accuracy calculated for each area was greater than 80% overall. The overall Fuzzy Accuracy Assessment ratings for the final vegetation map at the alliance and group levels were 93 percent. Tables with AA scores for the study area is provided in **Table 13** below.

Also, contingency tables displaying assessed types by users (Field assessed types) and producers (PI mapped types) for this accuracy assessment are included in Appendix I. Each column in the table represents a type assessed in the field for each polygon (users), while each row represents the type mapped by the photo interpreters (producers). Numbers on the diagonal are correct calls by the photo interpreters. These contingency tables display the numbers of assessed polygons by type, and do not include fuzzy scores.

Table 13. Accuracy Assessment Scores for the Searles Valley and West Mojave Trails A Subareas

Alliance Name	Users' Score (%)	Users' Count	Producers' Score (%)	Producers' Count
Acacia greggii (=Senegalia) – Hyptis emoryi – Justicia californica Alliance	100	2	83	6
Allenrolfea occidentalis Alliance	100	8	93	12
Ambrosia dumosa Alliance	80	6	77	6
Ambrosia salsola – Bebbia juncea Alliance	77	8	95	4
Atriplex confertifolia Alliance	100	1	90	2
Atriplex hymenelytra Alliance	87	6	91	7
Atriplex polycarpa Alliance	90	6	92	5
Chilopsis linearis – Psorothamnus spinosus Alliance	98	12	98	12
Chorizanthe rigida – Geraea canescens Desert Pavement Sparsely Vegetated Alliance	97	8	100	7
Encelia farinosa Alliance	95	4	100	3

Alliance Name	Users' Score (%)	Users' Count	Producers' Score (%)	Producers' Count
Ephedra californica Alliance	100	5	97	6
Ericameria paniculata Alliance	90	6	82	9
Larrea tridentata – Ambrosia dumosa Alliance	93	9	100	6
Larrea tridentata – Encelia farinosa Alliance	100	6	100	6
Larrea tridentata Alliance	70	2	85	4
Lepidospartum squamatum Alliance	100	1	67	3
Mud Hills sparsely vegetated ephemeral herbs Mapping Unit	100	7	97	8
Peucephyllum schottii – Pleurocoronis pluriseta Alliance	100	2	80	3
Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Alliance	97	7	100	6
Psorothamnus fremontii – Psorothamnus polydenius Alliance	80	1		
Sparsely vegetated playa Mapping Unit	92	10	100	6
Suaeda moquinii – Isocoma acradenia Alliance	84	9	92	5
Unvegetated wash and river bottom Mapping Unit	100	3	100	3
Overall polygon count		129		

Alliance Name	Users' Score (%)	Users' Count	Producers' Score (%)	Producers' Count
Polygons with 60-100% Accuracy (Score 3 or above)		124		
Polygons with 80-100% Accuracy (Score 4 or above)		119		
Fuzzy Overall Percent Accuracy	93			

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GLOSSARY

Term	Definition
Alliance	a vegetation classification unit of low rank (7th level) containing one or more associations, and defined by a characteristic range of species composition, habitat conditions, physiognomy, and diagnostic species, typically at least one of which is found in the uppermost or dominant stratum of the vegetation (Jennings *et al*. 2006). Alliances reflect regional to subregional climate, substrates, hydrology, moisture/nutrient factors, and disturbance regimes.
Bajada	an alluvial plain formed at the base of a mountain by the coalescing of several alluvial fans.
Bosque	in arid climates, an oasis-like ribbon of canopied vegetation that only exists near rivers, streams, or other water courses.
Chenopod	any plant of the goosefoot family; common in deserts and especially in saline or alkaline soils. Examples include *Allenrolfea, Atriplex, Grayia, Krascheninnikovia, Salicornia, Salsola, Sarcobatus*, and *Suaeda.*
Cismontane	refers to the portion of Southern California on the coastal side of the Transverse and Peninsular mountain ranges. The term “Southern California” often refers to this region specifically. See also **“transmontane”.**
Colluvial	referring to loose earth material that has accumulated at the base of a hill through the action of gravity.
Cove (on a hillside)	a hollow or recess in a mountain; a narrow pass or sheltered area between woods or hills.
Cryptobiotic crust	a layer on the surface of desert soils composed of biotic organisms such as blue-green algae, lichens, mosses, green algae, microfungi, and bacteria.
Decadent	(botany) a plant that is dead or dying.
Defile	a narrow passage, especially between mountains.

Desiccation the state of being thoroughly dried up.

Endorheic of or pertaining to interior drainage basins (basins that don't drain to the ocean).

Edaphic related to or caused by particular soil conditions, as of texture or drainage, rather than by physiographic or climatic factors.

Facultative having the capacity to live under more than one specific set of environmental conditions - as opposed to "obligate".

Fluvial of or pertaining to a river; produced by or found in a river.

Geodatabase a database designed to store, query, and manipulate geographic information and spatial data.

Group a vegetation classification unit of intermediate rank (6th level) defined by combinations of relatively narrow sets of diagnostic plant species (including dominants and co-dominants), broadly similar composition, and diagnostic growth forms that reflect biogeographic differences in mesoclimate, geology, substrates, hydrology, and disturbance regimes (cf. Pignatti *et al*. 1994, Specht and Specht 2001).

Hummocky relating to any topographic surface characterized by rounded or conical mounds.

Hydrophobic (soil) a condition in which water collects on the soil surface rather than infiltrating into the ground. Wildfires generally cause soils to be hydrophobic temporarily.

Intermontane a feature between mountains, such as a plateau or a basin.

Lens a body of rock or ore that is thick in the middle and thinner toward the edges, similar in shape to a biconvex lens.

Lithomorphic pertaining to a soil with a shallow profile, with organic soil horizons directly overlying bedrock.

Macrogroup a vegetation classification unit of intermediate rank (5th level) defined by combinations of moderate sets of diagnostic plant species and diagnostic growth forms that reflect biogeographic

differences in composition and sub-continental to regional differences in mesoclimate, geology, substrates, hydrology, and disturbance regimes (cf. Pignatti *et al*. 1994).

Mesic of, pertaining to, or adapted to an environment having a balanced supply of moisture.

Microphyll a type of small leaved tree/community adapted to arid deserts.

Panne a shallow depression or flat that is often unvegetated and can have encrustations of salt left by evaporation.

Phenology the science dealing with the influence of climate on the recurrence of such annual phenomena of plant life as budding and other growth phases.

Playa the sandy, salty, or mud-caked flat floor of a desert basin having interior drainage, usually occupied by a shallow lake during or after prolonged, heavy rains.

Pool and swale topography landscape characterized by shallow depressions where water can collect seasonally (pools), and long, narrow, shallow, troughs or depressions that may slope downward (swales).

Premontane pertaining to an elevation zone corresponding to foothills or lower mountain slopes.

Psammophytic a plant that grows in sand or sandy soil.

Rhizomatous a plant producing rhizomes, which are root-like subterranean stems, commonly horizontal in position, that usually produce roots below and send up shoots progressively from the upper surface.

Scald a hard impermeable surface on saline or sodic soils as a result of wind or sheet erosion (dry scald) or by surface sealing through deposition of salts and clays following evaporation of surface water (wet scald).

Scleroph-yllous typically scrub, but also forest, in which the leaves of the trees and shrubs are evergreen, hard, thick, leathery, and usually small. A

dominant plant form in hot dry areas, especially Mediterranean-type climates.

Seral referring to a community that is an intermediate stage in ecological succession, preceding the climax community.

Signature the visual characteristics of objects on an aerial photograph that allow one to differentiate them. The characteristics include tone, shape, size, pattern, texture, and shadow.

Stoloniferous producing or bearing stolons, which are prostrate stems, at or just below the ground surface, that produce new plants from buds at their tips or nodes.

Transmontane refers to the largely desert areas of Southern California, on the noncoastal side of the Transverse and Peninsular mountain ranges. See also “**cismontane**”.

List of Acronyms

Acronym	Phrase
AA	Accuracy Assessment
AFB	Air Force Base
AIS	Aerial Information Systems, Inc.
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife (name changed 1/1/13)
CEC	California Energy Commission
DRECP	Desert Renewable Energy Conservation Plan
DEM	Digital Elevation Model
DRG	Digital Raster Graphics
FGDC	Federal Geographic Data Committee
GIS	Geographic Information System
GPS	Global Positioning System
MMU	Minimum Mapping Unit
MMW	Minimum Mapping Width
NAIP	National Agricultural Imagery Program
NAWS	Naval Air Weapons Station
NVCS	National Vegetation Classification Standards
OHV	Off-Highway Vehicle
OHVP	Off-Highway Vehicle Park
PI	Photointerpretation, photo interpreter
ROW	Right-of-way
USGS	US Geological Survey
VegCAMP	Vegetation Classification and Mapping Program

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DRG	Digital Raster Graphics
FGDC	Federal Geographic Data Committee
GIS	Geographic Information System
GPS	Global Positioning System
MMU	Minimum Mapping Unit
MMW	Minimum Mapping Width
MOLA	Modoc-Lassen
NAIP	National Agricultural Imagery Program
NVCS	National Vegetation Classification Standards
OHV	Off-Highway Vehicle
OHVP	Off-Highway Vehicle Park
PI	Photointerpretation, photo interpreter
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USGS	US Geological Survey
VegCAMP	Vegetation Classification and Mapping Program

APPENDIX A-1: DRECP-WIDE MAPPING CLASSIFICATION – Hierarchy 9/30/2023

Vegetation Type (Map Unit)

NOTES:

^ indicates a map unit that was added for the Owens Lake portion of DRECP study area (mapped for BLM) (4-12-18)

* indicates a map unit that was added for the Salton Sea portion of DRECP study area (mapped for BLM) (4-17-18)

@ indicates a map unit that was added or name was updated for the Jawbone (North and South) portion of DRECP study area (mapped for BLM) (~10/2018 or later)

% indicates new code resulting from classification analysis and key update 12-7-18 through 5/7/2019 by CNPS/CDFW

$ indicates new code resulting from classification analysis and key update 6-16-20 by CNPS

<Not in key and/or never mapped>

xxxx = Upland MMU 10-acre desert/1-acre non-desert (no highlight)

xxxx = Special MMU 1-acre desert/¼-acre non-desert area

xxxx = Land Use MMU 2.5-acre

1000 = TEMPERATE FOREST SUBCLASS

- 1100 = California Forest and Woodland Macrogroup MG009
    - 1110 = Californian broadleaf forest and woodland Group
        - *1111 = Quercus douglasii (Blue oak woodland) Alliance*
        - *1112 = Quercus lobata (Valley oak woodland) Alliance*
        - *1113 = Quercus chrysolepis (Canyon live oak forest) Alliance*
        - *1114 = Quercus wislizeni (Interior live oak woodland and chaparral) Alliance*
        - *1115 = Juglans californica (California walnut groves) Alliance <Never mapped>*
        - *1116 = Aesculus californica (California buckeye groves) Allianc*
        - *1117 = Quercus agrifolia (Coast live oak woodland and forest) Alliance*
        - *@1118 = Quercus kelloggii (California black oak forest) Alliance*
    - 1120 = Californian evergreen coniferous forest and woodland Group
        - *1121 = Pinus sabiniana (Foothill pine woodland) Alliance*
        - *1122 = Juniperus californica (California juniper woodland) Alliance*

1123 = Pinus coulteri (Coulter pine woodland) Alliance <Never mapped>

- **1200 = Californian-Vancouverian Montane and Foothill Forest Macrogroup MG023 (Southern Vancouverian Montane & Foothill Forest Macrogroup M023)**
    - 1210 = Californian montane conifer forest Group
        - *1211 = Pseudotsuga macrocarpa (Bigcone Douglas-fir forest) Alliance*
        - *1212 = Abies concolor (Sierran white fir forest) Alliance <Not in key, never mapped>*
        - *1213 = Pinus jeffreyi (Jeffrey pine forest) Alliance*
        - *1214 = Pinus lambertiana (Sugar pine forest) Alliance <Not in key, never mapped>*

- **1300 = Intermountain Basins Pinyon-Juniper Woodland Macrogroup MG026**
    - 1310 = Western Great Basin montane conifer woodland Group
    - *1311 = Pinus monophylla (Singleleaf pinyon woodland) Alliance*
    - *1312 = Juniperus occidentalis (Western Juniper woodland) Alliance <Not in key, never mapped>*
- **1400 = Southwestern North American Riparian, Flooded and Swamp Forest Macrogroup MG036 (Warm Mediterranean & Desert Riparian, Flooded & Swamp Forest Macrogroup)**
    - 1410 = Southwestern North American riparian evergreen and deciduous woodland Group
        - *1411 = Populus fremontii – Fraxinus velutina – Salix gooddingii (Fremont cottonwood – Velvet ash – Black willow forest) Alliance [name change]*
        - *1412 = [moved to 1416]*
        - *1413 = [moved to 1416]*
        - *1414 = Platanus racemosa (California sycamore woodlands) Alliance*
        - *1415 = Washingtonia filifera (California fan palm oasis) Alliance*
            - *Washingtonia filifera – Platanus racemosa / Salix spp. Association (14151)*
            - *Washingtonia filifera / spring (Atriplex – Baccharis – Pluchea) Association (14152)*
        - *%1416 = Salix gooddingii – Salix laevigata (Black willow – Red willow thickets) Alliance*
            - *Salix laevigata (Red willow forest) Association [formerly Alliance] (1412)*
            - *Salix gooddingii (Black willow forest) Association Unit [formerly Alliance] (1413)*
    - 1420 = Southwestern North American riparian/wash scrub Group
        - *1421 = [moved to 1423]*
        - *1422 = Baccharis salicifolia (Mulefat thickets) Alliance*
        - *1423 = Baccharis emoryi – Baccharis sergiloides (Emory's and Broom baccharis thickets) Alliance [name change]*

        - *Baccharis emoryi (Emory's baccharis thickets) Provisional Association [formerly Alliance] (1421) <Never mapped>*
      - *1424 = Salix exigua (Sandbar willow thickets) Alliance*
      - *1425 = Rhus trilobata – Crataegus rivularis – Forestiera pubescens (Basket bush – River hawthorn – Desert olive patches) Alliance [name change]*
      - *1426 = Sambucus nigra (Blue elderberry stands) Alliance*
      - *1427 = Salix lasiolepis (Arroyo willow thickets) Alliance*
      - *@1428 = Vitis arizonica – Vitis girdiana (Wild grape shrubland) Alliance*
  - 1430 = Southwestern North American introduced riparian scrubland and herbaceous Group
    - *1431 = Phragmites australis – Arundo donax (Common reed – Giant reed breaks) Semi-natural Stands [name change]*
    - *1432 = Tamarix spp. (Tamarisk thickets) Semi-natural Stands 1433 = Saccharum ravennae (Ravennagrass) Semi-natural Stands [formerly Mapping Unit]*
    - *%1434 = Phoenix dactylifera – Washingtonia filifera (Date palm – California fan palm) Semi-natural Stands <Never mapped>*

- **1500 = Western Cordilleran Montane-Boreal Riparian Scrub and Forest Macrogroup MG034 (Rocky Mountain & Great Basin Flooded & Swamp Forest Macrogroup)**
  - 1510 = Vancouverian riparian deciduous forest Group
    - *1511 = Alnus rhombifolia (White alder groves) Forest Alliance*
    - *^1512 = Populus trichocarpa (Black cottonwood forest)* Alliance
  - ^1520 = Great Basin montane riparian shrub Group (Western montane-subalpine riparian seep shrubland Group)
    - *^1521 = Betula occidentalis (Water birch thicket) Alliance*
    - *^1522 = Cornus sericea – Rosa woodsii – Ribes spp. (Red osier – Interior rose – Gooseberry thickets) Alliance [name change, formerly provisional]*

- **^1600 = Introduced North American Mediterranean Woodland and Forest Macrogroup MG027**
  - **^**1610 = Introduced North American Mediterranean woodland and forest Group
  - ^1611 = *Eucalyptus* spp. – *Ailanthus altissima – Robinia pseudoacacia (Eucalyptus – Tree of heaven – Black locust groves)* Semi-natural Alliance

- **$1800 = Southern Rocky Mountain Lower Montane Forest Macrogroup M022**
    - **$1810 = Southern Rocky Mountain White Fir – Douglas-fir Dry Forest Group**
        - *$1811 = Abies concolor Dry (White fir dry forest) Alliance*

2000 = MESOMORPHIC SHRUB AND HERB CLASS

- **2100 = California Chaparral Macrogroup MG043**
    - 2110 = Californian xeric chaparral Group
        - *2111 = Arctostaphylos glauca (Bigberry manzanita chaparral) Alliance*
        - *2112 = Adenostoma fasciculatum (Chamise chaparral) Alliance*
        2113 = Ceanothus crassifolius (Hoary leaf ceanothus chaparral) Alliance
        - *2114 = [moved below to 3316]*
        - *2115 = Adenostoma fasciculatum – Salvia mellifera (Chamise – Black sage chaparral) Alliance*
        - *@2116 = Ceanothus cuneatus (Wedgeleaf ceanothus chaparral) Alliance*
        - *@2117 = Arctostaphylos viscida (Whiteleaf manzanita chaparral) Alliance*
    - 2120 = Californian mesic and pre-montane chaparral Group [name change]
        - *2121 = Arctostaphylos glandulosa (Eastwood manzanita chaparral) Alliance*
        - *2122 = [moved to 2123 below]*
        - *%2123 = Ceanothus oliganthus – Ceanothus leucodermis (Hairy leaf ceanothus – Chaparral whitethorn chaparral) Alliance*
            - *Ceanothus leucodermis (Chaparral whitethorn chaparral) Association [formerly Alliance] (2122)*
    - 2130= [combined with 2120] <Code never mapped>
        - *2131 = Cercocarpus montanus (Birchleaf mountain mahogany chaparral) Alliance*
        - *2132 = Quercus berberidifolia (Scrub oak chaparral) Alliance*
        Quercus berberidifolia – Adenostoma fasciculatum (Scrub oak – Chamise chaparral) Association [formerly Alliance] (2133)
        - *2134 = Prunus ilicifolia – Heteromeles arbutifolia (Holly leaf cherry – Toyon chaparral) Alliance [name change]*

- **2200 = California Coastal Scrub Macrogroup MG044**
    - 2210 = Central and south coastal California seral scrub Group
        - *2211 = Gutierrezia californica (California match weed patches) Provisional Alliance <Never mapped>*
        - *2212 = [moved to 7520 below]*
        - *2213 = [moved to 7520 below]*

        - *2214 = Ericameria linearifolia – Cleome isomeris (Narrowleaf goldenbush – bladderpod scrub) Alliance [name change]*
        - *2215 = [moved to 7520 below]*
        - *2216 = Malacothamnus fasciculatus – Malacothamnus spp. (Bush mallow scrub) Alliance <never mapped>*
        - *2217 = Corethrogyne filaginifolia – Eriogonum (elongatum, nudum) (Sand-aster – Perennial* buckwheat fields) *Alliance [name change]*
            - *Corethrogyne filaginifolia (Common sand-aster scrub) Association [formerly Alliance] (2218)*
            - *%Lupinus excubitus – Menzelia albicaulis – Eriogonum spp. (Grape soda lupine – White blazingstar – Annual buckwheat) Association (2219)*
        - *%7520 = Lotus scoparius – Lupinus albifrons – Eriodictyon spp. (Deer weed – Silver bush lupine – Yerba santa scrub) Alliance*
            - *Lotus scoparius (Deer weed scrub) Association [formerly Alliance] (2212)*
            - *Lupinus albifrons (Silver bush lupine scrub) Association [formerly Alliance] (2213)*
            - *Eriodictyon (crassifolium, trichocalyx) (Thick leaf and hairy yerba santa scrub) Provisional Association [formerly Alliance] (2215)*
            - *Dendromecon rigida (Bush poppy scrub) Association [formerly Alliance] (5216)*
    - 2220 = Central and South Coastal Californian coastal sage scrub Group
        - *2221 = [moved to 4150s]*
        - *2222 = Eriogonum wrightii – Eriogonum heermannii – Buddleja utahensis (Wright's buckwheat – Heermann's buckwheat – Utah butterfly bush patches) Alliance [name change]*
        - *2223 = Salvia mellifera (Black sage scrub) Alliance <Never mapped>*
        - *2224 = Keckiella antirrhinoides (Bush penstemon scrub) Alliance <Not in key, never mapped>*
        - *2225 = Artemisia californica (California sagebrush scrub) Alliance <Never mapped>*
        - *@2226 = Eriogonum fasciculatum (California buckwheat scrub) Alliance (cismontane)*

- **2300 = California Annual and Perennial Grassland Macrogroup MG045**
    - *2305 = California annual and perennial grassland (Native component) Mapping Unit*
    - 2310 = California annual forb/grass vegetation Group
        - *2311 = Eschscholzia (californica) – Lupinus (nanus) (California poppy – Sky lupine fields) Alliance [name change]*
        - *2312 = Amsinckia (menziesii, tessellata) – Phacelia spp. (Fiddleneck – Phacelia fields) Alliance [name change]*

        - *2313 = Lasthenia californica – Plantago erecta – Vulpia microstachys (California goldfields – Dwarf plantain – Six-weeks fescue flower fields) Alliance*
        - *2314 = Monolopia (lanceolata) – Coreopsis (calliopsidea) (Monolopia and Tickseed flower fields) Alliance <Never mapped>*
            - *%Coreopsis bigelovii – Layia glandulosa – Menzelia spp. (Bigelow's tickseed – Whitedaisy tidytips – Blazingstar fields) Association (2316)*
        - *2315 = Plagiobothrys nothofulvus (Popcorn flower fields) Alliance <Never mapped>*
    - 2320 = California perennial grassland Group
        - *2321 = [moved to 2322]*
        - *2322 = Nassella spp. – Melica spp. (Needlegrass – Melic grass grassland) Alliance [name change]*
            - *Nassella cernua (Nodding needle grass grassland) Association [formerly Provisional Alliance] (2321)*
            - *Nassella pulchra (Purple needle grass grassland) Sub-alliance (2323)*
    - 2330 = Mediterranean California naturalized annual and perennial grassland Group
        - *2331= Brassica tournefortii – Malcolmia africana (Upland desert mustards) Semi-natural Stands*
        - *2332= Bromus rubens – Schismus (arabicus, barbatus) (Red brome or Mediterranean grass grasslands) Semi-natural Stands <Never mapped>*
        - *2333 = Lolium perenne (Perennial rye grass fields) Semi-natural Stands <Never mapped>*
        - *2334 = Pennisetum setaceum (Fountain grass swards) Semi-natural Stands <Never mapped>*

3000 = TEMPERATE AND BOREAL SHRUBLAND AND GRASSLAND SUBCLASS

- **3100 = Western North American Temperate Grassland and Meadow Macrogroup MG048**
    - 3110 = Vancouverian and Rocky Mountain naturalized annual grassland Group (Great Basin & Intermountain Ruderal Shrubland and Grassland Group)
        - *3111 = Bromus tectorum – Taeniantherum caput-medusae (Cheatgrass – Medusahead grassland) Semi-natural Stands [name change] <Never mapped>*
        - *%3112 = Isatis tinctoria – Salsola tragus (Dyers woad – Prickly Russian thistle Ruderal annual forb meadow) Semi-natural Stands <Never mapped>*

- 3120 = Western dry upland perennial grassland Group
  - *3121= [Moved to 3122]*
  - *3122 = Aristida purpurea – Elymus elymoides – Poa secunda (Purple three-awn – Squirreltail – Curly blue grass grassland) Alliance [name change] <Never mapped>*
    - *Elymus multisetus (Big squirreltail patches) Association (3121) <Not in key, Never mapped>[formerly Provisional Alliance]*

- **3200 = Western Cordilleran Montane Shrubland and Grassland Macrogroup MG049 (Southern Rocky Mountain Montane Grassland and Shrubland Macrogroup)**
  - 3210= Western Cordilleran montane deciduous scrub Group (Northern Rocky Mountain Montane-Foothill Mesic Deciduous Shrubland Group)
    - *3211 = Ribes quercetorum (Oak gooseberry thickets) Provisional Alliance*
    - *%3212 = Ceanothus cordulatus – Ceanothus integerrimus (Mountain whitethorn – Deer brush chaparral) Alliance*
      - *%Ceanothus integerrimus (Deer brush chaparral) Association (3213)*
  - 3220 = Western Cordilleran montane moist graminoid meadow Group
    - *3221 = Poa secunda – Muhlenbergia richardsonis – Carex douglasii (Onesided bluegrass – Mat muhly – Douglas' sedge meadows) Alliance [name change] [formerly Provisional]*

- **3300 = Warm Interior Chaparral Macrogroup MG051**
  - 3310 = Western Mojave and Western Sonoran Desert borderland chaparral Group
    - *3311 = [moved to 3316]*
    - *3312 = Quercus john-tuckeri (Tucker oak chaparral) Alliance*
    - *3313 = [moved to 3314]*
    - *3314 = Quercus cornelius-mulleri (Muller oak chaparral) Alliance Quercus palmeri (Palmer oak chaparral) Association*
      - *[formerly Alliance] (3313)*
    - *3315 = Adenostoma sparsifolium (Redshank chaparral) Alliance <Not in key, never mapped>*
    - *%3316 = Ceanothus greggii – Fremontodendron californicum (Cupleaf ceanothus – Flannelbush chaparral) Alliance*
      - *Ceanothus greggii (var. vestitus, perplexans) (Cup leaf ceanothus chaparral) Association [formerly Alliance] (3311)*
      - *Fremontodendron californicum (Flannelbush scrub) Association [formerly Alliance] [moved from another part of hierarchy] (2114)*

- 3320 = Mogollon Rim chaparral Group
  - 3321 = *Rhus ovata (Sugarbush chaparral) Alliance <Not in key, never mapped>*
  - *$3322 = Quercus turbinella (Sonoran scrub oak chaparral) Alliance*

- **3400 = Western North American Freshwater Marsh Macrogroup MG073**
  - 3410 = Arid West freshwater emergent marsh Group
    - *3411 = [moved to 3415]*
    - *3412 = Schoenoplectus (acutus, californicus) (Hardstem bulrush, California bulrush marshes) Alliance [formerly Mapping Unit]*
      - *Schoenoplectus acutus (Hardstem bulrush marsh) Association [formerly Alliance] (3413) <Never mapped>*
      - *Schoenoplectus californicus (California bulrush marsh) Association [formerly Alliance] (3414)*
    - *@3416 = Typha (angustifolia, domingensis, latifolia) (Cattail marshes) Alliance*
      - *Phragmites australis ssp. americanus (American common reed marshes) Association [formerly Alliance] (3411)*
      - *Typha (angustifolia, domingensis, latifolia) (Cattail marshes) Mapping Unit [formerly Alliance] (3415) <Not in key>*
- **3500 = Western North America Vernal Pool Macrogroup MG074**
  - 3510 = Californian mixed annual/perennial freshwater vernal pool/swale/plain bottomland Group
    - *3511 = Deinandra fasciculata (Clustered tarweed fields) Alliance <Never mapped>*
    - *3512 = Cressa truxillensis – Distichlis spicata (Alkali weed – Saltgrass playas and sinks) Alliance [formerly Mapping Unit]*
      - *<Never mapped>*
      - *$Cressa truxillensis – Endolepis covillei (Alkali weed – Colville's endolepis) Provisional Association (3513)*

- **3600 = Western North America Wet Meadow and Low Shrub Carr Macrogroup MG075 (Western North America Montane & Subalpine Wet Shrubland & Wet Meadow Macrogroup)**
  - 3610 = Californian warm temperate marsh/seep Group
    - *3611 = Juncus arcticus (var. balticus, mexicanus) (Baltic and Mexican rush marshes) Alliance*
    - *3612 = Leymus cinereus – Leymus triticoides (Ashy ryegrass – Creeping ryegrass turfs) Alliance [name change] <Never mapped>*
    - *3613 = Muhlenbergia rigens (Deer grass beds) Alliance <Never mapped>*
    - *$3614 = Mimulus (guttatus) (Monkey flower seeps) Alliance*
  - 3620 = Naturalized warm-temperate riparian and wetland Group
    - *3716 = Crypsis schoenoides (Swamp Timothy) Mapping Unit <Not in key, never mapped>*

- **3700 = Warm Semi-Desert/Mediterranean Alkali–Saline Wetland Macrogroup MG083**
    - 3710= Southwestern North American alkali marsh/seep vegetation Group
        - *3711 = [moved to 3712]*
        - *3712 = Sporobolus airoides – Muhlenbergia asperifolia – Spartina gracilis (Alkali sacaton – Scratchgrass – Alkali cordgrass meadow) Alliance [name change]*
            - *Spartina gracilis (Alkali cordgrass meadow) Association [formerly Alliance] (3711)*
        - *3713 = Anemopsis californica – Helianthus nuttallii – Solidago spectabilis (Yerba mansa – Nuttall's sunflower – Nevada goldenrod meadow) Alliance [name change]*
        - *3714 = [moved to 3726 below]*
        - *3715 = Bolboschoenus maritimus, Schoenoplectus americanus (Salt marsh bulrush, American bulrush marshes) Mapping Unit <Not in key>*
        - *%3717 = Bolboschoenus maritimus (Salt marsh bulrush marsh) Alliance <Never mapped>*
        - *%3718 = Schoenoplectus americanus (American bulrush marsh) Alliance <Never mapped>*
        - *3716 = [moved to 3620]*
        - *3719 = Eleocharis (palustris, rotellata) (Alkaline spikerush marsh) Alliance*
    - 3720 = Southwestern North American salt basin and high marsh Group
        - *3721 = Allenrolfea occidentalis (Iodine bush scrub) Alliance*
        - *3722 = Atriplex lentiformis (Quailbush scrub) Alliance*
        - *3723 = Atriplex spinifera (Spinescale scrub) Alliance*
        - *3724 = Frankenia salina (Alkali heath marsh) Alliance*
        - *3725 = [moved to 7411]*
        - *3726 = Distichlis spicata (Salt grass flats) Alliance*
            - *%Distichlis spicata – Scirpus nevadensis (Saltgrass – Nevada bulrush) Alkaline Association <Never mapped>*
            - *Juncus cooperi (Cooper's rush marsh) Association [formery Alliance] (3714)*
        - *3727 = Salicornia depressa (Pickleweed flats) Herbaceous Alliance <Never mapped>*
        - *3728 = [moved to 7411]*
        - *3729 = [moved to 5511 below]*
        - *%7411 = Suaeda moquinii – Isocoma acradenia (Bush seepweed – Alkali goldenbush scrub) Alliance*
            - *Isocoma acradenia (Alkali goldenbush scrub) Association [formerly Alliance] (3728)*
            - *Suaeda moquinii (Bush seepweed scrub) Mapping Unit [formerly Alliance] (3725)*

- **%3800 = Vancouverian Coastal Dune and Bluff Macrogroup**
    - %3810 = California Coastal evergreen bluff and dune scrub Group
        - *%3811 = Frangula californica (California coffee berry scrub) Alliance*
          <Not in key, never mapped>

4000 = WARM SEMI-DESERT SCRUB AND GRASSLAND SUBCLASS

- **4100 = Mojavean–Sonoran Desert Scrub Macrogroup MG088**
    - 4110 = Lower bajada and fan Mojavean–Sonoran desert scrub Group
        - *4111 = Ambrosia dumosa (White bursage scrub) Alliance*
        - *4113 = Atriplex polycarpa (Allscale scrub) Alliance*
        - *4114 = Encelia farinosa (Brittle bush scrub) Alliance*
        - *4115 = Larrea tridentata – Ambrosia dumosa (Creosote bush – White bursage scrub) Alliance*
        - *4118 = Larrea tridentata – Encelia farinosa (Creosote bush – Brittle bush scrub) Alliance*
        - *4119 = Larrea tridentata (Creosote bush scrub) Alliance*
          4121 = [moved to 6111 below]
        - *4122 = Pleuraphis rigida (Big galleta shrub-steppe) Alliance*
        - *4123 = [moved to 7211 below]*
        - *4124 = Cylindropuntia bigelovii (Teddy bear cholla patches) Alliance*
            - *4125 = [moved to 5430]*
    - 4150 = Arizonan upland Sonoran desert scrub Group
        - *4151 = [moved to 2221 below]*
        - *4152 = Carnegiea gigantea – Parkinsonia microphylla – Prosopis velutina (Saguaro – Foothill palo verde – Velvet mesquite desert scrub) Alliance*
        - *4153 = Prunus fremontii (Desert apricot scrub) Alliance*
        - *2221 = Eriogonum fasciculatum – Viguiera parishii (California buckwheat – Parish's goldeneye scrub) Alliance (desert) [moved in hierarchy,name change]*
            - *Viguiera parishii (Parish's goldeneye scrub) Association [formerly Alliance] (4151)*
        - *$4154 = Agave deserti (Desert agave scrub) Alliance*
        - *$4155 = Simmondsia chinensis (Jojoba scrub) Alliance*
    - $4160 = Mojavean upper desert scrub Group
        - *$4161 = Cylindropuntia acanthocarpa / Pleuraphis rigida (Buckhorn cholla / Big galleta grass scrub) Alliance*

- **4200 = Madrean Warm Semi-Desert Wash Woodland/Scrub Macrogroup MG092**
  - 4210 = Mojavean semi-desert wash scrub Group
    - *4211 = Ephedra californica – Ephedra trifurca (California joint fir – Longleaf joint-fir scrub) Alliance [name change]*
      - *Castela emoryi – Ephedra californica (Crucifixion thorn – California joint fir) Association [formerly Special Stands] (4229) [name change]*
    - *4212 = Lepidospartum squamatum (Scale broom scrub) Alliance*
    - *4213 = Ericameria paniculata (Blackstem rabbitbrush scrub) Alliance*
    - *4214 = [moved to 7212]*
    - *4215 = [moved to 7211]*
    - *4216 = [moved to 7211]*
    - *4217 = [moved to 5311 below]*
    - *4218 = [moved to 7211]*
    - *^4219 = Psorothamnus fremontii – Psorothamnus polydenius (Fremont's and Nevada smokebush scrub) Alliance*
      - *Psorothamnus schottii (Schott's indigo bush*) Association [formerly Alliance] *(4231) <Not mapped>*
    - *%7211 = Ambrosia salsola – Bebbia juncea (Cheesebush – Sweetbush scrub) Alliance*
      - *Brickellia desertorum (Desert brickellbush scrub) Association [formerly Alliance] (4123) <Never mapped>*
      - *Brickellia incana (Woolly brickellia wash scrub) Provisional Association [formerly Provisional Alliance] (4215)*
      - *Ambrosia salsola (Cheesebush scrub) Mapping Unit [formerly Alliance] (4216)*
      - *Bebbia juncea (Sweetbush scrub) Association [formerly Provisional Alliance] (4218)*
      - *Senna armata Association*
    - *%7212 = Prunus fasciculata – Salazaria mexicana (Desert almond – Bladder sage scrub) Alliance*
      - *Prunus fasciculata (Desert almond scrub) Sub-alliance [formerly Alliance] (4214)*
      - *Salazaria mexicana (Bladder sage scrub) Association [formerly Alliance] (5415)*
      - *$7213 = Fallugia paradoxa (Apache plume scrub) Alliance*
  - 4220 = Sonoran-Coloradan semi-desert wash woodland/scrub Group
    - *4221 = Pluchea sericea (Arrow weed thickets) Alliance*
    - *4222 = Prosopis glandulosa – Prosopis velutina – Prosopis pubescens (Mesquite bosque, mesquite thicket) Alliance [name change]*
    - *4224 = [moved to 7222 below]*
    - *4225 = [moved to 7222 below]*

        - *4226 = Acacia greggii – Hyptis emoryi – Justicia californica (Catclaw acacia thorn – Desert lavender – Chuparosa scrub) Alliance [name change]*
            - *Hyptis emoryi (Desert lavender scrub) Association [formerly Alliance] (4228)*
            - *Tetracoccus hallii – Acacia greggii (Hall's shrubby spurge – Catclaw acacia patches) Association (7223)*
        - *4227 = Parkinsonia florida – Olneya tesota (Blue palo verde – ironwood woodland) Alliance*
            - *Parkinsonia florida / Hyptis emoryi Association (42271) 4228 = [moved to 4226]*
        - *4229 = [moved to 4211]*
        - *%7222 = Chilopsis linearis – Psorothamnus spinosus (Desert willow – Smoke tree woodland) Alliance*
            - *Chilopsis linearis (Desert willow woodland) Association [formerly Alliance] (4224)*
            - *Psorothamnus spinosus (Smoke tree woodland) Association [formerly Alliance] (4225)*
    - *4230 = Sonoran-Coloradan semi-desert wash woodland/scrub Group (continued) [USE 4220 for Group level code]
        - **4231 = [moved to 4219]*

5000 = COOL SEMI-DESERT SCRUB AND GRASS SUBCLASS

- **5100 = Cool Semi-Desert Alkali-Saline Flats Macrogroup MG093**
    - 5110 = Shadscale-saltbush cool semi-desert scrub Group
        - *5111 = Atriplex canescens (Fourwing saltbush scrub) Alliance 5112 = Atriplex confertifolia (Shadscale scrub) Alliance*
- **5200 = Cool Semi-desert wash and disturbance scrub Macrogroup MG095**
    - 5210 = Intermontane seral shrubland Group
        - *5211 = Encelia (actoni, virginensis) – Viguiera reticulata (Acton's and Virgin River brittlebush – Net-veined goldeneye scrub) Alliance [name change]*
        - *5212 = Ericameria nauseosa (Rubber rabbitbrush scrub) Alliance 5214 = Gutierrezia sarothrae – Gutierrezia microcephala (Snake*
            - *weed scrub) Provisional Alliance [name change] 5215 = [moved to 5419 below]*
        - *5216 = [moved to 7520 (2210s)]*
        - *%5217 = Ericameria nauseosa – Atriplex lentiformis (Rubber rabbitbrush – Quailbush scrub) Mapping Unit*

- **5300 = Western North America Tall Sage Shrubland and Steppe Macrogroup MG096**
  - 5310 = Inter-Mountain West mesic tall sagebrush shrubland and steppe Group
    - *5311 = Artemisia tridentata (Big sagebrush) Alliance Artemisia tridentata ssp. parishii (Parish's sagebrush)*
      - *Provisional Association [formerly Provisional Alliance] (4217) [moved in hierarchy]*
    - *$5312 = Artemisia tridentata spp. vaseyana (Mountain big sagebrush) Alliance*

- **5400 = Inter-Mountain Dry Shrubland and Grassland Macrogroup MG098**
  - 5410 = Intermontane deep or well-drained soil scrub Group
    - *5411 = [moved to 5419]*
    - *5412 = Krascheninnikovia lanata (Winterfat scrubland) Alliance 5413 = moved to 5419]*
    - *5414 = [moved to 5419]*
    - *5415 = [moved above to 7212 (4210s)]*
    - *5416 = Ericameria teretifolia (Needleleaf rabbitbrush scrub) Alliance 5417 = Ephedra viridis (Mormon tea scrub) Alliance*
    - *5418 = [moved to 5419]*
    - *^5419 = Ephedra nevadensis - Lycium andersonii - Grayia spinosa (Nevada joint fir - Anderson's boxthorn - Spiny hop sage scrub) Alliance*
      - *Ephedra nevadensis – Ericameria cooperi (Nevada joint fir – Cooper's goldenbush scrub) Association*
      - *Ericameria cooperi (Cooper's goldenbush scrub) Provisional Association [formerly Alliance](5215)*
      - *Grayia spinosa (Spiny hop sage scrub) Sub-alliance [formerly Alliance] (5411)*
      - *Ephedra nevadensis (Nevada joint fir scrub) Sub-alliance [formerly Alliance] (5413)*
      - *Lycium andersonii (Anderson's boxthorn scrub) Sub-alliance [formerly Alliance] (5414)*
      - *Lycium cooperi (Cooper's boxthorn scrub) Provisional Association [formerly Provisional Alliance] (5418)*
  - 5420 = Mojave and Great Basin upper bajada and toeslope Group
    - *5421 = Coleogyne ramosissima (Black brush scrub) Alliance*
    - *5422 = Purshia tridentata – Artemisia tridentata (Bitter brush – Big sagebrush scrub) Alliance [name change]*
    - *5423 = Yucca brevifolia (Joshua tree woodland) Alliance 5424 = Yucca schidigera (Mojave yucca scrub) Alliance 5425 = Menodora spinescens (Greenfire scrub) Alliance*
  - 5430 = Southern Great Basin semi-desert grassland Group
    - *5431 = Achnatherum speciosum (Desert needlegrass grassland) Alliance*

- *5432 = Pleuraphis jamesii (James' galleta shrub-steppe) Alliance*
  - *<Not mapped>*
- *5433 = Achnatherum hymenoides (Indian rice grass grassland) Alliance*
- *$5434 = Sporobolus cryptandrus – Aristida purpurea var. longiseta – Poa secunda (Sand dropseed – Red three-awn – Curly blue grass grassland) Alliance*
- *4125 = Sphaeraicea (ambigua, coccinea, parvifolia) (Desert globemallow scrub) Alliance <Never mapped>*

▪ 5440 = Intermountain shallow/calcareous soil scrub Group
- *5441 = Cercocarpus ledifolius (Curl leaf mountain mahogany scrub) Alliance*
- *5442 = Purshia stansburiana (Stansbury cliff rose scrub) Alliance*
- *%5443 = Cercocarpus intricatus (Small leaf mountain mahogany scrub) Alliance <Not mapped>*
- *$5444 = Amphipappus fremontii – Salvia funerea (Fremont's chaffbush – woolly sage scrub) Alliance*

o **5500 = Cool Semi-Desert Alkali-Saline Wetlands Macrogroup MG082**

▪ 5510 = Great Basin cool semi-desert alkali basin Group
- *5511 = Sarcobatus vermiculatus (Greasewood scrub) Alliance Atriplex parryi (Parry's saltbush scrub) Association [former*
  - *Provisional Alliance] (3729) [moved in hierarchy]*
  - Chrysothamnus albidus (White-flower Rabbitbrush scrub) Association <Not mapped>

o **$5600 = Western North America Dwarf Sage Shrubland & Steppe Macrogroup MG097**

▪ **$5610 = Intermountain Low Sage Shrubland & Steppe Group**
- *$5611 = Artemisia arbuscula spp. arbuscula (Little sagebrush scrub) Alliance*
- *$5612 = Artemisia nova (Black sagebrush scrub) Alliance*

6000 = NORTH AMERICAN WARM SEMI-DESERT CLIFF, SCREE AND ROCK VEGETATION DIVISION

- **6100 = North American Warm Semi-Desert Cliff, Scree, and Other Rock Vegetation Macrogroup MG117**
  - 6110 = North American warm desert bedrock cliff and outcrop Group
    - *6111 = Atriplex hymenelytra (Desert holly scrub) Alliance*
      - *Tidestromia oblongifolia – Atriplex hymenelytra (Arizona honey sweet – Desert holly scrub) Association [formerly Provisional Alliance] 4121) <Never mapped>*
    - *6112 = Ephedra funerea (Death Valley joint fir scrub) Alliance 6113 = Mud Hills sparsely vegetated ephemeral herbs Mapping Unit*
    - *6114 = Unvegetated wash and river bottom Mapping Unit*

        - *6115 = Massive sparsely vegetated rock outcrop Mapping Unit*
            - *%6119 = Aloysia wrightii – Pericome caudata – Ephedra nevadensis (Organillo – Tailed pericome – Nevada joint fir scrub) Sparsely Vegetated Cliff & Rock Outcrop Alliance <Never mapped>*
        - *6116 = Sparsely vegetated playa (Ephemeral annuals) Mapping Unit*
        - *6117 = Chorizanthe rigida – Geraea canescens (Spiny herb – Desert gold) Desert Pavement Sparsely Vegetated Alliance*
        - *6118 = Peucephyllum schottii – Pleurocoronis pluriseta (Desert fir – Bush arrowleaf scrub) Alliance [name change]*
    - 6120 = North American warm desert dunes and sand flats Group
        - *6121 = Dicoria canescens – Abronia villosa – Panicum urvilleanum (Desert dunes) Alliance [name change]*
            - *Panicum urvilleanum (Desert panic grass patches) Association [formerly Alliance] (6122)*
            - *Wislizenia refracta (Spectacle fruit) Association [formerly Special Stands] (6123)*
            - *$(Dicoria canescens) – Salsola tragus ((Twinbugs) – Prickly Russian thistle) Association (6124)*
- **$6200 = Intermountain Basins Cliff, Scree & Badland Sparse Vegetation Macrogroup MG118**
    - $6210 = Intermountain basins cliff, scree & badland sparse vegetation Group
        - *%7111 = Ephedra viridis – Chrysothamnus viscidiflorus – Rhus trilobata (Mormon tea – Sticky-flowered rabbitbrush – Basket bush scrub) Talus Sparse Scrub Alliance*
            - *<Never mapped>*

9000 = MISCELLANEOUS CLASSES

- 9200 = Agriculture
    - 9210 = Woody Agriculture (orchards, vineyards)
    - 9220 = Non-woody Row and Field Agriculture
    - ^9230 = Irrigated Pastures

- 9300 = Built-up & Urban Disturbance
    - 9310 = Urban Window
    - 9320 = Anthropogenic Areas of Little or No Vegetation

- ^9400 = Restoration

- 9500 = Exotic Trees

- 9700 = Burn Areas <Never mapped>
    - %9701 = Sparsely Vegetated Recently Burned Areas

- 9800 = Water

- 9801 = Perennial Stream Channel (Open Water)
- 9803 = Small Earthen-dammed Ponds and Naturally Occurring Lakes 9804 = Major Canals and Aqueducts (Open Water)
- 9805 = Water Impoundment Feature

Other Attributes

Percent of Cover by Conifers

- 0 = None or Not Observable
- 1 = >0-1%
- 2 = >1-5%
- 3 = >5-15%
- 4 = >15-25%
- 5 = >25-50%
- 6 = >50-75%
- 7 = >75-100%
- 9 = Not Applicable/Not Assigned

Percent of Cover by Joshua Tree

- 0 = None or Not observable
- 1 = >0-1%
- 2 = >1-5%
- 3 = >5%
- 9 = Not Applicable/Not Assigned

Percent of Cover by Hardwoods

- 0 = None or Not Observable
- 1 = >0-1%
- 2 = >1-5%
- 3 = >5-15%
- 4 = >15-25%
- 5 = >25-50%
- 6 = >50-75%
- 7 = >75-100%
- 9 = Not Applicable/Not Assigned

Percent of Cover by Shrub

- 0 = None or Not Observable
- 1 = >0-1%
- 2 = >1-5%
- 3 = >5-15%
- 4 = >15-25%
- 5 = >25-50%
- 6 = >50-75%
- 7 = >75-100%
- 9 = Not Applicable/Not Assigned

Percent of Cover by Herbaceous

- 1 = None, Not Observable, 0-2%
- 2 = >2-15%
- 3 = >15-40%
- 4 = >40-100%
- 9 = Not Applicable/Not Assigned

Percent of Cover by Trees

- 0 = None or Not Observable
- 1 = >0-1%
- 2 = >1-5%
- 3 = >5-15%
- 4 = >15-25%
- 5 = >25-50%
- 6 = >50-75%
- 7 = >75-100%
- 9 = Not Applicable/Not Assigned

Exotics

- 0 = None/Not Observable
- 1 = Low
- 2 = Moderate
- 3 = High
- 9 = Not Applicable/Not Assigned

Roadedness Disturbance

- 0 = None/Not Observable
- 1 = Low (>2/3 contiguous roadless)
- 2 = Moderate (1/3 - 2/3 contiguous roadless)
- 3 = High (<1/3 contiguous roadless)
- 9 = Not Applicable/Not Assigned

Development Disturbance

- 0 = None/Not Observable
- 1 = Low (>0 - 2% of polygon affected)
- 2 = Moderate (>2% - 5% of polygon affected)
- 3 = High (>5% of polygon affected)
- 9 = Not Applicable/Not Assigned

Anthropogenically Altered Disturbance

- 0 = None/Not Observable
- 1 = Low (>0% – 33% of polygon affected)
- 2 = Moderate (>33% – 66% of polygon affected)
- 3 = High (>66% of polygon affected)
- 9 = Not Applicable/Not Assigned

Altered Hydrologic Regime Modifier

- 0 = Not Affected
- 1 = Affected
- 9 = Not Applicable/Not Assigned

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.

Land Use

- 0 = Not Assigned/Not Assessed
- 1000 = Urban
- 1436 = Water Transfer (Major Canals, Aqueducts and Agricultural Channels)
- 1850 = Wildlife Preserves & Sanctuaries
- 2000 = Agriculture (Includes Nurseries)
- 2100 = Non-woody Row & Field Crops
- 2200 = Orchards & Vineyards
- ^2300 = Improved Pastureland (Irrigated)
- ^3500 = Vacant Land- Restoration 9800 = Undifferentiated Water
- 9810 = Water Impoundment Feature

Method_ID

- 1 = Rapid Assessment (current project)
- = Releve (current project)
- = Field Verification
- = Photointerpretation
- = Adjacent stand information or photo
- = Reconnaissance (current project)
- = Other information
- = Older plot data
- = Older recon data
- = Accuracy Assessment
- 60 = Additional Recon Information

OlTe-PaFl (Ironwood – Blue Palo Verde Presence Modifier)

- 0 = *Olneya tesota and/or Parkinsonia florida* not visible or not consistent in stand
- 1 = *Olneya tesota and/or Parkinsonia florida* present in at least trace amounts and consistent throughout most of the stand

APPENDIX A-2: Alphabetic List of Alliances in Vegetation Databases by Lifeform

Trees

- *Chilopsis linearis – Psorothamnus spinosus* Alliance (7222)
- *Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Alliance (4222)

Shrubs

- *Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226)
- *Allenrolfea occidentalis* Alliance (3721)
- *Ambrosia dumosa* Alliance (4111)
- *Ambrosia salsola – Bebbia juncea* Alliance (7211)
- *Atriplex confertifolia* Alliance (5112)
- *Atriplex polycarpa* Alliance (4113)
- *Cylindropuntia acanthocarpa / Pleuraphis rigida* Alliance (4161)
- *Encelia farinosa* Alliance (4114)
- *Ephedra californica – Ephedra trifurca* Alliance (4211)
- *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419)
- *Ericameria paniculatum* Alliance (4213)
- *Larrea tridentata* Alliance (4119)
- *Larrea tridentata – Ambrosia dumosa* Alliance (4115)
- *Larrea tridentata – Encelia farinosa* Alliance (4118)
- *Lepidospartum squamatum* Alliance (4212)
- Lower bajada and fan Mojavean-Sonoran desert scrub Group (4110)
- *Peucephyllum schottii – Pleurocoronis pluriseta* Alliance (6118)SV
  WMTA *Salix exigua* Alliance (1424)
- *Sarcobatus vermiculatus* Alliance (5511)
- *Suaeda moquinii – Isocoma acradenia* Alliance (7411)
- *Tamarix* spp. Semi-natural Stands (1432)
- *Yucca schidigera* Alliance (5424)

Herbaceous

- Arid West freshwater emergent marsh Group (3410)
- California annual and perennial grassland (Native component) Mapping Unit (2305)
- *Distichlis spicata* Alliance (3726)
- Mediterranean California naturalized annual and perennial grassland Group (2330)

Sparse Types

- *Atriplex hymenelytra* Alliance (6111)
- *Chorizanthe rigida – Geraea canescens* Desert Pavement Sparsely Vegetated Alliance (6117)
- Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113)
- North American warm desert bedrock cliff and outcrop Group (6110)
- North American warm desert dunes and sand flats Group (6120)
- *Peucephyllum schottii – Pleurocoronis pluriseta* Alliance (6118)
- Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116)
- Unvegetated wash and river bottom Mapping Unit (6114)

Miscellaneous Classes

- Built-up & Urban Disturbance (9300)
    - Anthropogenic Areas of Little or No Vegetation (9320)
- Water
    - Water Impoundment Feature (9804)

Other Attributes

Percent of Cover by Conifers

- 0 = None or Not Observable
- 1 = >0-1%
- = >1-5%
- = >5-15%
- = >15-25%
- = >25-50%
- = >50-75%
- = >75-100%
- = Not Applicable/Not Assigned

Percent of Cover by Joshua Tree

- 0 = None or Not Observable
- 1 = >0-1%
- = >1-5%
- = >5%
- 9 = Not Applicable/Not Assigned

Percent of Cover by Hardwoods

- 0 = None or Not Observable
- 1 = >0-1%
- = >1-5%
- = >5-15%
- = >15-25%
- = >25-50%
- = >50-75%
- = >75-100%
- = Not Applicable/Not Assigned

Percent of Cover by Shrub

- 0 = None or Not Observable
- 1 = >0-1%
- = >1-5%
- = >5-15%
- = >15-25%
- = >25-50%
- = >50-75%
- = >75-100%
- = Not Applicable/Not Assigned

Percent of Cover by Herbaceous

- 1 = None, Not Observable, 0-2%
- = >2-15%
- = >15-40%
- = >40-100%
- 9 = Not Applicable/Not Assigned

Percent of Cover by Trees

- 0 = None or Not Observable
- 1 = >0-1%
- = >1-5%
- = >5-15%
- = >15-25%
- = >25-50%
- = >50-75%
- = >75-100%
- = Not Applicable/Not Assigned

Exotics

- 0 = None/Not Observable
- 1 = Low
- = Moderate
- = High
- 9 = Not Applicable/Not Assigned

Roadedness Disturbance

- 0 = None/Not Observable
- 1 = Low (>2/3 contiguous roadless)
- = Moderate (1/3 - 2/3 contiguous roadless)
- = High (<1/3 contiguous roadless)
- 9 = Not Applicable/Not Assigned

Development Disturbance

- 0 = None/Not Observable
- 1 = Low (>0 - 2% of polygon affected)
- = Moderate (>2% - 5% of polygon affected)
- = High (>5% of polygon affected)
- 9 = Not Applicable/Not Assigned

Anthropogenically Altered Disturbance

- 0 = None/Not observable
- 1 = Low (>0% – 33% of polygon affected)
- = Moderate (>33% – 66% of polygon affected)
- = High (>66% of polygon affected)
- 9 = Not Applicable/Not Assigned

Altered Hydrologic Regime Modifier

- 0 = Not Affected
- 1 = Affected
- 9 = Not Applicable/Not Assigned

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.

Land Use

- 0 = Not Assigned/Not Assessed
- 1000 = Urban
- 1436 = Water Transfer (Major Canals, Aqueducts and Agricultural Channels)
- 1850 = Wildlife Preserves & Sanctuaries
- 2000 = Agriculture (Includes Nurseries)
- 2100 = Non-woody Row & Field Crops
- 2200 = Orchards & Vineyards
- ^2300 = Improved Pastureland (Irrigated)
- ^3500 = Vacant Land- Restoration
- 9800 = Undifferentiated Water
- 9810 = Water Impoundment Feature

Method_ID

- 1 = Rapid Assessment (current project)
- 2= Relevé (current project)
- 3= Field Verification
- 4= Photointerpretation
- 5= Adjacent stand information or photo
- 6= Reconnaissance (current project)
- 7= Other information
- 8= Older plot data
- 9= Older recon data
- 0= Accuracy Assessment

- 60 = Additional Recon Information

OlTe-PaFl (Ironwood – Blue Palo Verde Presence Modifier)

- 0 = *Olneya tesota and/or Parkinsonia florida* not visible or not consistent in stand
- 1 = *Olneya tesota and/or Parkinsonia florida* present in at least trace amounts and consistent throughout most of the stand

APPENDIX A-3: Numeric List of Alliances in Vegetation Databases by Lifeform

Trees

- 4222 = *Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Alliance
- 7222 = *Chilopsis linearis – Psorothamnus spinosus* Alliance

Shrubs

- 1424 = *Salix exigua* Alliance
- 1432 = *Tamarix* spp. Semi-natural Stands
- 3721 = *Allenrolfea occidentalis* Alliance
- 4110 = Lower bajada and fan Mojavean-Sonoran desert scrub Group
- 4111 = *Ambrosia dumosa* Alliance
- 4113 = *Atriplex polycarpa* Alliance 4114 = *Encelia farinosa* Alliance
- 4115 = *Larrea tridentata – Ambrosia dumosa* Alliance
- 4118 = *Larrea tridentata – Encelia farinosa* Alliance
- 4119 = *Larrea tridentata* Alliance
- 4161 = *Cylindropuntia acanthocarpa / Pleuraphis rigida* Alliance
- 4211 = *Ephedra californica – Ephedra trifurca* Alliance
- 4212 = *Lepidospartum squamatum* Alliance
- 4213 = *Ericameria paniculatum* Alliance
- 4226 = *Acacia greggii – Hyptis emoryi – Justicia californica* Alliance
- 5112 = *Atriplex confertifolia* Alliance
- 5419 = *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance
- 5424 = *Yucca schidigera* Alliance
- 5511 = *Sarcobatus vermiculatus* Alliance
- 6118 = *Peucephyllum schottii – Pleurocoronis pluriseta* Alliance
- 7211 = *Ambrosia salsola – Bebbia juncea* Alliance
- 7411 = *Suaeda moquinii – Isocoma acradenia* Alliance

Herbaceous

- 2305 = California annual and perennial grassland (Native component) Mapping Unit
- 2330 = Mediterranean California naturalized annual and perennial grassland Group
- 3410 = Arid West freshwater emergent marsh Group
- 3726 = *Distichlis spicata* Alliance

Sparse Types

- 6110 = North American warm desert bedrock cliff and outcrop Group
- 6111 = *Atriplex hymenelytra* Alliance
- 6113 = Mud Hills sparsely vegetated ephemeral herbs Mapping Unit
- 6114 = Unvegetated wash and river bottom Mapping Unit
- 6116 = Sparsely vegetated playa (Ephemeral annuals) Mapping Unit
- 6117 = *Chorizanthe rigida – Geraea canescens* Desert Pavement Sparsely Vegetated Alliance
- 6118 = *Peucephyllum schottii – Pleurocoronis pluriseta* Alliance
- 6120 = North American warm desert dunes and sand flats Group

Miscellaneous Classes

- 9300 = Built-up & Urban Disturbance
    - 9320 = Anthropogenic Areas of Little or No Vegetation 9800 = Water
    - 9805 = Water Impoundment Feature

Other Attributes

Percent of Cover by Conifers

- 0 = None or Not Observable
- 1 = >0-1%
- = >1-5%
- = >5-15%
- = >15-25%
- = >25-50%
- = >50-75%
- = >75-100%
- = Not Applicable/Not Assigned

Percent of Cover by Joshua Tree

- 0 = None or Not Observable
- 1 = >0-1%
- 2= >1-5%
- 3= >5%
- 9 = Not Applicable/Not Assigned

Percent of Cover by Hardwoods

- 0 = None or Not observable
- 1 = >0-1%
- 2 = >1-5%
- 3 = >5-15%
- 4 = >15-25%
- 5 = >25-50%
- 6 = >50-75%
- 7 = >75-100%
- 9 = Not Applicable/Not Assigned

Percent of Cover by Shrub

- 0 = None or Not observable
- 1 = >0-1%
- 2 = >1-5%
- 3 = >5-15%
- 4 = >15-25%
- 5 = >25-50%
- 6 = >50-75%
- 7 = >75-100%
- 9 = Not applicable/Not assigned

Percent of Cover by Herbaceous

- 1 = None, Not Observable, 0-2%
- 2 = >2-15%
- 3 = >15-40%
- 4 = >40-100%
- 9 = Not Applicable/Not Assigned

Percent of Cover by Trees

- 0 = None or Not Observable
- 1 = >0-1%
- 2 = >1-5%
- 3 = >5-15%
- 4 = >15-25%
- 5 = >25-50%
- 6 = >50-75%
- 7 = >75-100%
- 9 = Not Applicable/Not Assigned

Exotics

- 0 = None/Not Observable
- 1 = Low
- 2 = Moderate
- 3 = High
- 9 = Not Applicable/Not Assigned

Roadedness Disturbance

- 0 = None/Not Observable
- 1 = Low (>2/3 contiguous roadless)
- 2 = Moderate (1/3 - 2/3 contiguous roadless)
- 3 = High (<1/3 contiguous roadless)
- 9 = Not Applicable/Not Assigned

Development Disturbance

- 0 = None/Not Observable
- 1 = Low (>0 - 2% of polygon affected)
- 2 = Moderate (>2% - 5% of polygon affected)
- 3 = High (>5% of polygon affected)
- 9 = Not Applicable/Not Assigned

Anthropogenically Altered Disturbance

- 0 = None/Not observable
- 1 = Low (>0% – 33% of polygon affected)
- 2 = Moderate (>33% – 66% of polygon affected)
- 3 = High (>66% of polygon affected)
- 9 = Not Applicable/Not Assigned

Altered Hydrologic Regime Modifier

- 0 = Not Affected
- 1 = Affected
- 9 = Not Applicable/Not Assigned

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.

Land Use

- 0 = Not Assigned/Not Assessed
- 1000 = Urban
- 1436 = Water Transfer (Major Canals, Aqueducts and Agricultural Channels)
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- 7 = Other information
- 8 = Older plot data
- 9 = Older recon data
- 10 = Accuracy Assessment

- 60 = Additional Recon Information

OlTe-PaFl (Ironwood – Blue Palo Verde Presence Modifier)

- 0 = *Olneya tesota and/or Parkinsonia florida* not visible or not consistent in stand
- 1 = *Olneya tesota and/or Parkinsonia florida* present in at least trace amounts and consistent throughout most of the stand

APPENDIX B: MAP UNIT DESCRIPTIONS – 9/30/2023

Explanation of Map Unit Descriptions

This chapter contains descriptions for each of the Vegetation Types (Map Units) represented in the final geodatabase for the current project, which corresponds to the additional mapped lands within the DRECP region. Please refer to Chapter 3 of Menke et al. (2013), Menke et al. (2016), Reyes et al. (2020), and Reyes et al. (2021), for map unit descriptions covering the previous mapping project areas.

The descriptions for the majority of vegetation types have the following components:

A **screenshot** of aerial imagery and a **ground photo** are featured on the first page. The screenshots give the reader a sense of the photo signatures. The stand of vegetation being described is outlined in red. The ground photos, taken by staff during field visits, show the appearance of the plants on the landscape.

The second page includes a **Description**, which discusses the expected locations, percent cover considerations, and other factors pertaining to each vegetation type; **Photointerpretation Signature**, which describes the color, tone, texture, pattern, etc. commonly seen on the aerial imagery; and a listing of **Types with Similar Photointerpretation Signatures**. The signature traits and other characteristics that differentiate each vegetation type in the list from the vegetation type being described are addressed.

Following the Types with Similar Photointerpretation Signatures is a **distribution map** and a brief discussion of the **Distribution** of the vegetation type in the study area. For vegetation types with only a few small polygons in the entire study area, the size of the polygons on the distribution map was enhanced (or represented as a star) so that their locations could be seen. The distribution map shows the vegetation type occurrence only in the current mapping effort.

Following the distribution map discussion is an **elevation range** chart showing the elevation values (count) for a given vegetation type within the study area. The chart was derived by extracting the elevation data (30-meter pixels) from the Digital Elevation Models (DEMs) in the National Elevation Dataset, available from the USGS, using the areal extent of the vegetation type. Along the vertical axis is the number of pixels occurring in the established elevation ranges. Along the horizontal axis are the elevation ranges in meters. This chart is not an elevation profile of the vegetation type, nor does it represent the geographic distribution of its elevation range. It includes the full extent of the vegetation type as mapped in the current mapping effort.

Note, descriptions for vegetation types in the Miscellaneous Classes are similar to the standard descriptions, but the ground photo, list of Types with Similar Photointerpretation Signatures, and elevation range chart have been omitted.

Another consideration is that although the current project used the existing DRECP floristic and mapping classifications as well as mapping criteria to create the fine-scale vegetation map, the floristic classification was augmented with additional classification field data collection and analysis for the Jawbone, Owens Valley, Searles Valley, and West Mojave Trails subareas. The additional classification work may have resulted in criteria modifications for some types, which may have affected the floristic hierarchy or vegetation key. This in turn may have affected the mapping of some alliances in the current project area. These modifications are noted in the Description section of each vegetation type affected.

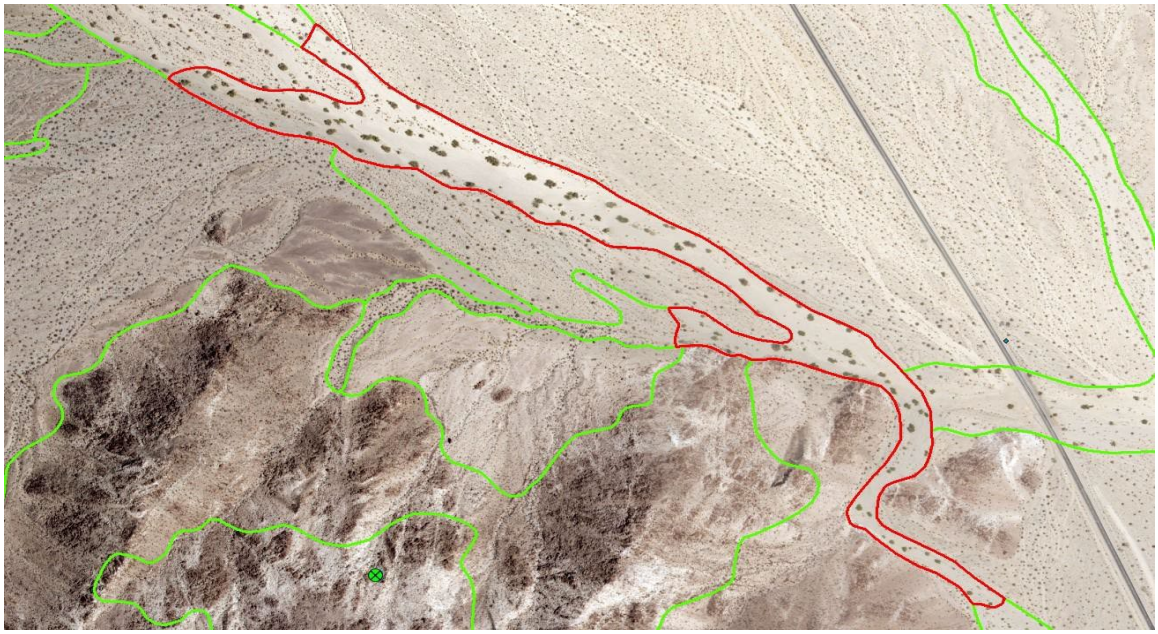
The summary page of alliances at the beginning of each life form section identifies types occurring in Searles Valley as SV, and those occurring in West Mojave Trails A as WMTA.

Trees

- *Chilopsis linearis – Psorothamnus spinosus* Alliance (7222) WMTA
- *Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Alliance (4222) SV

Chilopsis linearis – Psorothamnus spinosus Alliance (7222)

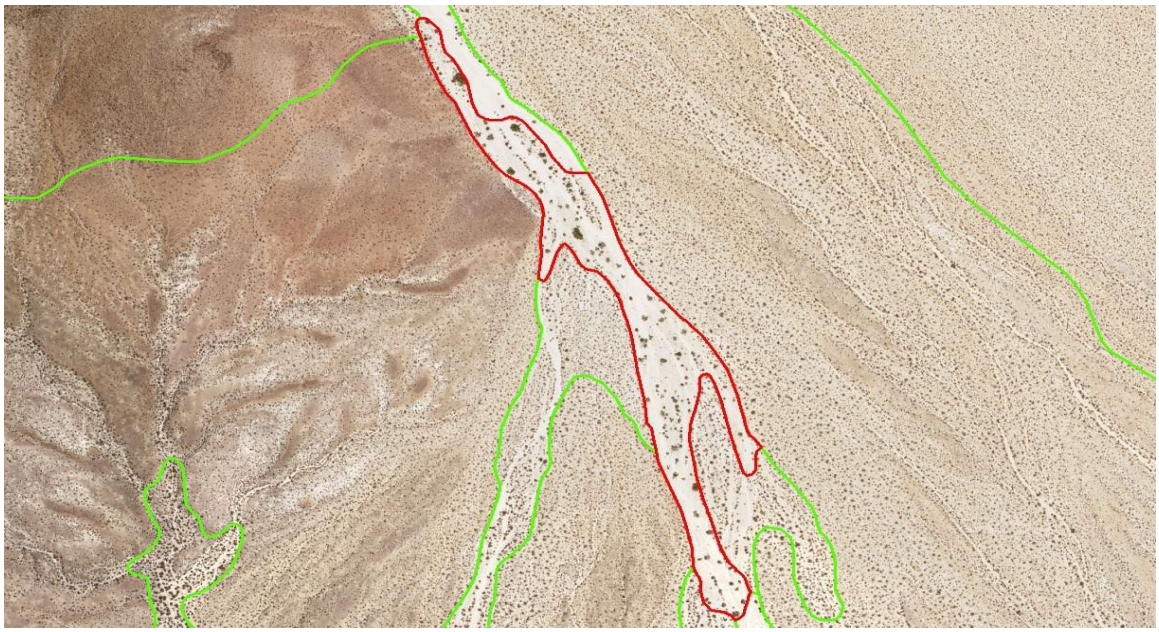
Desert willow – Smoke tree woodland Alliance



The large crowns of *Chilopsis linearis* are seen scattered in this aerial view along the active wash at the base of the mountain slopes at the southern part of the Bristol Mountains.

A ground photo of the spreading large crowns of *Chilopsis linearis* along a broad flat wash at the base of the Bristol Mountains.

Chilopsis linearis – Psorothamnus spinosus Alliance (7222)



The dull gray crowns of *Psorothamnus spinosus* are seen scattered in this aerial photo along the active wash at the base of the mountain slopes at the northeast edge of the Marble Mountains.

The unique silver-gray ghostly crowns of *Psorothamnus spinosus* along a broad flat wash at the northeast edge of the Marble Mountains.

Chilopsis linearis – Psorothamnus spinosus Alliance (7222)

DESCRIPTION: Stands of this alliance are dominated or co-dominated by *Chilopsis linearis,* and/or *Psorothamnus spinosus*, which comprises at least 1 percent of the cover, although *Psorothamnus* may be lower in cover. The alliance is composed of two associations, The *Chilopsis linearis* Association and the *Psorothamnus spinosus* Association.

Chilopsis has a narrower range than *Psorothamnus spinosus. Chilopsis* is usually higher cover than any other tree, although stands may contain similar cover of *Acacia greggii* and/or *Prunus fasciculata. Chilopsis* occurs in washes, intermittent channels, arroyos, or lower canyons that are intermittently flooded. Stands tend to occupy sandy or gravelly washes where wash energy is dissipated across a relatively wide flood path. *C. linearis* is also noted along washes where shallow bedrock or pediment forces underground water to flow up to or near the surface. Stands of *Chilopsis* may be adjacent to *Ericameria paniculata, Ephedra californica, Ambrosia salsola, Atriplex polycarpa* or *A. canescens* in washes as far west as Daggett along the Mojave River. *Chilopsis* does not range up into mountain valleys and narrow arroyos as much as the *Acacia greggii* or *Prunus fasciculata* shrublands do, and does not tend to occupy the most active wash centers where *Psorothamnus spinosus, Ericameria paniculata,* or *Ambrosia salsola* are more likely to occur. Stands are rarely found at permanent springs or seeps and are not usually associated with *Populus fremontii, Salix* spp., or other true riparian species.

Psorothamnus spinosus is consistently distributed in low-energy washes. No other tall tree or tall shrub has greater cover. *Chilopsis linearis* may occur in some stands at equal cover. *Larrea tridentata* or *Ambrosia salsola* may be similar or higher in cover. *P. spinosus* is more commonly found in the Colorado Desert, often in the most active portion of the wash adjacent to *Parkinsonia florida* or *Olneya tesota. P. spinosus* stands are often associated with *Ericameria paniculata* or *Ambrosia salsola* washes, and occasionally with *Ephedra californica* stands.

Note: As part of this project effort, additional classification data collection for the Searles Valley, West Mojave Trails A. Classification analysis were performed using data collected for this project as well as that for Jawbone South and Owens Valley subareas from previous projects. Floristic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Chilopsis linearis* Alliance (4224) and *Psorothamnus spinosus* Alliance (4225) were reassigned as associations of the new *Chilopsis linearis – Psorothamnus spinosus* Alliance (7222).

PHOTOINTERPRETATION SIGNATURE: Both *Chilopsis linearis* and *Psorothamnus spinosus* have distinct signatures. Stands of *Chilopsis linearis* may be sparse to moderately dense in cover with individuals exhibiting a gray to grayish green, diffuse, irregularly shaped crown with a coarse texture. Individual plants can be quite large, at times measuring over 5 meters across. Plants appear spaced apart and follow the edges of large high-energy washes, creating stands that are linear in shape with a white sandy substrate.

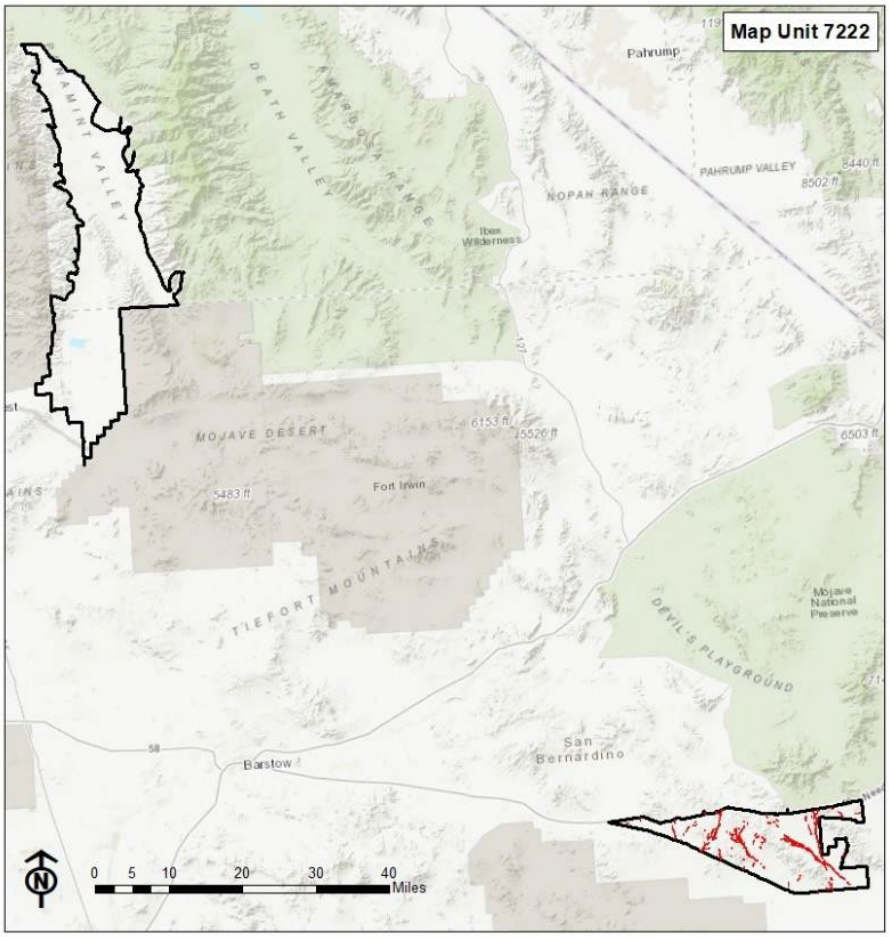
Chilopsis linearis – Psorothamnus spinosus Alliance (7222)

Stands of *Psorothamnus spinosus* can be sparse to moderately dense in cover with a diffuse, irregularly shaped crown edge. The trees appear gray to grayish blue in color with irregular and upright branching that casts shadows within or along the edge of the crown. The shrubs typically occur in the active channel of the wash and many times form meandering linear stands. Stands containing a sparse cover are often so lightly colored that they cannot be distinguished from the similarly colored wash substrate.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

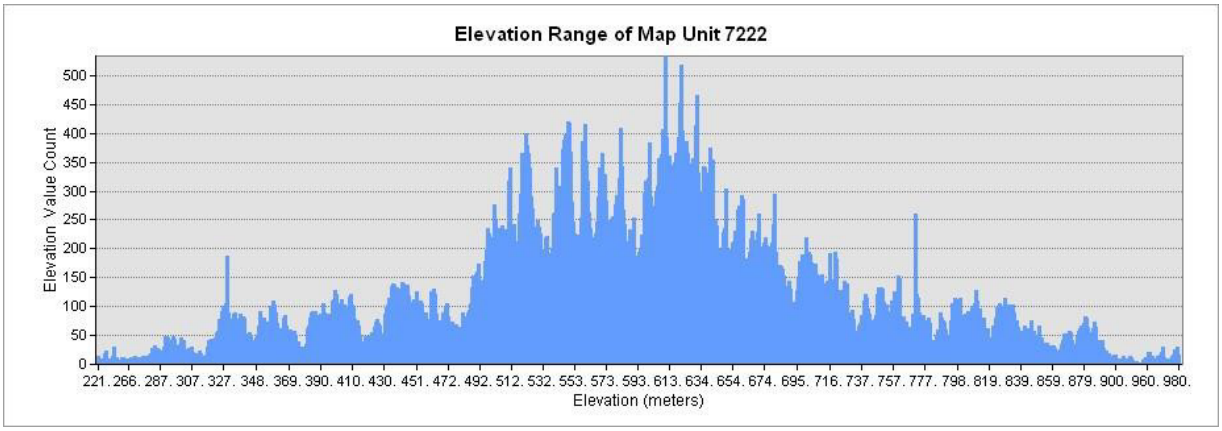
- *Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226) – *Acacia greggii* shrub signature appears similar to that of *Chilopsis*, but typically has a smaller crown and, as with *Hyptis*, tends to occur higher upstream into mountain valleys and narrow arroyos, although *Acacia* occurs throughout mid to lower fans of the West Mojave Trails A subarea. *Chilopsis* was found in more active main washes, and in some cases both occurred together. In contrast *Psorothamnus* is very white to gray and ghostly compared with *Acacia*.
- Unvegetated wash and river bottom Mapping Unit (6114) – In stands where *Psorothamnus spinosus* individuals are small and widely scattered, they may be difficult to detect, and the area may be mistaken for this mapping unit. Shadows cast by *P. spinosus* individuals may be visible on finer-resolution imagery to help make the distinction.

Chilopsis linearis – Psorothamnus spinosus Alliance (7222)



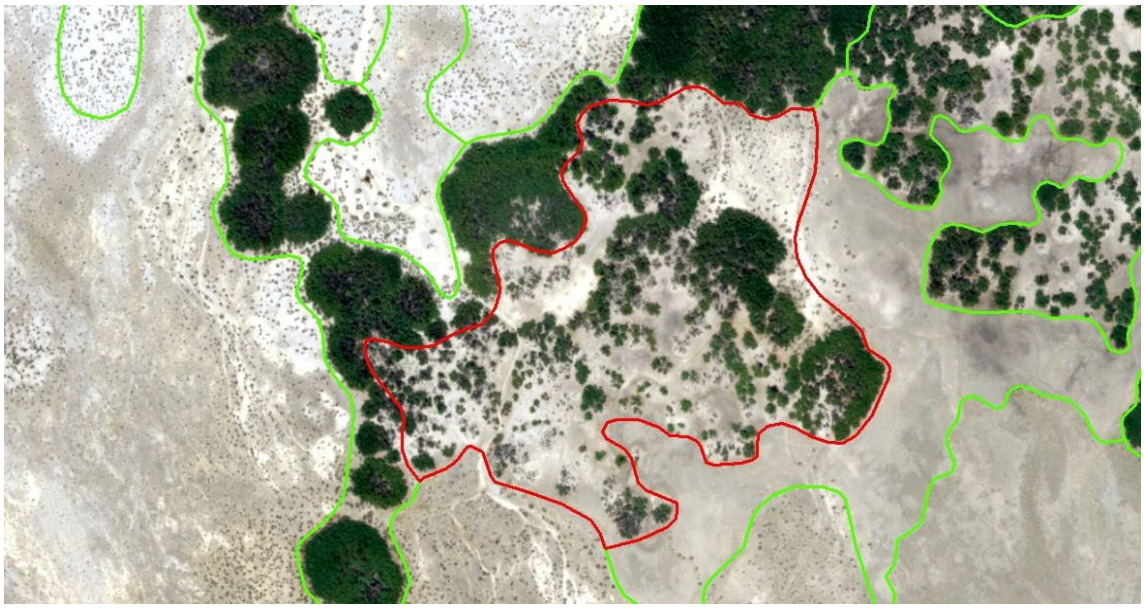
DISTRIBUTION: This alliance is found throughout the Central and Eastern Mojave Desert, and the Colorado Desert. In the current study area, this alliance is distributed throughout the West Mojave Trails A subarea. Most occurrences are *Psorothamnus spinosus* without *Chilopsis linearis* and are very common. About 23 polygons contain *Chilopsis*, with almost half being strongly dominant to dominant. *Chilopsis* occurrences are concentrated in three areas, a large wash at the eastern base of Lava Hills, in the Orange Blossom Wash near Windy Point (Bristol Mountains), and in two smaller washes at the north end of the Marble Mountains near Interstate 40. This alliance is not mapped in the Searles Valley subarea.

Chilopsis linearis – Psorothamnus spinosus Alliance (7222)



Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Alliance (4222)

Mesquite bosque, mesquite thicket Alliance



An aerial view of a stand of *Prosopis glandulosa* of variable tree sizes, just north of Warm Sulphur Springs in the Panamint Valley. Note the typical round and mounded shape of the mesquite. Also note the mesquite in the adjacent stands.

The ground photo displays the rounded mounds of *Prosopis glandulosa* individuals on silty substrate just north of playa and Warm Sulphur Springs in the Panamint Valley. *Atriplex polycarpa* and *Suaeda moquinii* are in the foreground.

Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Alliance (4222)

DESCRIPTION: In this alliance *Prosopis glandulosa* and/or *P. pubescens* comprises at least 2 percent absolute cover (1 percent in sparse stands) as the dominant plant (including shrub and trees together), not exceeded in cover by any other species of microphyllous tall shrub or tree. Understory shrubs may include *Atriplex canescens, A. polycarpa, Larrea tridentata, Pluchea sericea,* and *Suaeda moquinii*, all of which may exceed *Prosopis* in cover. In stands where *P. glandulosa* is consistent in the tall shrub/short tree layer with *Tamarix*, the stand is mapped to *P. glandulosa* even when *Tamarix* dominates the stand. The alliance is usually associated with stabilized dunes or sand sheets adjacent to playas or basins. Stands were mapped even if there was very low cover, especially where there was evidence of recent die-off due to diminishing water supply from groundwater pumping, etc.

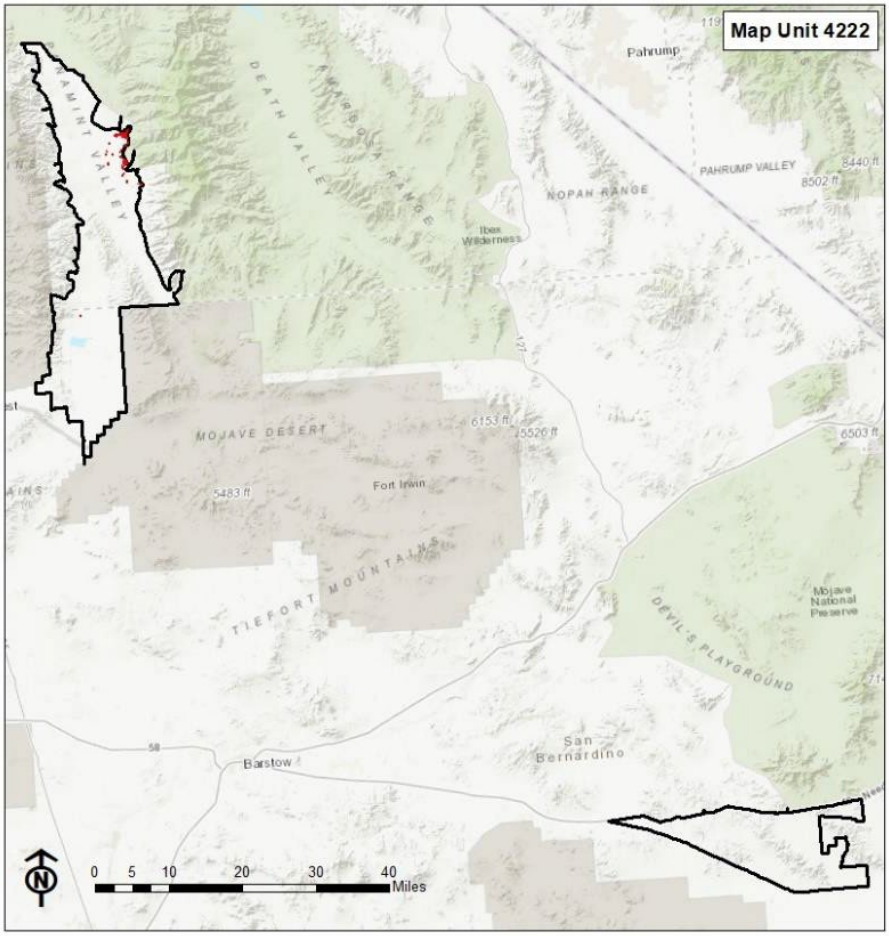
Note: There is criteria change from previous DRECP mapping where cover of *Prosopis* was previously defined as greater than 3 percent. (Menke et al., 2013).

PHOTOINTERPRETATION SIGNATURE: Stands range in cover from sparse to extremely dense, with the low spreading trees appearing bluish gray to dark green in color. Some stands with heavy die-off can appear light gray to dark gray in color with very little green signature. The tree crown is rounded with a well-defined edge. These small trees typically occur on small sandy mounds, often giving them a hummocky appearance.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

- *Tamarix* spp. Semi-natural Stands (1432) – Shrubs from this alliance have a less distinct crown and dense stands have a smoother, less hummocky texture than that of *Prosopis*. *Tamarix* often occurs in dense cover where it is a sole dominant. Signature, color, and tones are highly variable due to a frequent dead component across the stand.

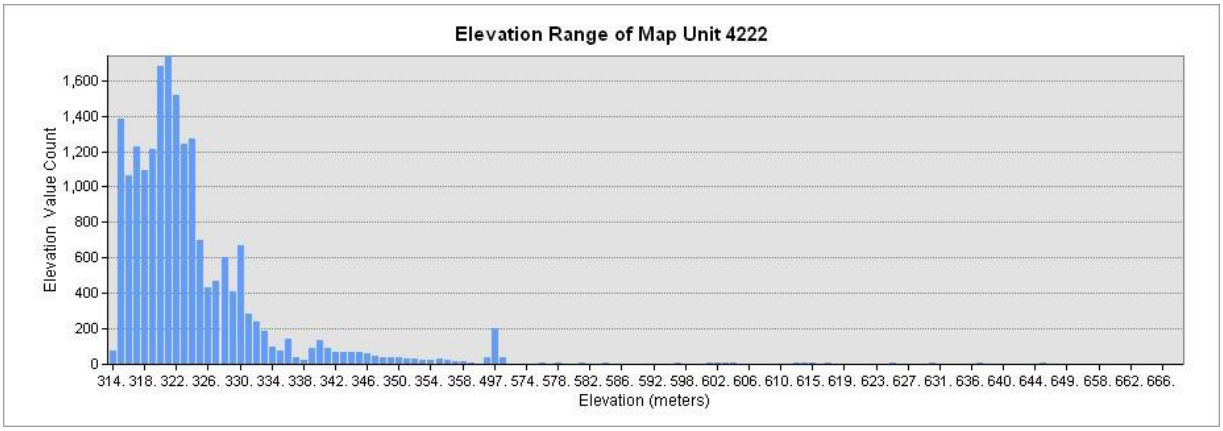
Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Alliance



(4222)

DISTRIBUTION: Stands of this alliance are found along the margins of several dry lakes in the Mojave and Colorado Deserts. Stands also occur near and along the Colorado River floodplain, are common along the Mojave River, and to the south along both sides of the Salton Sea Trough. In the current study area, *Prosopis* is mapped in the Searles Valley as one cluster southeast of Pioneer Point on the northwest edge of Searles Dry Lake. Mostly *Prosopis* is mapped as fringing the north half of Panamint Valley playa, with the highest concentration on north end of the dry lake. The source of moisture from drainages is from the Panamint Range to the northeast, especially Hall Canyon and Jail Canyon. No *Prosopis* is mapped in the West Mojave Trails A subarea.

***Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Alliance (4222)**



Shrubs

- *Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226) WMTA
- *Allenrolfea occidentalis* Alliance (3721) SV
- *Ambrosia dumosa* Alliance (4111) SV WMTA
- *Ambrosia salsola – Bebbia juncea* Alliance (7211) SV WMTA
- *Atriplex confertifolia* Alliance (5112) SV
- *Atriplex polycarpa* Alliance (4113) SV
- *Cylindropuntia acanthocarpa / Pleuraphis rigida* Alliance (4161) (WMTA)
- *Encelia farinosa* Alliance (4114) SV WMTA
- *Ephedra californica – Ephedra trifurca* Alliance (4211) WMTA
- *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419) SV WMTA
- *Ericameria paniculatum* Alliance (4213) SV
- *Larrea tridentata* Alliance (4119) SV WMTA
- *Larrea tridentata – Ambrosia dumosa* Alliance (4115) SV WMTA
- *Larrea tridentata – Encelia farinosa* Alliance (4118) SV WMTA
- *Lepidospartum squamatum* Alliance (4212) SV
- Lower bajada and fan Mojavean-Sonoran desert scrub Group (4110)
- *Salix exigua* Alliance (1424) SV
- *Sarcobatus vermiculatus* Alliance (5511)
- *Suaeda moquinii – Isocoma acradenia* Alliance (7411) SV
- *Tamarix* spp. Semi-natural Stands Alliance(1432) SV
- *Yucca schidigera* Alliance (5424) WMTA

Acacia greggii – Hyptis emoryi – Justicia californica Alliance (4226)

Catclaw acacia thorn – Desert lavender scrub Alliance

An aerial view of *Acacia greggii* following a wash through older alluvial terraces trending south out of the Bristol Mountains.

A ground photo of a wash dominated by the wispy green *Acacia greggii* in the background with the smaller tawny *Ambrosia salsola* in the foreground.

***Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226)**

An aerial view of a wash channel coming out of the Bristol Mountains, with gray *Hyptis emoryi* dominating the shrub layer.

The wash in this ground photo is dominated by the wispy gray *Hyptis emoryi* in the mid view on cobbly substrate, with the smaller tawny *Bebbia juncea* in the foreground.

Acacia greggii – Hyptis emoryi – Justicia californica Alliance (4226)

DESCRIPTION: *Acacia greggii* and/or *Hyptis emoryi* are dominant or co-dominant in the shrub canopy. The alliance is composed of two associations, the *Acacia greggii* Association and the *Hyptis emoryi* Association.

Acacia greggii is characteristic, occasionally with as low as 1 percent cover. No other tall shrub species has greater cover. *Prunus fasciculata* or *Hyptis emoryi* may be of equal or slightly greater cover than that of *Acacia.* Smaller shrubs such as *Larrea tridentata, Ericameria paniculata, Krameria grayi* or *Ambrosia salsola* can have higher cover but no more than three times the cover of *Acacia greggii or Hyptis emoryi* (these taller shrubs are 25% cover or greater). Stands occur in washes and arroyos, as well as in upland valleys and on bouldery slopes. *Acacia greggii* proliferates after disturbances such as flood and fire. Note that there is criteria change since the last classification analysis in which *Acacia greggii* previously had a minimum cover of more than 2 percent.

Hyptis emoryi is the dominant or co-dominant plant in the shrub canopy with cover of at least 2 percent. Other shrub species with similar cover or co-dominant may include *Acacia greggii, Ambrosia salsola, Larrea tridentata,* and *Sarcostemma hirtellum.* Stands are found in rocky washes of upper bajadas and low-elevation canyons

Note: As part of this project effort, additional classification data collection and analysis were performed for the Searles Valley, West Mojave Trails A, Jawbone South, and Owens Valley subareas. Floristic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Acacia greggii* Alliance (4226) and *Hyptis emoryi* Alliance (4228) were reassigned as associations of the new *Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226).

PHOTOINTERPRETATION SIGNATURE: *Acacia greggii* is a taller shrub species often forming irregularly shaped, small but distinct patches along the margins of active channels. Crowns tend to be dense with a dark gray or dark brown color, sometimes with a green tint. Stands can range from sparse to moderately dense in cover and follow linear stream patterns, many times flowing out of mountain canyons and along the base of hills. Overall individuals of this species are almost indistinguishable from *Hyptis emoryi*, other than its slightly larger crown. *A. greggii* often forms small, distinct, irregularly shaped patches of several individual shrubs along wash margins, whereas *Hyptis* individuals are somewhat smaller, and more regular in shape and spacing.

Stands of *Hyptis emoryi* are open to moderately dense in cover and typically occur in the middle or along the margin of the wash channel and in small rivulets between desert pavement settings. Dense stands are narrow and appear a dark green to brownish green with a fairly uniform texture. These plants have a similar signature as *Acacia greggii,* with a slightly grayer, more diffuse crown. This species rarely forms dense patches and is more common in very narrow rivulets, often between pavement surfaces.

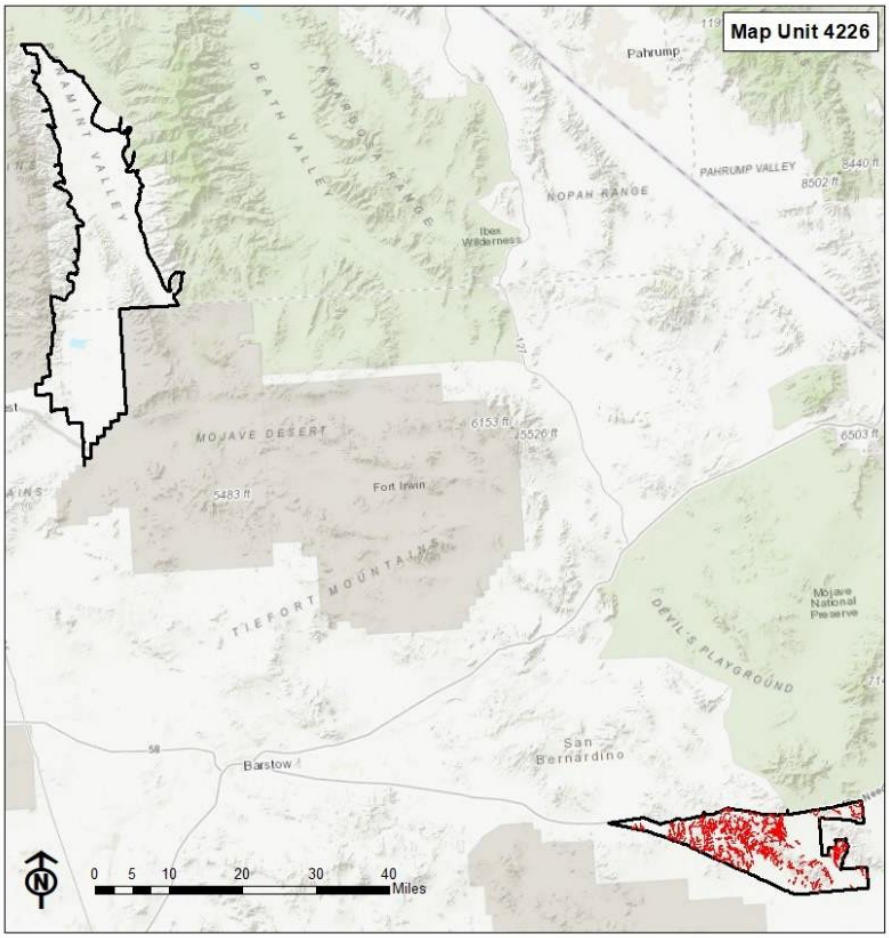
***Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226)**

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

- *Chilopsis linearis – Psorothamnus spinosus* Alliance (4225) – *Psorothamnus spinosus* has a similar gray color as *Hyptis emoryi* but is differentiated by having more of an irregularly shaped and upright crown. Often the spreading upper branches of the small tree cast jagged shadows around the tree crown. Stands tend to occur in sparser cover. *Chilopsis* may appear as a similar signature as *Acacia greggii*, but has a much larger crown.
- *Ericameria paniculata* Alliance (4213) – Shrubs are green to dark green color with a dense rounded crown and tend to occur in less active broader washes.

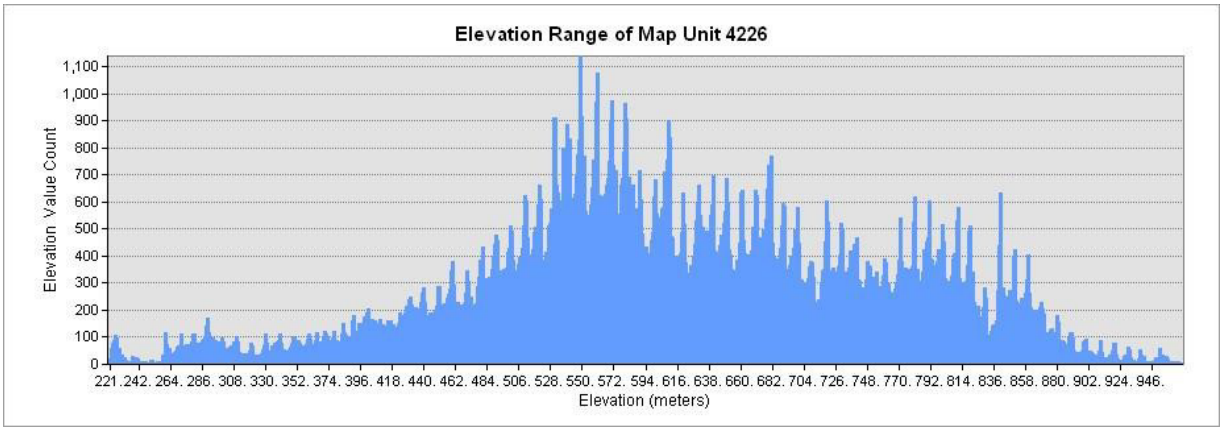
Larrea tridentata Alliance (4119) – Large individuals of *Larrea tridentata* can occupy all portions of weaker washes and can be confused with *Acacia greggii*. *L. tridentata* generally has a rounder crown and is less likely to clump with other individuals, whereas clumping with other shrubs is a common occurrence in the *A. greggii – Hyptis emoryi – Justicia californica* Alliance. Wash substrate where *L. tridentata* dominates has a less scoured appearance, and is therefore more likely to contain a higher weedy herbaceous component.

***Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226)**

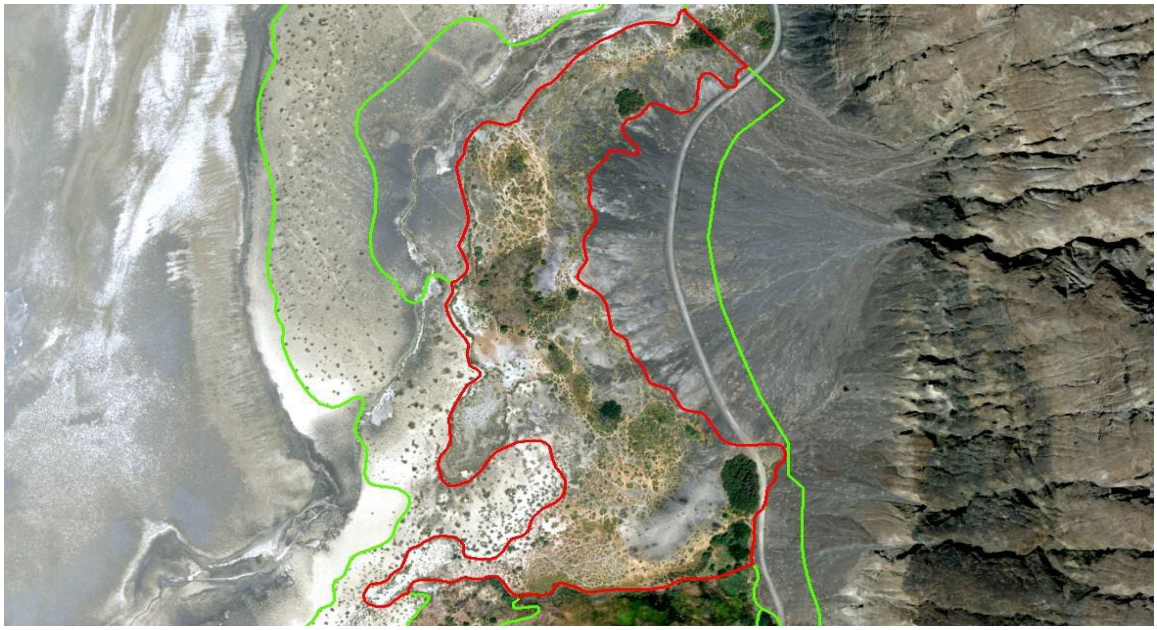


DISTRIBUTION: This alliance is found throughout the Central and Eastern Mojave Desert and the Colorado Desert. In the current study area, *Acacia greggii* is ubiquitous, occurring throughout the West Mojave Trails A subarea, widely distributed in mountain and fan washes, and commonly occurring with *Psorothamnus spinosus*. *Hyptis emoryi* is more common in the upper fan washes at the base of and in the mountain foothills. This alliance is not mapped in the Searles Valley subarea.

Acacia greggii – Hyptis emoryi – Justicia californica Alliance (4226)



Allenrolfea occidentalis Alliance (3721)



Iodine bush scrub Alliance

This aerial image shows an extensive stand of *Allenrolfea occidentalis* in the middle of a playa in the Panamint Valley.

The ground photo shows a “pure” stand of *Allenrolfea occidentalis* occurring in a temporarily flooded, alkaline playa margin in the Panamint Valley.

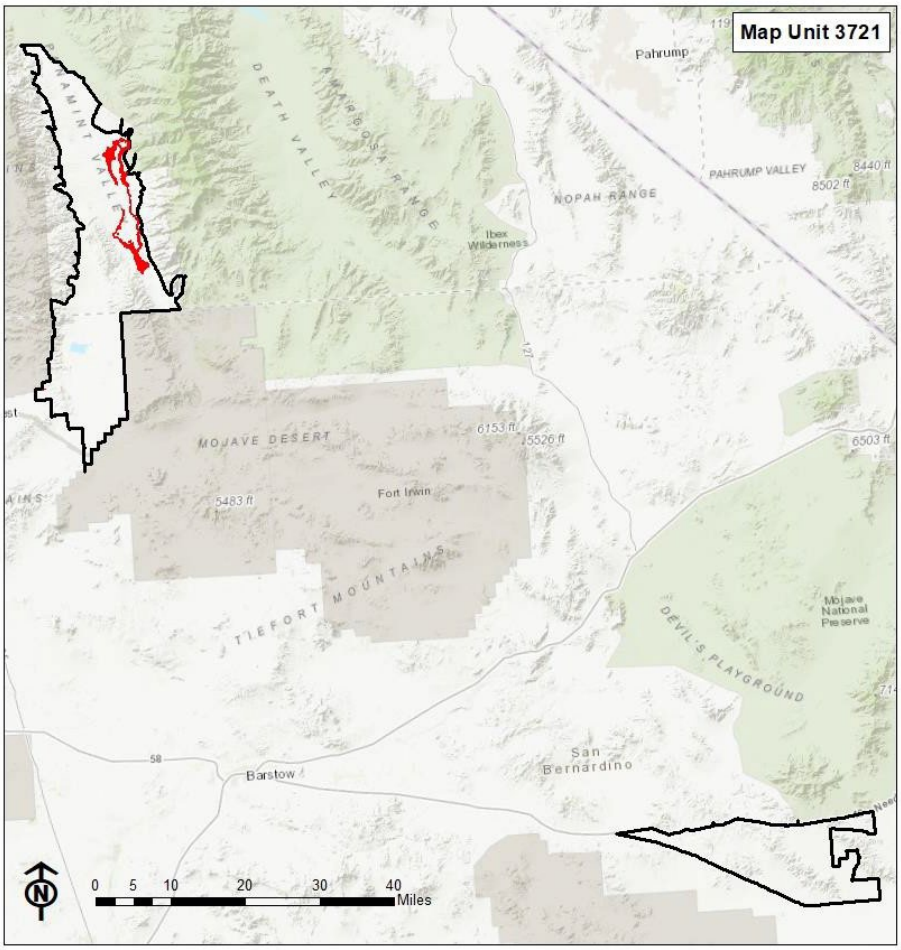
***Allenrolfea occidentalis* Alliance (3721)**

DESCRIPTION: Polygons mapped as this alliance typically have *Allenrolfea occidentalis* comprising more than 2 percent absolute cover in the shrub canopy and no other species with greater or equal cover, except *Suaeda moquinii*, *Atriplex confertifolia*, or *A. canescens*. Leaves are usually scale-like and inconspicuous. The stands are commonly restricted to salty basins that may be seasonally inundated or saturated. They can be found in saline playas and on the margins of salt pannes. They also occur on hummocks that are widely spaced on relatively flat playas. Stands may also form borders between the edges of stabilized dunes and the edges of playas. In general, stands in the Mojave and Colorado deserts have small, low, widely to intermittently spaced shrubs, but stands at China Dry Lake are denser and have a *Distichlis spicata* understory. If herbs are present, they are less than three times the cover of the shrubs.

PHOTOINTERPRETATION SIGNATURE: The stands are open to sometimes moderately dense in cover, occurring as small dark brown to grey or green rounded shrubs. These shrubs establish in the most saturated and saline areas of the playa, many times situated on hummocks or the lowest ring of perennial vegetation around desert salt flats. Stands are characterized by a monotypic signature of shrubs due to the inability of most other species to tolerate the salinity and saturation levels, which lowers species diversity. The herbaceous layer is sparse, and saline characteristics of the soil yield a highly reflective signature adjacent to the plants. Stands commonly clone and individual “clones” can often be several meters across.

TYPES WITH SIMILAR PHOTO INTERPRETATION SIGNATURES:

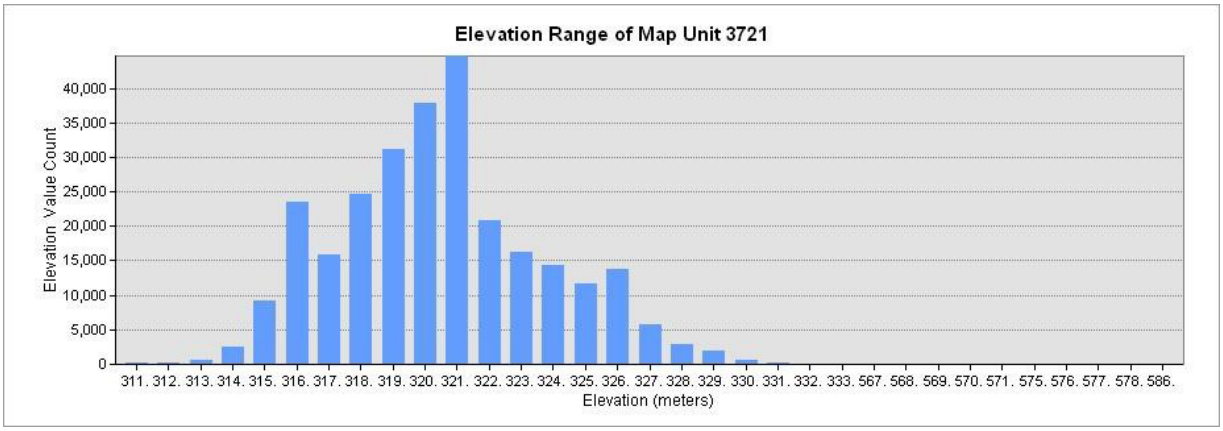
- *Atriplex confertifolia* Alliance (5112) – The color and texture of these shrubs are almost indistinguishable from *Allenrolfea occidentalis* but *Atriplex confertifolia* prefers slightly less saturated margins of lakes and occurs with a higher diversity and cover of shrubs. *Atriplex confertifolia* is mapped in Searles Valley but not in Panamint Valley whereas *Allenrolfea occidentalis* is mapped in the Panamint Valley and not in Searles Valley.
- *Suaeda moquinii* – *Isocoma acradenia* Alliance (7411) – *Suaeda moquinii* can sometimes mix with *Allenrolfea occidentalis* but in low cover and may have a browner color.



***Allenrolfea occidentalis* Alliance (3721)**

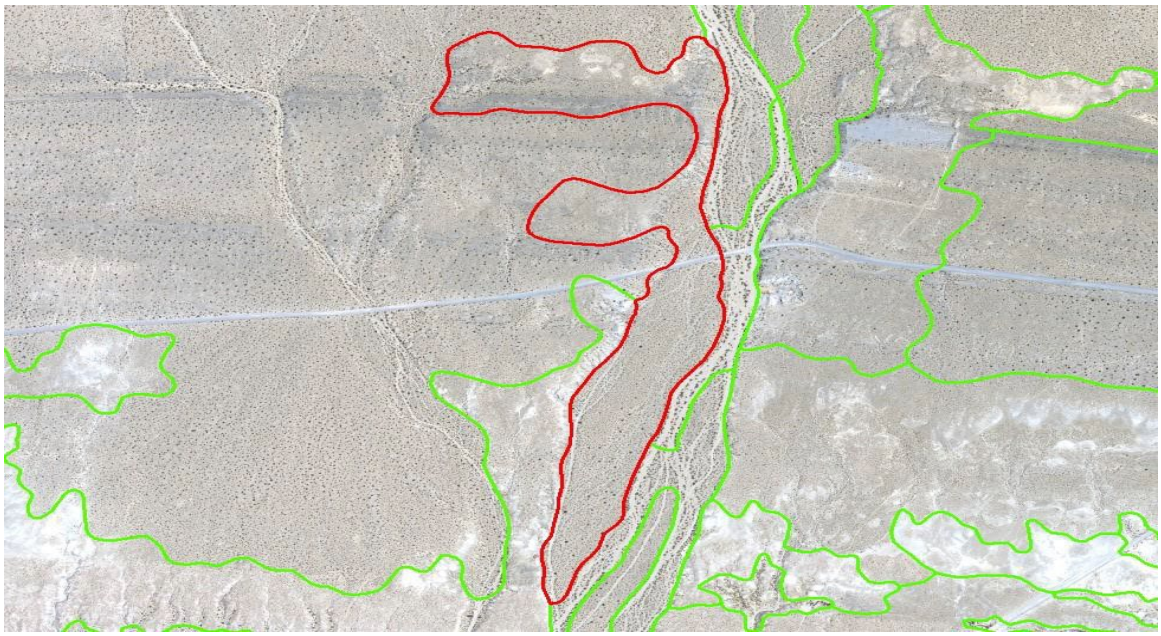
DISTRIBUTION: Stands are found along dry lakes throughout the DRECP. This species also occurs along margins of the Colorado River. In the current study area, *Allenrolfea* is mapped exclusively around the perimeter of the Panamint Valley playa in the Searles Valley subarea, especially as broad bands/stands in the north end, and narrow bands in the south half, with a higher concentration in large stands at the southern tip of playa. This alliance is not mapped in the West Mojave Trails A subarea.

***Allenrolfea occidentalis* Alliance (3721)**



Ambrosia dumosa Alliance (4111)

White bursage scrub Alliance



An aerial view of small shrubs of *Ambrosia dumosa* dominating the shrub layer on a wide terrace in the Searles Valley.

Ground view of a large stand of *Ambrosia dumosa* on a stream terrace with some *Atriplex polycarpa* mixed in. Stand is in the northern part of Searles Valley.

***Ambrosia dumosa* Alliance (4111)**

DESCRIPTION: In this alliance *Ambrosia dumosa* comprises more than 2 percent cover (1 percent in very sparse stands) and exceeds any other shrub in cover, with the exception of *Grayia spinosa* and *Atriplex spinifera*. Stands lack significant cover of *Larrea tridentata,* or *L. tridentata* cover is patchy and not uniformly distributed and comprises less than or equal to 2 percent of absolute cover and/or *Ambrosia dumosa* > 3 times the cover. Stands are on uplands with relatively fine-textured soil, or on terraces adjacent to medium to large washes. They also may occur on steep slopes with neutral or southerly exposures that are not too bouldery. In the interior mountains of the Colorado Desert *Ambrosia dumosa* is commonly found on a light-colored calcareous substrate. In the Western Mojave Desert stands often result from fire or clearing of *L. tridentata* in areas formerly supporting mixed *Larrea tridentata – Ambrosia dumosa* communities. In alkaline basins, above *Atriplex spinifera* or *Atriplex polycarpa, Ambrosia dumosa* mixes with a high diversity of shrubs, forming a "bathtub ring" below the *Larrea tridentata – Ambrosia dumosa* zone on the surrounding fans and bajadas. In these "bathtub ring" settings, when *Ambrosia dumosa* co-dominates with *Krascheninnikovia lanata, Ericameria cooperi, Tetradymia* spp*.,* or *Eriogonum fasciculatum,* the stands are mapped as the *Ambrosia dumosa* Alliance. However, when *Ambrosia dumosa* co-dominates with *Grayia spinosa* or *Atriplex spinifera,* stands are mapped as *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance or *Atriplex spinifera* Alliance respectively. Where *Ambrosia dumosa* and *Atriplex canescens* co-dominate, the stand is considered the *Atriplex canescens* Alliance.
Like several alliances in the study area, *Ambrosia dumosa* individuals occur as a component or dominant shrub in high-elevation settings along the eastern Sierra Nevada foothill slopes and in nearby cold-air basins in the western Mojave Desert above 3000 feet (910 meters). Conversely, stands also occur on light-colored soils of mountain slopes in the Colorado Desert near or adjacent to stands of *Encelia farinosa* in elevations as low as 300-400 feet (90-120 meters). The complex relationships between elevation, cold-air basins and how they govern temperatures, along with disturbance characteristics and edaphic settings, are not yet well understood as a means for predicting the overall distribution of this type.

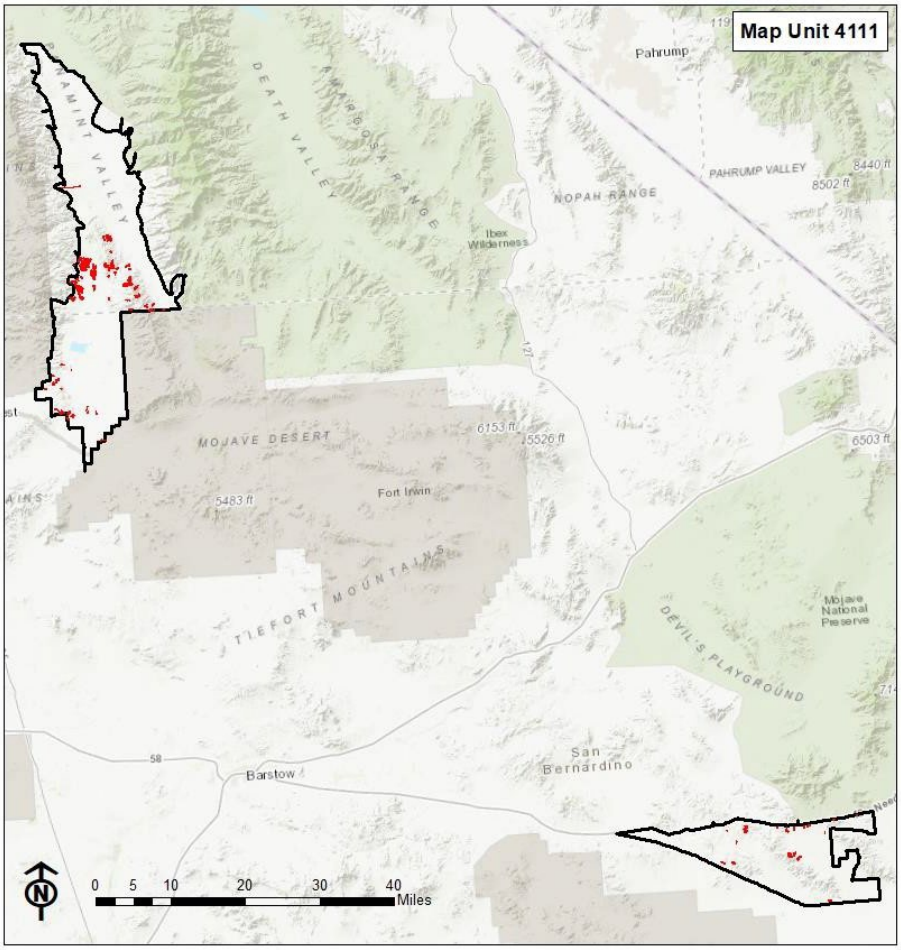
PHOTOINTERPRETATION SIGNATURE: Stands are typically open to moderately dense with evenly spaced small shrubs and very few if any taller shrubs. The crowns are gray to brown in color with a rounded, fairly well-defined edge.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

- *Ambrosia salsola – Bebbia juncea* Alliance (7211) – *Ambrosia salsola* has a similar signature but is more likely to occur in fluvial-related disturbances, especially in conjunction with rivulet-strewn sheet flow and lower-energy wash environments. It does not occur on steep or rocky slopes. This alliance is more likely to colonize anthropogenic clearings rather than burns.

***Ambrosia dumosa* Alliance (4111)**

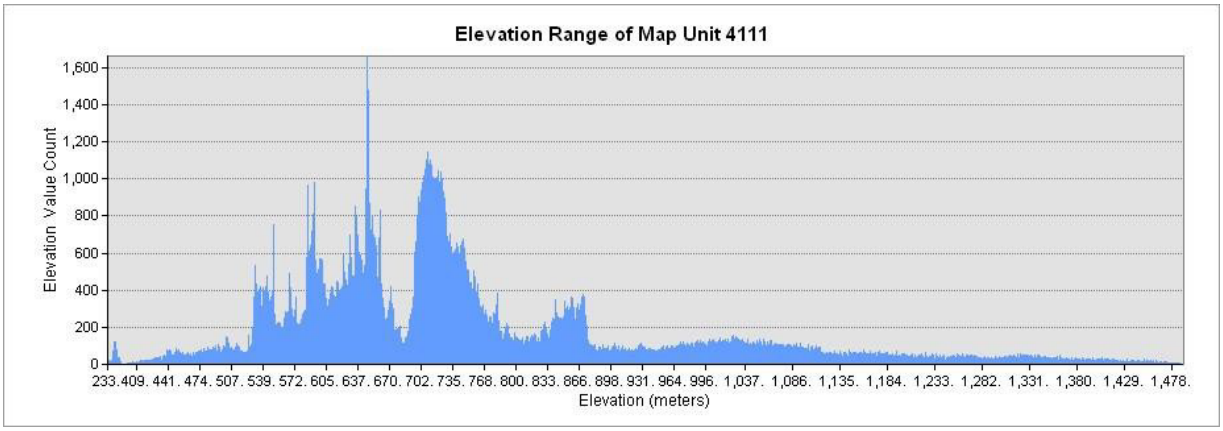
- *Atriplex hymenelytra* Alliance (6111) – Stands dominated by this species of *Atriplex* usually occur on dark substrate, often on upper fans or lower slopes that are volcanic in origin. *Atriplex hymenelytra* shrubs are overall somewhat lighter colored, yielding brighter tones.
- *Atriplex polycarpa* Alliance (4113) – These plants are found in slightly more alkaline settings and are more likely to occur in agricultural-related disturbance near dry lake beds. Crowns are larger and signature color variability is lower, generally a light to medium gray. In natural settings, they are limited to upper alkaline margins around playas and in washes, especially in washes that contain slightly basic soil chemistry.
- *Encelia farinosa* Alliance (4114) – Although the ranges of the two alliances overlap, *Encelia farinosa* favors hotter climates and does not tolerate severe freezes. Distribution is highly restricted in the western Mojave Desert where *Ambrosia dumosa* is abundant. This trend reverses somewhat in the Colorado Desert, where *E. farinosa* is widespread. *E. farinosa* tends to favor dark-colored (volcanic) rock throughout its range. On dark rock, individual shrubs appear very light and tend to have a slightly larger crown on average. Cover often varies considerably across the stand. *E. farinosa* is more likely to be found on mountain slopes rather than alluvial fans.
- *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419) – In the study area for this project, this alliance occurs in colder locations, generally on desert ranges at higher elevations on well-protected north-facing slopes. Shrub size is slightly larger, and species diversity within the stand is higher, creating a variable signature.
- *Pleuraphis rigida* Alliance (4122) – Stands of *A. dumosa* at times occur in close proximity to the uncommonly mapped *P. rigida* Alliance. In these settings, *Ambrosia dumosa* has a lighter hue overall and unlike *P. rigida*, rarely clones.



***Ambrosia dumosa* Alliance (4111)**

DISTRIBUTION: This alliance is found throughout the DRECP area, but primarily in the Mojave Desert regions. The alliance does not occur in the Western Antelope Valley zone or in the foothills of the Transverse Ranges. *Ambrosia dumosa* is less common in the Colorado Desert but does occur frequently as a co-dominant with *Larrea tridentata* on lower fans and bajadas. In the current study area, the alliance is mapped mainly in the hills and mountains of the West Mojave Trails A subarea, and rarely in wash and upland disturbances. In the Searles Valley subarea, there are considerable occurrences in the Slate Range and at the north end of Searles Valley, with a few sites around Poison Canyon and the Pinnacles. Only one polygon was mapped in the Panamint Valley at the base of the Slate Range.

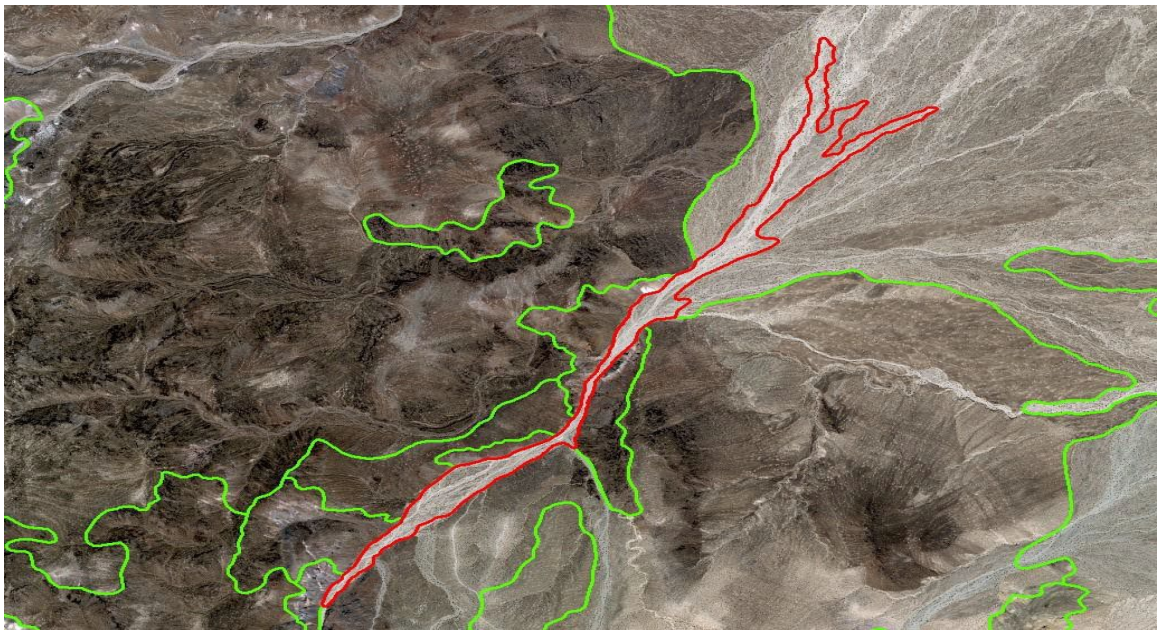
***Ambrosia dumosa* Alliance (4111)**



South subareas

Ambrosia salsola – Bebbia juncea Alliance (7211)

Cheesebush – sweet bush scrub Alliance



This aerial view depicts an *Ambrosia salsola-Bebbia juncea* wash in Fish Canyon on the southwest side of the Panamint Valley.

This ground view shows scattered tawny shrubs of *Ambrosia salsola* and *Bebbia juncea* occupying a sandy to cobbly wash setting in Fish Canyon of the Panamint Valley.

***Ambrosia salsola – Bebbia juncea* Alliance (7211)**

DESCRIPTION: *Ambrosia salsola* characterizes the stands and typically has the highest cover, comprising more than 50 percent relative cover in the dominant shrub layer. *A. salsola* may mix with equal or somewhat higher amounts of *Senna armata* or with *Larrea tridentata* in washes and still be considered this alliance. Where *Eriogonum fasciculatum* co-dominates with *Ambrosia salsola*, the stand is considered as the *E. fasciculatum* Alliance. Stands occur in washes or on gently-sloping disturbed uplands. Upland stands are usually associated with fire, clearing, grazing, or other disturbance in former *Larrea tridentata-Ambrosia dumosa*, *Juniperus californica, Yucca schidigera, Coleogyne ramosissima* or other upland vegetation stands. Most non-fire-related stands of *A. salsola* are associated with washes in lower and mid elevations. Stands in washes were mapped if they were larger than five acres in size. If smaller, they were mapped with the adjacent best-wash indicator. This alliance may include strongly dominant stands of *Bebbia juncea, Brickellia incana*, *Senna armata*, or *Brickellia desertorum*. Note that a large strongly dominant stand of Senna armata was observed at the juncture of the Salt Wells Valley and Poison Canyon along the south side of State Highway 178.

Note: There is criteria change from previous DRECP mapping where co-dominance of *Ambrosia salsola* with *Larrea tridentata* was mapped as the *Larrea tridentata* Alliance. (Menke et al., 2013).

Note: As part of this project effort, additional classification data collection and analysis were performed for the Searles Valley, West Mojave Trails A, Jawbone South, and Owens Valley subareas. Floristic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Ambrosia salsola* Alliance (4216) and *Bebbia juncea* Alliance (4218) were reassigned as a Mapping unit and Association of the new *Ambrosia salsola – Bebbia juncea* Alliance (7211) respectively.

PHOTOINTERPRETATION SIGNATURE: Stands of *Ambrosia salsola* vary in cover from sparse to moderately dense. Individuals appear as small gray to gray-brown to yellow-brown shrubs with diffuse crowns. Stands occurring in wash settings rarely have dense cover and vary considerably along the weaker margins of the channel. On disturbed sites, shrub cover can be fairly high. In both settings, species diversity tends to be fairly low, resulting in minimal variability of the signature. Signature variability depends primarily on substrate and shrub cover.

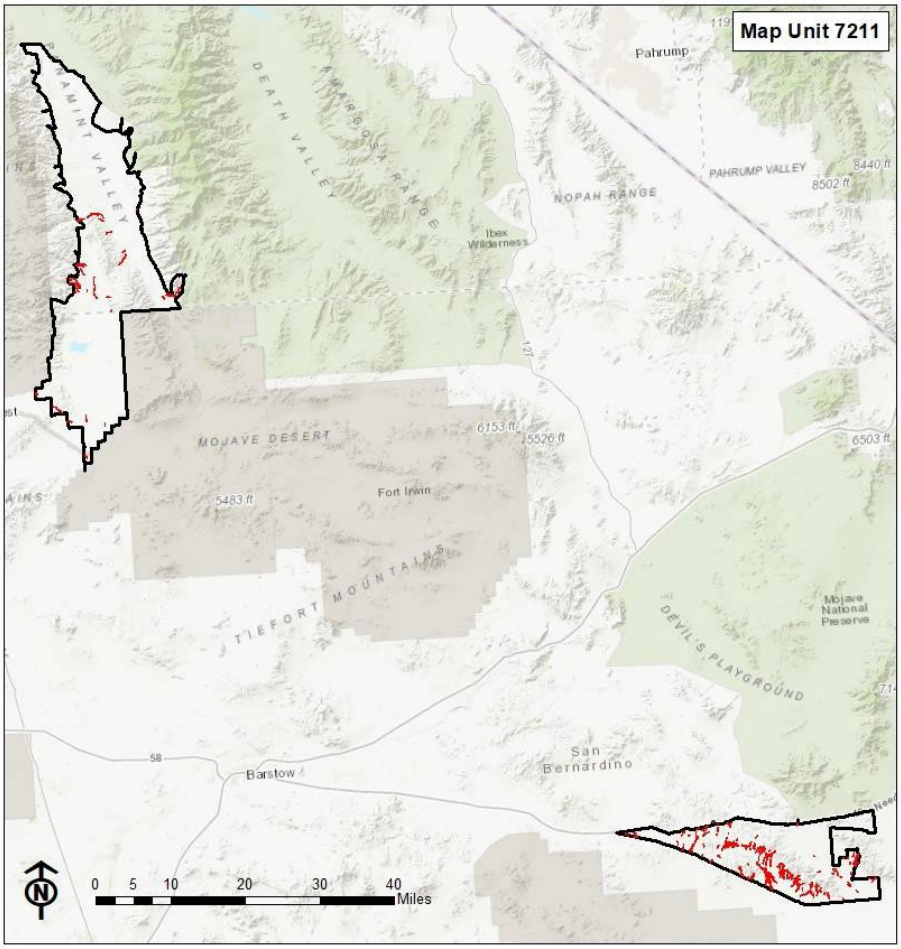
TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

- *Ambrosia dumosa* Alliance (4111) – These shrubs have a similar signature but are found in less-disturbed sites and generally not in wash settings. *Ambrosia salsola* tends to grow in clumpier patches.
- *Atriplex polycarpa* Alliance (4113) - This species at times occurs as a dominant in washes near playa systems and in washes draining alkaline-trending volcanic mountain soils. In these settings, shrubs tend to be larger, lighter in color, and denser in cover.

***Ambrosia salsola – Bebbia juncea* Alliance (7211)**

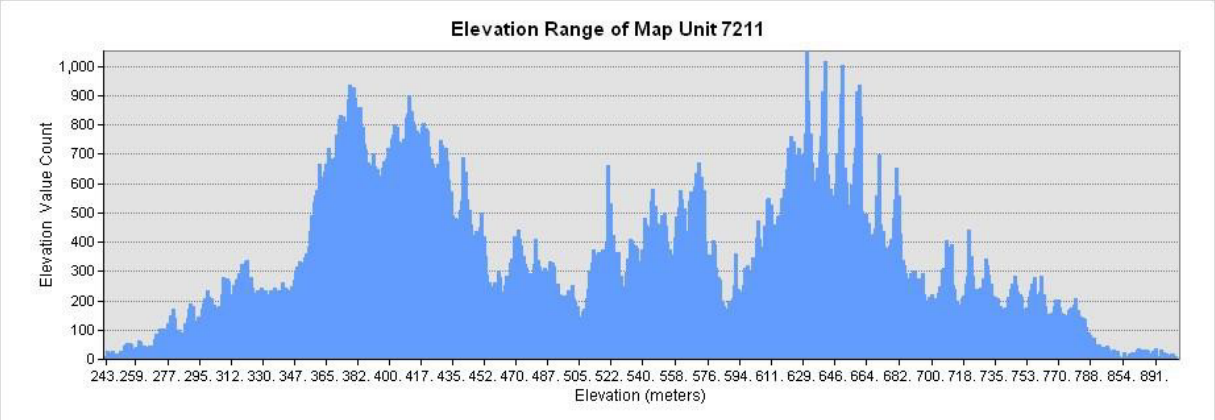
- *Ericameria paniculata* Alliance (4213) – These plants have a larger well-defined crown with a greener color, and are usually confined to the larger wash braids and relatively low-energy wash channels.
- *Lepidospartum squamatum* Alliance (4212) – These shrubs are distinguished by having a browner color, usually with a larger crown. *Lepidospartum* tends to occupy higher-energy washes.

***Ambrosia salsola – Bebbia juncea* Alliance (7211)**



DISTRIBUTION: This alliance is found throughout the Western, Central, and Eastern Mojave Regions. Stands greatly diminish east of Yucca Valley and are mainly associated with human disturbance. Stands of this alliance are mostly absent from the eastern portion of the Colorado Desert. In the current study area, this alliance was mapped in several washes coming from Panamint Range, Slate Range, Argus Range, and Trona Pinnacles Recreation area, as well as a few washes in Searles Valley, north and south of Searles Lake. In the West Mojave Trails A subarea, it is very common, with many occurrences in washes coming from south side of the Bristol Mountains.

***Ambrosia salsola – Bebbia juncea* Alliance (7211)**



Atriplex confertifolia Alliance (5112)

Shadscale scrub Alliance

This large-scale aerial image of *Atriplex confertifolia* shows the variation in shrub density and substrate within a single stand. The white, highly reflective scalding and sandy substrate. Stand is at the southern part of the Argus Range just north of State Highway 178.

Atriplex confertifolia occurs in this ground photo as evenly spaced individuals on sandy soil, with *Ambrosia dumosa*, over an open grassy understory.

***Atriplex confertifolia* Alliance (5112)**

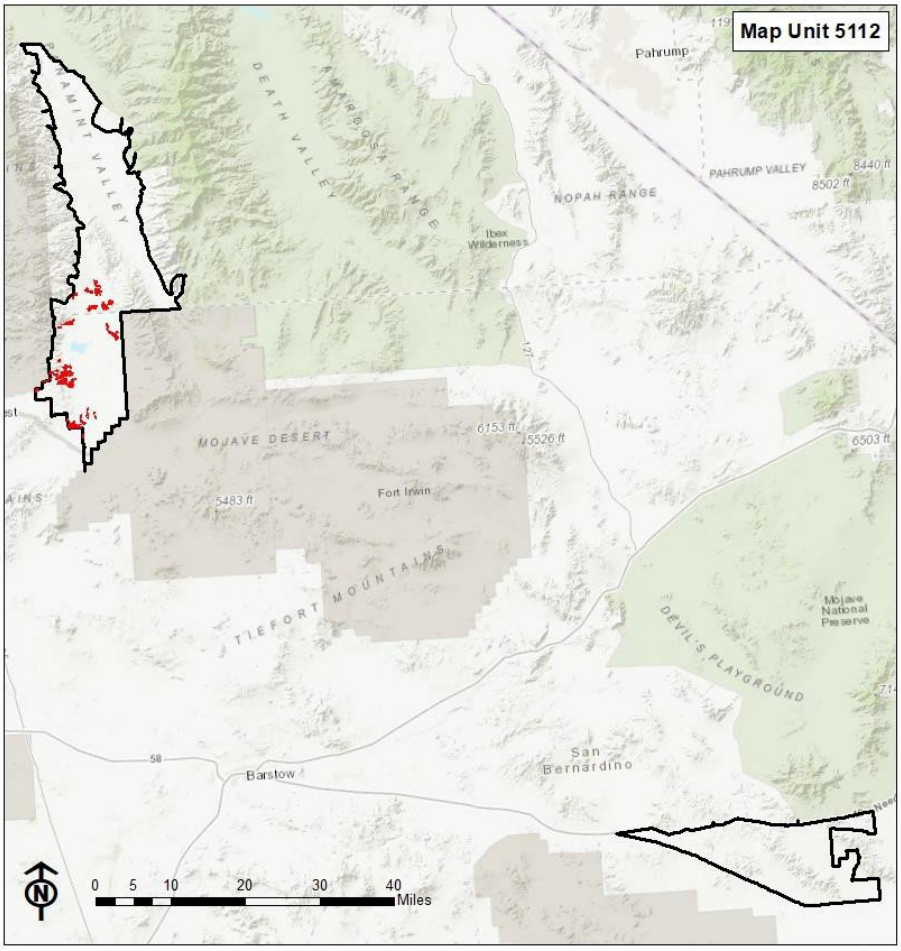
DESCRIPTION: *Atriplex confertifolia* typically has the highest shrub cover, or co-dominates with *A. spinifera, Ambrosia dumosa, Atriplex polycarpa,* and/or *Artemisia spinescens* on playa edges. When co-dominant with *Suaeda* on playas, stands are considered as the *Suaeda moquinii – Isocoma acradenia* Alliance. If *Larrea tridentata* is co-dominant, stands are considered as the *Larrea tridentata* Alliance. If *Atriplex confertifolia* and *Allenrolfea occidentalis* co-dominate, the alliance is called to the latter. When mixed with *Stanleya pinnata, Lepidium fremontii,* and *A. parryi,* stands are called as the *A. confertifolia* Alliance. When associated with pool and swale topography and *Lasthenia* spp., then stands are considered as *A. confertifolia* Alliance. Stands may occur in alkaline valleys or playas and in the upper mid-elevation Mojave Desert on rolling hills and slopes. Stands are common in the northern portion of the desert on rhyolite, upland alkaline soils or silty badlands. According to Charlton (in Lichvar et al. 2004), at Edwards Air Force Base, *A. confertifolia* tolerates more saline and finer soils than *A. spinifera* (in areas that have high salt and clay concentrations from hydrological activity at lower elevations).

PHOTOINTERPRETATION SIGNATURE: Stand cover ranges from sparse to moderately dense with plants typically appearing as small rounded gray to gray-brown shrubs. Stands along playa margins and scalds often have variable shrub and herbaceous cover densities as well as a high diversity of shrub species. However, where disturbance occurs, species diversity is reduced and a denser grassy understory is more common. *A. confertifolia* also occurs in very sparse stands on hills whose geologic substrate is composed of ancient alkaline lake deposits.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

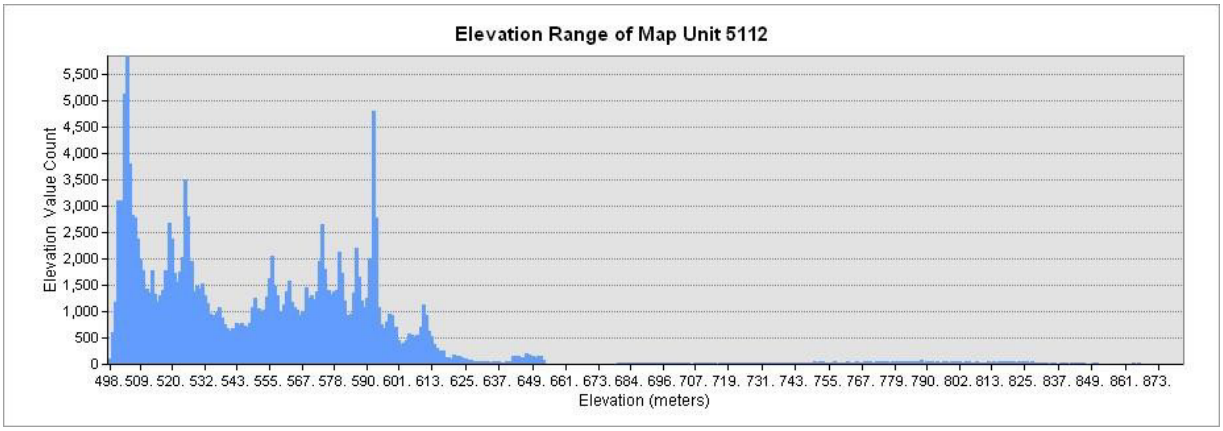
- *Allenrolfea occidentalis* Alliance (3721) – These plants typically do not form extensive stands, the Panamint Valley being an exception, and occur in closest proximity to the most alkaline and saturated portions of the playa and salt pannes.
- *Atriplex polycarpa* Alliance (4113*)* – Shrubs have a slightly larger crown size, appear bluish gray, and can form much denser stands.
- *Suaeda moquinii – Isocoma acradenia* Alliance (7411) – *Suaeda moquinii* shrub color typically has a darker, browner appearance.

***Atriplex confertifolia* Alliance (5112)**



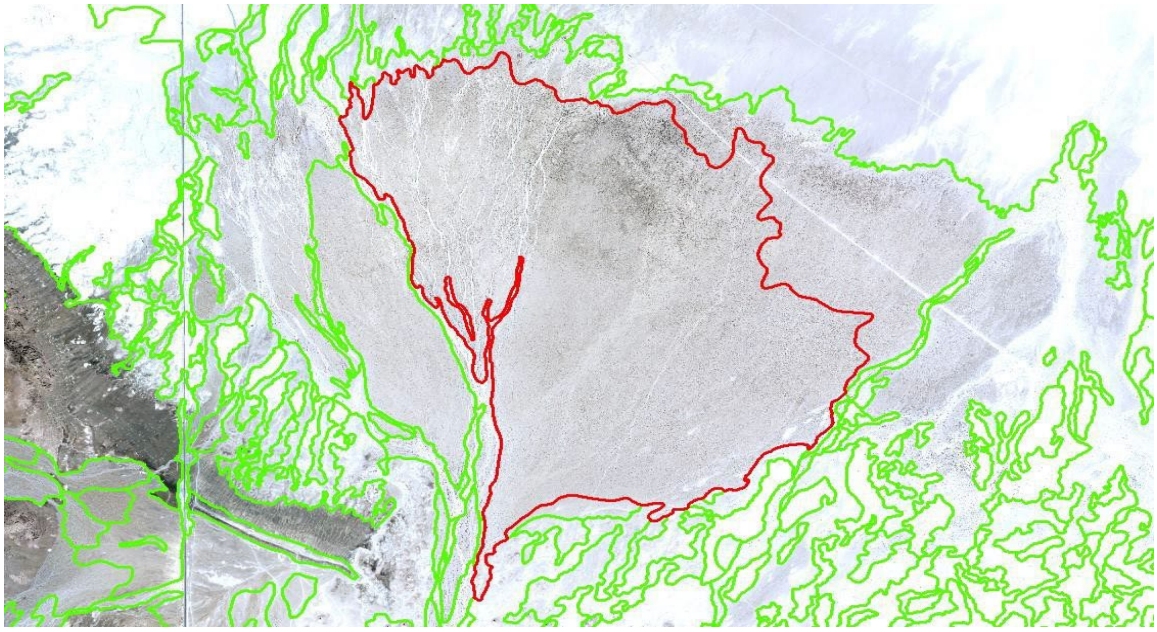
DISTRIBUTION: This alliance is restricted to the Antelope Valley, Northern Mojave, the westernmost portion of the Central Mojave region, and the Eastern Mojave Desert region north of Mesquite Lake. *Atriplex confertifolia* is absent in the eastern portion of the Central Mojave Desert region and the Colorado Desert region due most likely to lower precipitation and higher average temperatures. In the Searles Valley subarea of the current study area, *Atriplex confertifolia* is mapped primarily surrounding Searles Lake on north, west and south. The largest stands are at the mouth of Poison Canyon on the west side of Searles Lake. Bands and stands also occur along the east and north of Searles Lake between *Suaeda moquinii* and *Atriplex polycarpa* areas. Some stands are also found on upper fans northwest of the city of Trona, and north and northeast of Valley Wells. This alliance was not mapped in the Panamint Valley. The alliance was also not mapped in the West Mojave Trails A subarea.

***Atriplex confertifolia* Alliance (5112)**



Atriplex polycarpa Alliance (4113)

Allscale scrub Alliance



This aerial view shows a fairly homogenous stand of *Atriplex polycarpa* drapes over an alluvial fan emanating from the southern part of the Argus Mountains, toward Searles Lake.

The ground photo shows a fairly consistent stand of wispy grayish green *Atriplex polycarpa* occupying a grassy alluvial fan, with the Trona Pinnacles in the background.

***Atriplex polycarpa* Alliance (4113)**

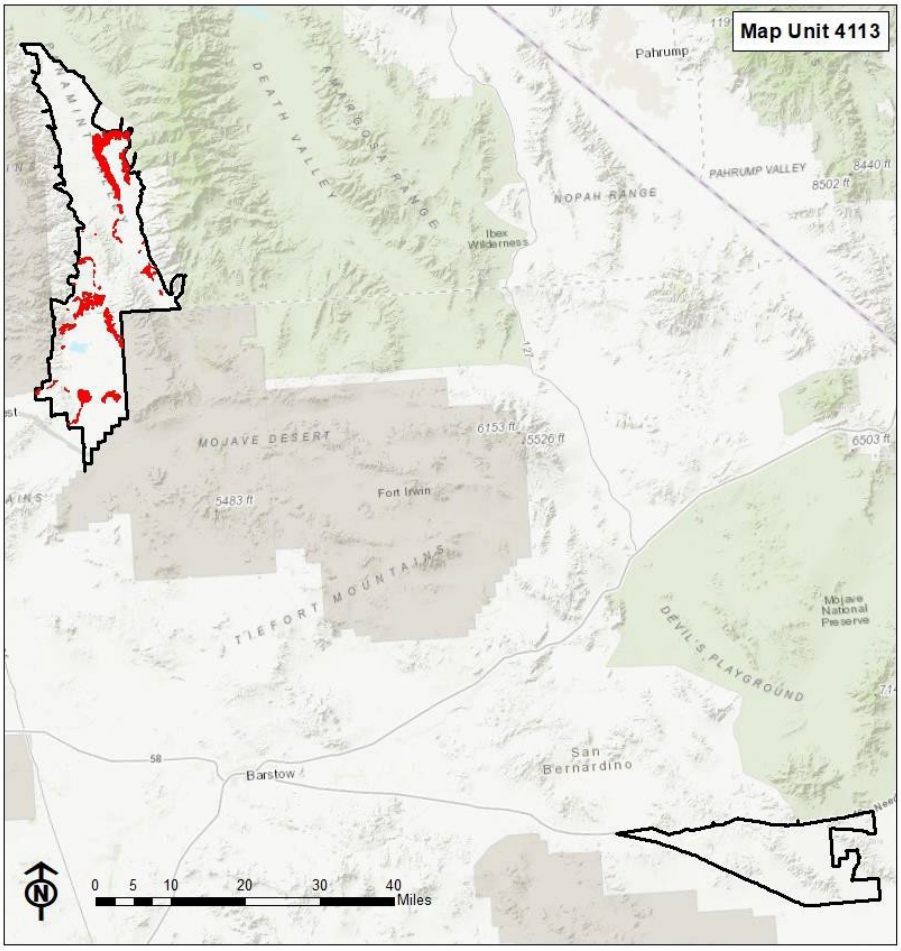
DESCRIPTION: This alliance is mapped where *A. polycarpa* dominates the shrub layer, usually with 2 percent absolute cover or more, and greater than 50 percent of the relative shrub cover. Stands can occur on broad flats, in washes, on steep volcanic ravines and slopes, and as disturbance stands in human affected areas. This species is typically found scattered along broader washes and on adjacent terraces. It may occur on playa edges, in washes through alkaline areas, or occasionally on uplands with alkaline or somewhat saline substrate. Although found within a wide spectrum of soil chemistry, this species generally favors less alkalinity or salinity than other salt-tolerant scrub and therefore is usually found along the outermost edges of the playa complex. In this alliance, *Atriplex polycarpa* is always dominant in the shrub canopy if these shrubs are present: *Ambrosia dumosa*, *Ambrosia salsola*, *Atriplex canescens*, *Chamaesyce polycarpa, Cleome isomeris*, *Isocoma acradenia*, and *Larrea tridentata*. Where *Atriplex polycarpa* is co-dominant with *Larrea tridentata*, then the stand is considered as the *Larrea tridentata* Alliance. Rarely, *Ambrosia dumosa* may be co-dominant with *Atriplex polycarpa* and is part of this alliance. Emergent *Prosopis glandulosa* trees may be present at low cover. Where *Atriplex spinifera* is co-dominant with *A. polycarpa*, the alliance is *Atriplex spinifera*.

PHOTOINTERPRETATION SIGNATURE: Stands range from sparse to dense cover with a wide range of colors that vary from white to dark gray to a bluish gray to brown. Shrubs tend to have a coarser texture when they congregate into dense clumps and/or semi-continuous stands that establish on a wide range of settings.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

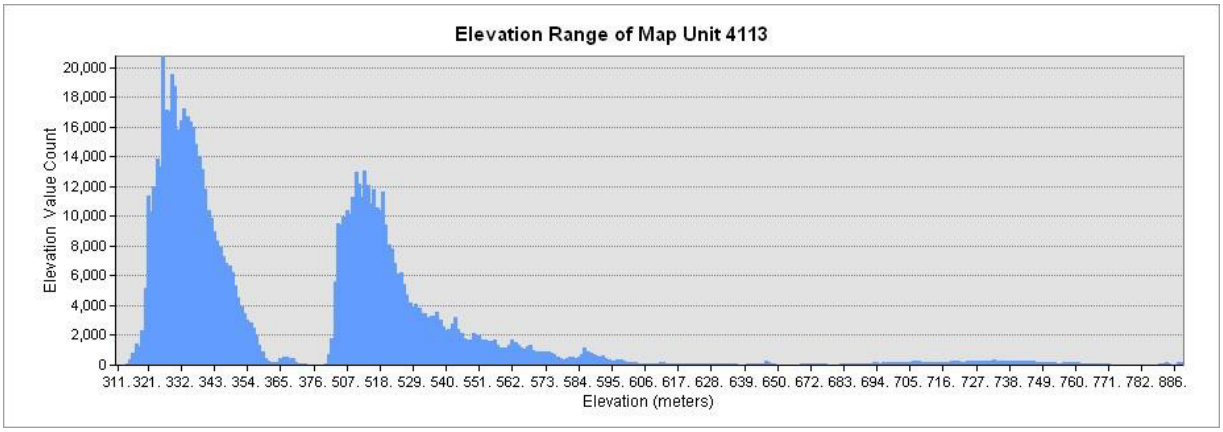
- *Ambrosia dumosa* Alliance (4111) – These shrubs are typically smaller sized individuals with a lighter white or gray color and are commonly associated with *Larrea tridentata*. They are more often found farther away from playa systems in non-alkaline settings.
- *Ambrosia salsola – Bebbia juncea* Alliance (7211) – The shrubs also occur in wash or wash terrace settings and disturbance sites. The signature has a similar light gray or tan color with a slightly smaller, more diffuse crown.
- *Atriplex confertifolia* Alliance (5112) – Very commonly occurring around scalds and playas, these shrubs are smaller in size, grow in more open, spread-out patterns and appear tan to gray in color. They are not typically found in wash settings.

***Atriplex polycarpa* Alliance (4113)**



DISTRIBUTION: *Atriplex polycarpa* has the broadest ecological distribution and the highest shrub cover of any of the *Atriplex* species in the desert. This alliance is distributed throughout much of the Western and Central Mojave Deserts where playa systems are frequent and extensive, lying between the upland desert scrub (*Larrea tridentata – Ambrosia dumosa)* and the more alkaline salt scrub vegetation closer to the margins of playas. To a lesser extent it can be found along washes, disturbed, and agricultural sites. *A. polycarpa* is uncommon in the Sonoran Desert. It is also found in small patches at the base of the bluffs adjacent to the Colorado River floodplain. In the current study area, *Atriplex polycarpa* rings Panamint playa on the north, west and south, and rings the Searles playa on the north and south. It is also mapped in the Poison Canyon wash, as well as the wash flowing into Searles playa from Homewood Canyon in Argus Range in the Searles Valley subarea. This alliance is not mapped in the West Mojave Trails A subarea.

***Atriplex polycarpa* Alliance (4113)**



Cylindropuntia acanthocarpa/Pleuraphis rigida Alliance (4161)

Buckhorn cholla/Big galleta grass scrub Alliance

An aerial view of the *Cylindropuntia acanthocarpa/Pleuraphis rigida* Alliance, also referred to as “Cactus Garden” noted along the north side of Interstate 40.

A ground photo of the Cactus Garden on rocky substrate with a number of cactus species including *Opuntia* spp., *Cylindropuntia* spp. and *Ferocactus* spp., as well as *Yucca schidigera, Krameria erecta*, and *Eriogonum fasciculatum*.

Cylindropuntia acanthocarpa/Pleuraphis rigida Alliance (4161)

DESCRIPTION: *Cylindropuntia acanthocarpa* ≥2 percent cover and co-dominant often with other succulent species such as *C. echinocarpa, C. ramosissima, Ferocactus cylindraceus,* and *Opuntia basilaris* along with lower cover of other shrubs such as *Ambrosia dumosa, Eriogonum fasciculatum, Krameria erecta,* and *Yucca schidigera. Pleuraphis rigida* may also be present. Stands appear transitional between lower bajada scrub and mid-elevation mixed scrub, and they and may be present due to past disturbance. This alliance is sometimes referred to as a "Cactus Garden".

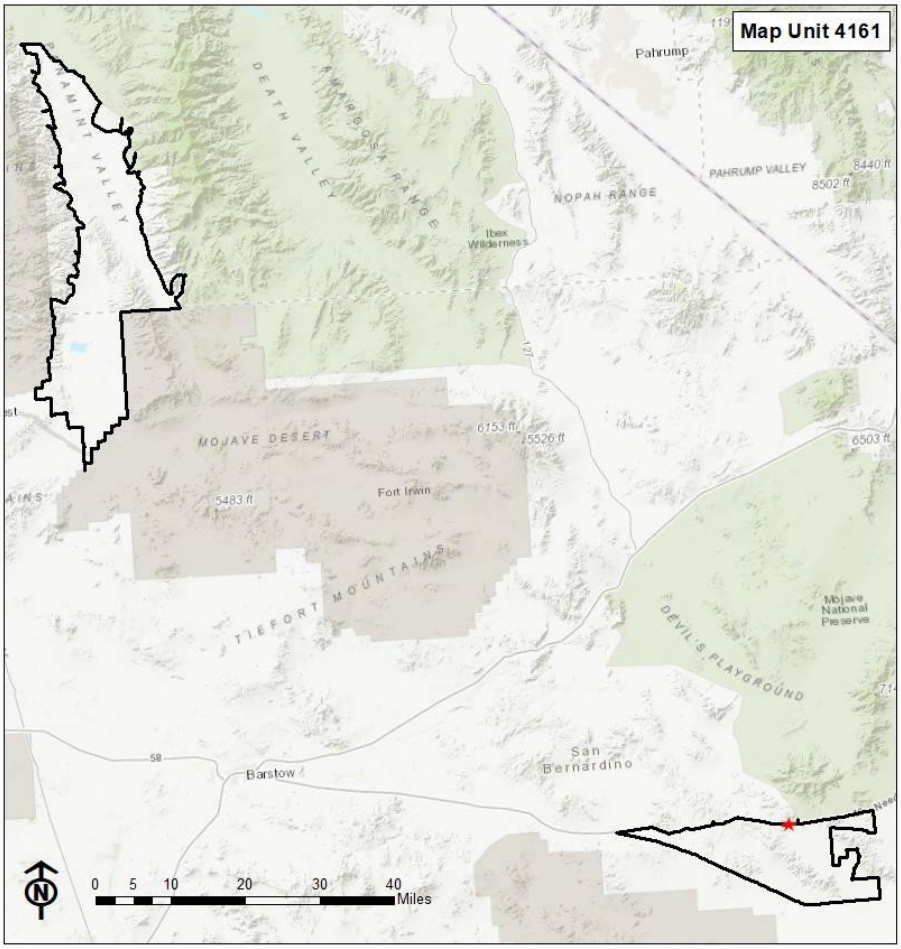
Note: As part of this project effort, additional classification data collection and analysis were performed for the Searles Valley, West Mojave Trails A, Jawbone South, and Owens Valley subareas. Floristic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Cylindropuntia acanthocarpa/Pleuraphis rigida* Alliance (4161) was added to the DRECP classification.

PHOTOINTERPRETATION SIGNATURE: Since the species occurring in this alliance tend to be small and sparse, photointerpretation is difficult. Individuals are dark green to brown in color with a rounded crown, many appearing as dark specks. Occurs on hard substrate,

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

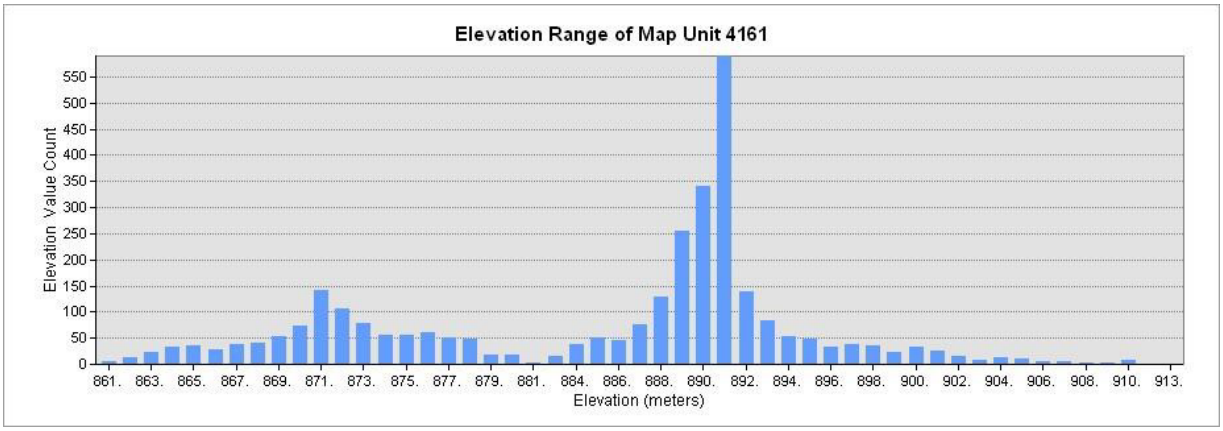
- *Larrea tridentata – Ambrosia dumosa* Alliance (4119) – Occasional *Larrea tridentata* and/or *Ambrosia dumosa* may occur within the *Cylindropuntia acanthocarpa/Pleuraphis rigida* Alliance stand. *Larrea tridentata – Ambrosia dumosa* Alliance has even distribution of *Larrea* and *Ambrosia* and typically has not or few occasional cactus species.
- *Yucca schidigera* Alliance (5424) – Occasional *Yucca schidigera* may occur within the *Cylindropuntia acanthocarpa/Pleuraphis rigida* Alliance stand. *Yucca schidigera* Alliance has even distribution of *Yucca schidigera*. The more plentiful *Yucca schidigera* signatures are dark brown to black and appear as a very short linear "dash" representing the shadow cast by the plant, whereas the cactus plants are rounded.

***Cylindropuntia acanthocarpa/Pleuraphis rigida* Alliance (4161)**



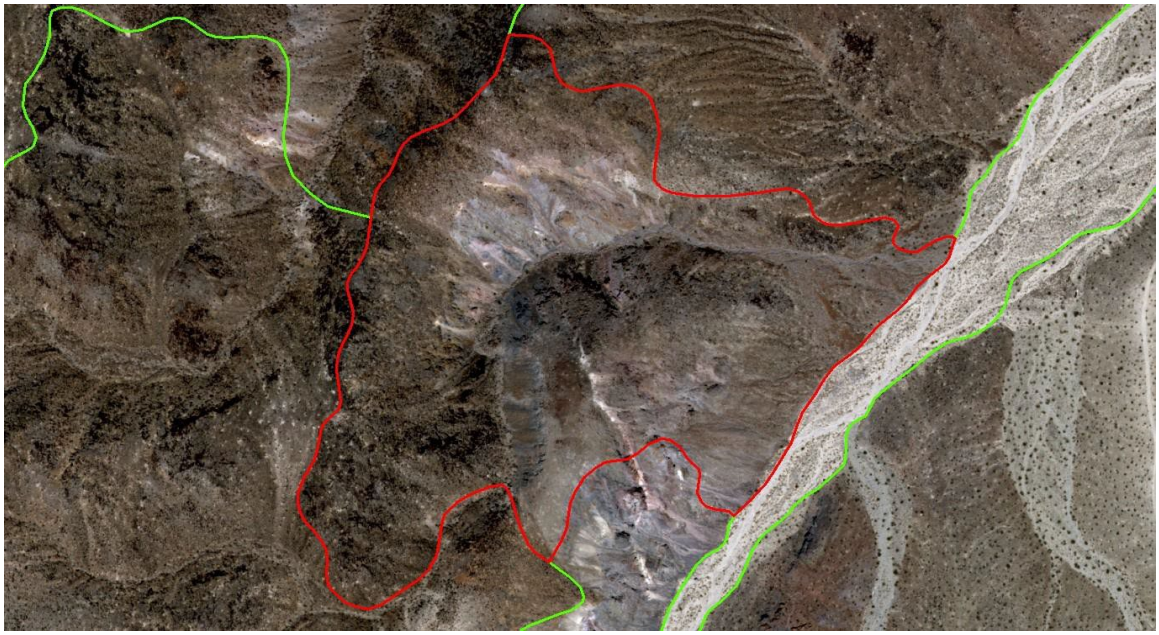
DISTRIBUTION: The *Cylindropuntia acanthocarpa/Pleuraphis rigida* Alliance has not been mapped on previous DRECP projects, since it is new to the classification. In the current study area, it occurs in the West Mojave Trails A subarea as a few sites on the edge of the Interstate 40 freeway on the edge of the study area adjacent to the Mojave National Preserve. It is not mapped in the Searles Valley subarea.

***Cylindropuntia acanthocarpa/Pleuraphis rigida* Alliance (4161)**



Encelia farinosa Alliance (4114)

Brittle bush scrub Alliance



The aerial view shows a stand of *Encelia farinosa* Alliance, outlined in red, occurring on hot, exposed, steep, rocky volcanic slopes. Note the small light-colored shrubs in this image.

The ground photo shows small, light-colored tawny *Encelia farinosa* throughout these slopes.

Encelia farinosa Alliance (4114)

DESCRIPTION: *Encelia farinosa* is the dominant species, at greater than or equal to 2 percent cover, and with no other species having equal or higher cover. *Ambrosia dumosa* and *Fagonia laevis* have been noted as associated species. *Larrea tridentata* is largely absent to sub-dominant. *Ambrosia dumosa* may co-dominate. This alliance occurs mainly on mid to upper (most exposed) south-facing slopes on hot and dark rocky substrate of the low-elevation interior desert mountains. Stands are usually bordered by the *Larrea tridentata* – *Encelia farinosa* Alliance on slightly less-exposed slopes (lower or less steep adjacent slopes) and giving way to *Larrea tridentata* – *Ambrosia dumosa* Alliance on more neutral slopes. The best method in determining the presence of *E. farinosa* in the Mojave Desert is elevation and regional distribution. With the exception of a few stands in the southern Searles Valley, nearly all stands are east of Barstow and below 3000 feet (920 meters) in elevation.

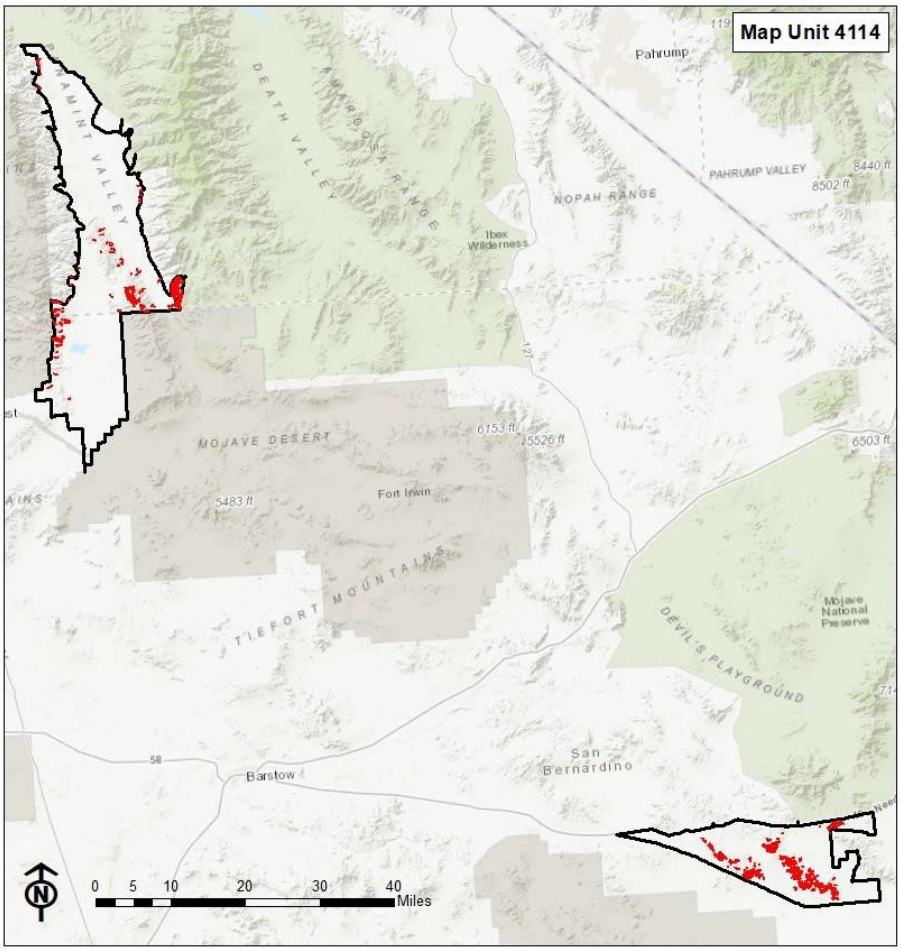
Note: There is criteria change from previous DRECP mapping where *Encelia farinosa* was dominant at greater than 1 percent. (Menke et al., 2013).

PHOTOINTERPRETATION SIGNATURE: Cover ranges from sparse to moderately dense and varies considerably as subtle characteristics of the topography change across the stand. Individual plants tend to be light gray and have a fairly well-defined crown. Darker substrate (metamorphic and desert pavement) accentuate the light gray color of the shrubs. However, stands are difficult to discern when occurring on lighter-colored substrate. In the northern portions of its range, its distribution is limited by topographic features, and is found mainly on mid to upper steep exposed south-trending slopes below 2700 feet (820 meters).

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

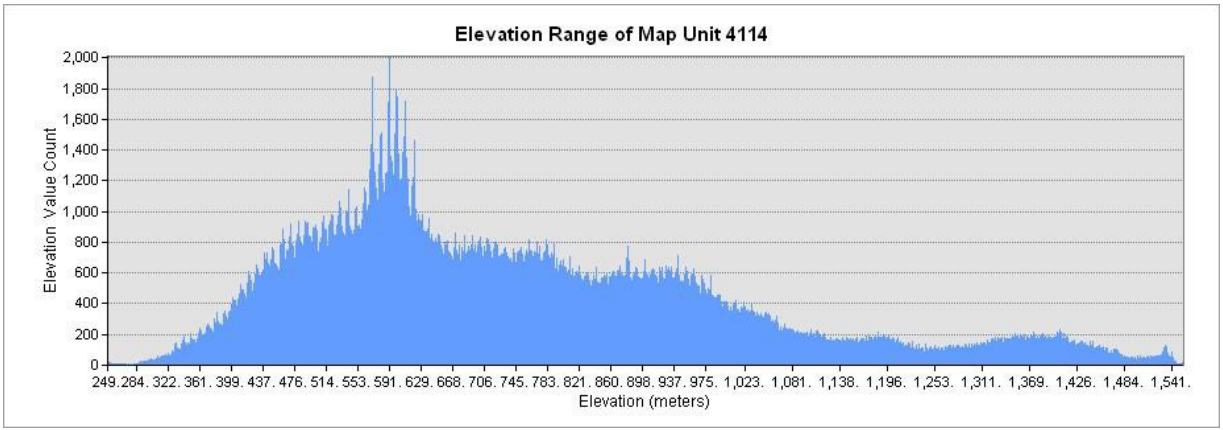
- *Ambrosia dumosa* Alliance (4111) – *Ambrosia dumosa* is more likely found on higher elevation south-facing mountain slopes, and some stream terraces on the fans and bajadas. It is less likely to dominate the small rills that dissect desert pavement. At times, it can be found on steep, lighter-colored exposed slopes over marble and limestone substrate.
- *Atriplex hymenelytra* Alliance (6111) – Signature differences between these two shrubs are difficult to discern. *A. hymenelytra* tends to remain consistent in cover across the stand, while *Encelia farinosa* varies based on soil development along the slopes. *E. farinosa* almost always occurs on higher slope positions and is less common on basalt-formed volcanics.
- *Atriplex polycarpa* Alliance (4113) – This alliance is occasionally found in mountainous terrain on dark volcanic rock with alkaline-trending soils in the Mojave Desert. Signature color is similar to *Encelia farinosa;* however, crown sizes average somewhat larger. In these settings, stands more frequently follow small rivulets on steep slopes where cover is dense but restricted in extent.
- *Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419) – In this project, this alliance is found on well-protected upper north-facing mountain slopes at higher elevations.

Encelia farinosa Alliance (4114)



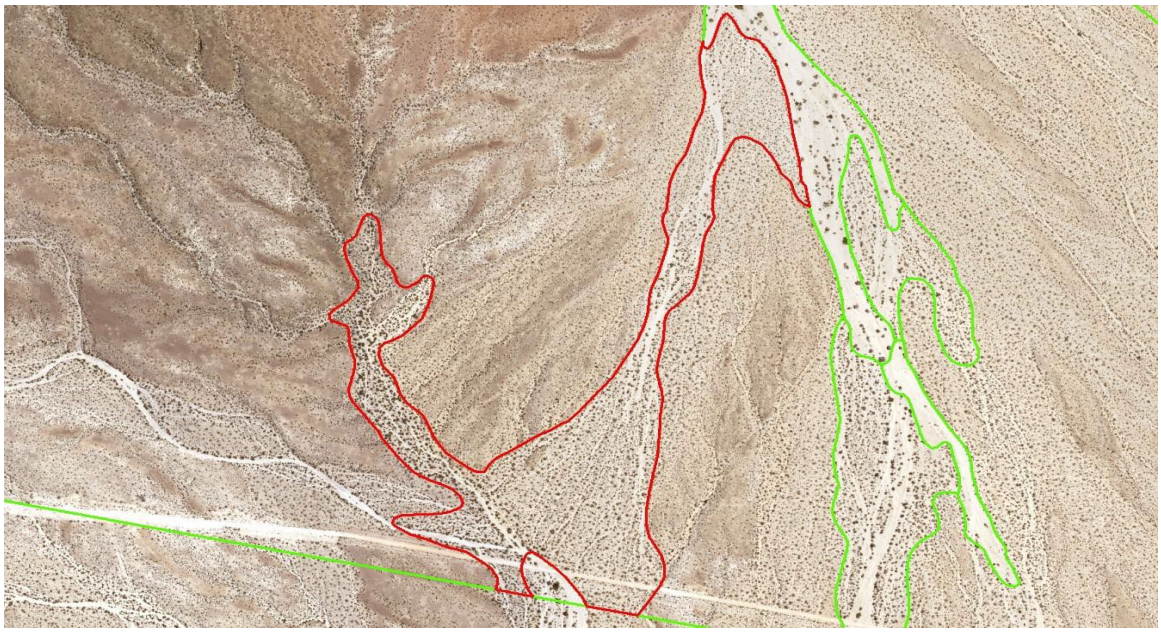
DISTRIBUTION: The *Encelia farinosa* Alliance has its highest concentration of stands in the upper elevations of the mountains of the Colorado Desert, as well as in the Pinto Mountains southeast of the Twentynine Palms area. Stands also occur on mid to upper (most exposed) south-facing and hottest slopes in the Central and Eastern Mojave region. In the current study area, in the Searles Valley subarea, the alliance is mapped at the north end of the Panamint Valley on lower slopes of Lookout Mountain and Ash Hill. In the Panamint Range it is mapped on the lower slopes between Pleasant Canyon and South Park Canyon, and on the slopes north and south of Crescent Mine. It is also mapped on the upper ridges and slopes of the Slate Range, and on the lower slopes of the Argus Range. A few sites are mapped in the vicinity of the Trona Pinnacles Recreation Area. In the West Mojave Trails A subarea, the alliance is mapped generally on south-facing slopes of the Bristol Mountains, Marble Mountains, Lava Hills, and Black Ridge.

Encelia farinosa Alliance (4114)



Ephedra californica – Ephedra trifurca Alliance (4211)

California joint fir scrub Alliance



This aerial view shows the larger dark green individual shrubs of *Ephedra californica* growing in the rill and wash system northeast and adjacent to the Marble Mountains.

Ground view of a stand of yellow-green *Ephedra californica* consistently scattered over a sheetwash fan, with *Larrea tridentata, Ambrosia dumosa*, and *Ambrosa salsola*.

Ephedra californica – Ephedra trifurca Alliance (4211)

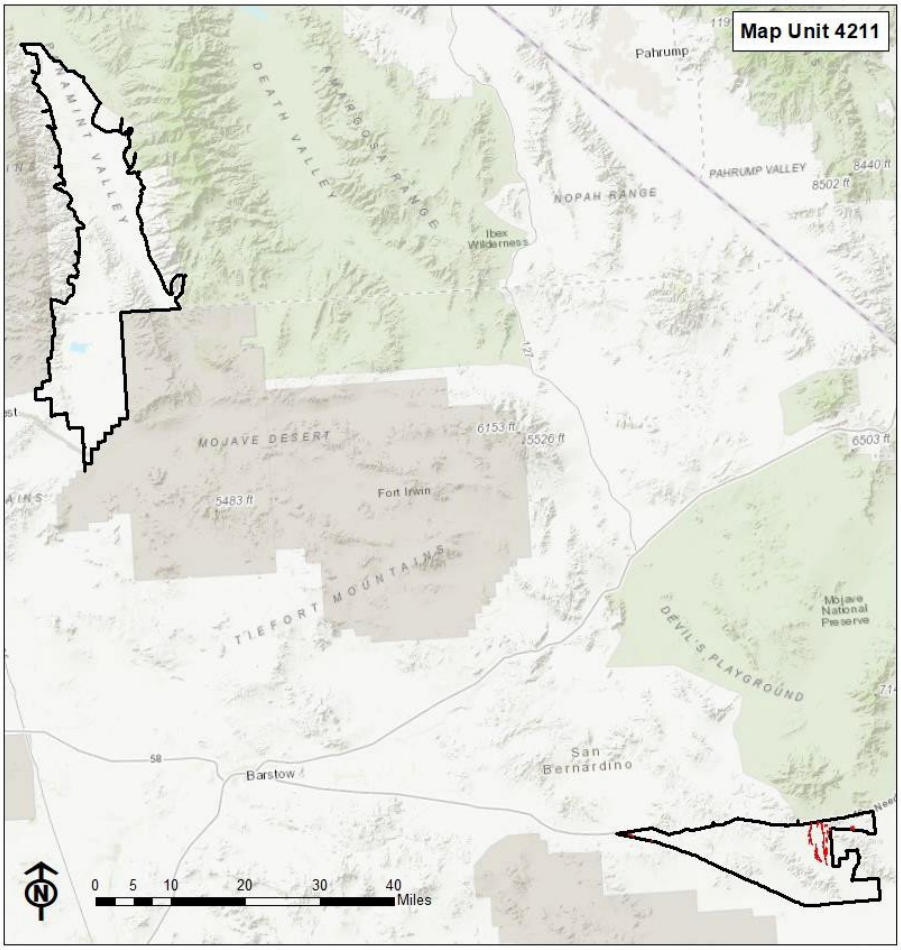
DESCRIPTION: In this alliance *Ephedra californica* or *Ephedra trifurca* dominates, or co-dominates with *Ambrosia salsola, Senna armata. Ephedra californica* is typically found on broad, active washes of mid to upper bajadas and fans, and this species may be confused with the similar *Ephedra trifurca* of washes and sand dunes from Barstow eastward. *E. trifurca* is characteristic of low dunes and sand sheets in the Colorado Desert but generally attains higher cover than vegetation types in the lithomorphic class that includes sparsely vegetated dunes. Due to similar ecology, both species are treated together in this alliance. Stands dominated by *Senna armata,* with either species of *Ephedra* intermixing as an evenly distributed and important shrub, are also currently placed in this alliance (new evidence, following the conclusion of the field work for this project, suggests *Senna armata* may be a separate type). *Ephedra trifurca* does not occur in the Searles Valley or West Mojave Trails A subareas.

PHOTOINTERPRETATION SIGNATURE: The stands are typically open to moderately dense with a color variation from gray to green. Individuals have a dense crown with well-defined edges and grow in evenly spaced and/or clonal ring patterns. Shrubs tend to be medium to large and spreading with a very sparse herbaceous understory. The dark-colored shrubs contrast markedly with the white sandy or rocky substrate on which *Ephedra* frequently occurs.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

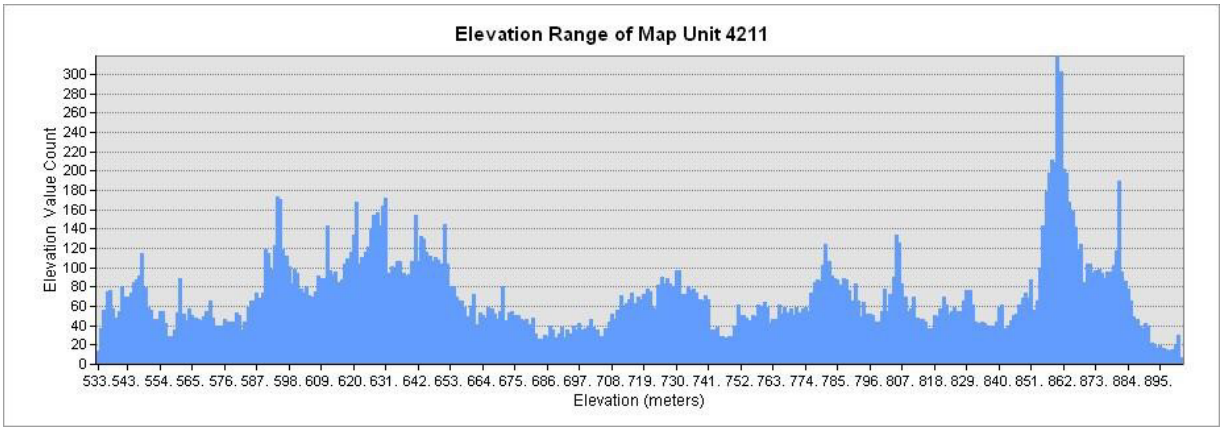
- *Acacia greggii – Hyptis emoryi – Justicia californica* Alliance (4226) – Crowns of *Acacia greggii* are not as dense and have less distinct edges. *A. greggii* tend to grow in small but dense inconsistent patches along wash margins.
- *Ambrosia salsola – Bebbia juncea* Alliance (7211) – These plants are not as large or rounded, and the edges of the crown appear fuzzier and less defined.
- *Larrea tridentata* Alliance (4119) – *L. tridentata* tends to have an uneven, fuzzier-edged, more open crown, and has a duller green color. When the two alliances are nearby in similar settings, shrubs in both types are quite large. In these situations, the above-described crown features make distinguishing the two types fairly straightforward.
- *Peucephyllum schottii – Pleurocoronis pluriseta* Alliance (6118) – *Peucephyllum schottii* individual shrubs are irregularly shaped and appear dark green to black, with a more open crown. Shrubs can vary in size, but are typically large.

Ephedra californica – Ephedra trifurca Alliance (4211)



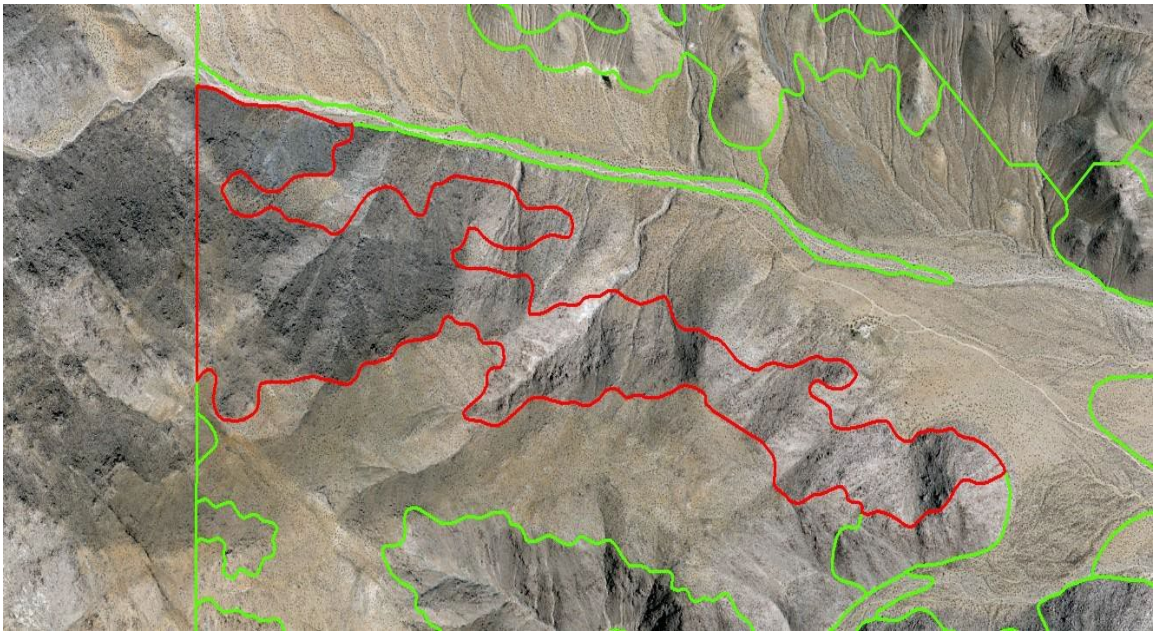
DISTRIBUTION: The highest concentration of stands occurs in small washes in the Central Mojave Desert and north of the San Bernardino Mountains. *Ephedra trifurca* is identified on dunes west of the Parker Valley portion of the Colorado River and on several long, narrow sand sheets just west of the Algodones Dunes in the Salton Sea Trough zone. In the current study area, the alliance is mapped in the West Mojave Trails A subarea in linear washes in the valley between the Marble and Bristol Mountains. A few sites are also mapped in washes between Ludlow and Ash Hill along Route 66. It is not mapped in the Searles Valley subarea.

***Ephedra californica – Ephedra trifurca* Alliance (4211)**



Ephedra nevadensis – Lycium andersonii – Grayia spinosa Alliance (5419)

Nevada joint-fir – Anderson's boxthorn – Spiny hopsage scrub Alliance



Shown above is an aerial view that is a representative example of stands of *Ephedra nevadensis* on a middle to upper steep northerly slope.

Ground photo of a stand of *Ephedra nevadensis*, on a steep northerly slope.

***Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419)**

DESCRIPTION: *Ephedra nevadensis, Lycium andersonii* and/or *Grayia spinosa* are dominant or co-dominant with greater than 2% cover in the shrub canopy, and no other species with greater cover with the exceptions of *Acamptopappus sphaerocephalus, Ambrosia salsola, Ericameria cooperi, Picrothamnus desertorum, Salazaria mexicana, Tetradymia* spp., or *Chrysothamnus viscidiflorus*. In addition*, Ericameria cooperi* can be evenly distributed and dominant to co-dominant with other shrubs including *Atriplex* spp., *Ephedra nevadensis, Grayia spinosa*, and/or *Lycium andersonii* in rocky often volcanic hills and slopes, or *Lycium cooperi* can be dominant and evenly distributed across the stand, or it is co-dominant with *Ambrosia salsola*.

PHOTOINTERPRETATION SIGNATURE: *Ephedra nevadensis* has a wide range of signature characteristics depending on the settings in which they occur. In post fire disturbance, *E. nevadensis* forms a dense cover, often with a variable component of other shrubs. In these situations, the modal signature is due to the high cover of *E. nevadensis,* which has a light to dark gray color. Mature individuals have a fairly distinct, irregularly shaped spreading crown, rarely over one meter high. Stands on high mountain slopes are generally sparse in cover and yield little vegetative signature. These stands are difficult to differentiate from other shrubs within the Intermontane scrub Group and are best separated out by their distinguishing topographical characteristics (higher elevation, north-trending aspects), slope steepness, and substrate. In post-fire regeneration, *Ephedra nevadensis* has a significantly smaller crown, and shrub cover is notably sparser. When shrubs form fairly large stands, relative cover differentiations between the species prove to be a challenge since multiple gray signatures mosaic and mix closely together.

Ericameria cooperi stand cover ranges from sparse to dense. Individual shrubs are generally small, rounded, and have a medium-green color. Stands with higher cover tend to have a more recognizable green signature, which distinguishes *E. cooperi* from other seral shrub types. This species often occurs in small patches intermixing with other species close by, such as *Eriogonum fasciculatum, Artemisia tridentata,* and/or *Prunus fasciculata. Ericameria cooperi* tends to present a rather stippled texture, unlike the clonal patchy texture found in stands of *Ephedra nevadensis.*

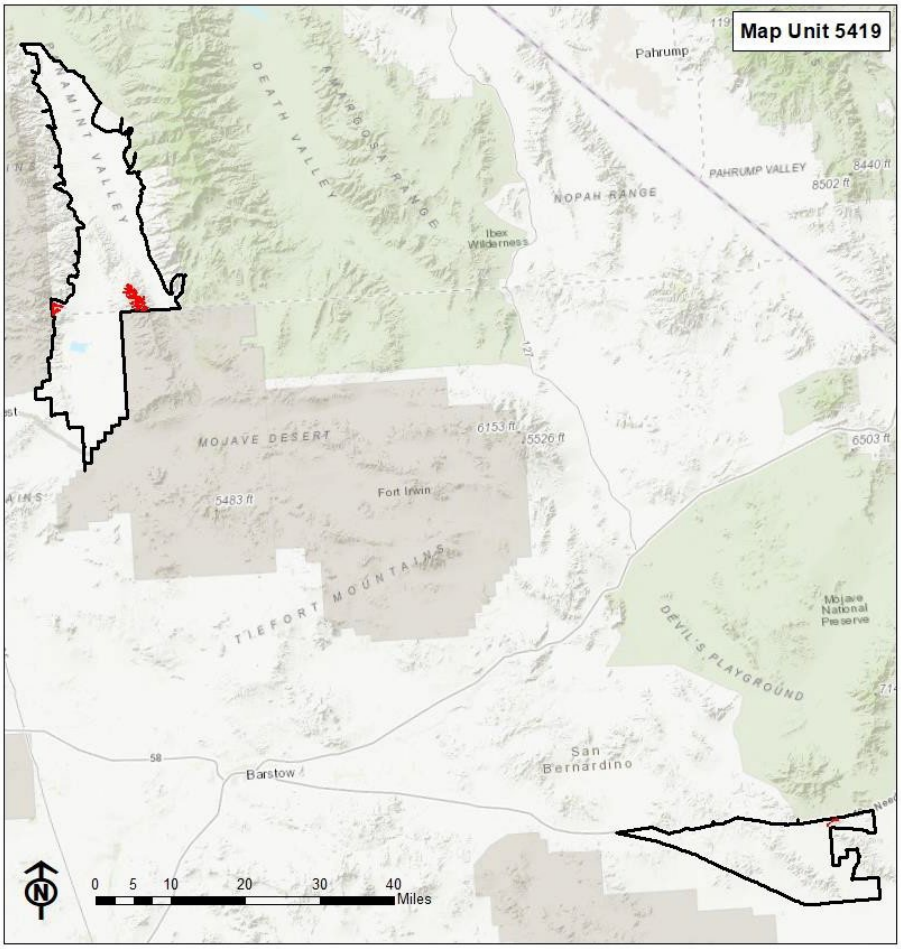
Grayia spinosa stands range from open to very dense in cover. Individuals are light gray in color with a diffuse crown. In healthy, relatively undisturbed stands, shrub cover is fairly consistent throughout and individual crown size varies little. Signature variability increases in disturbance settings due to the higher diversity of shrub species present and greater inconsistency in woody vegetative cover density across the stand. Stands on broad alluvial fans often have a component of *Yucca brevifolia,* which contrasts sharply with the overall light gray color of the understory shrub layer.

***Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419)**

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

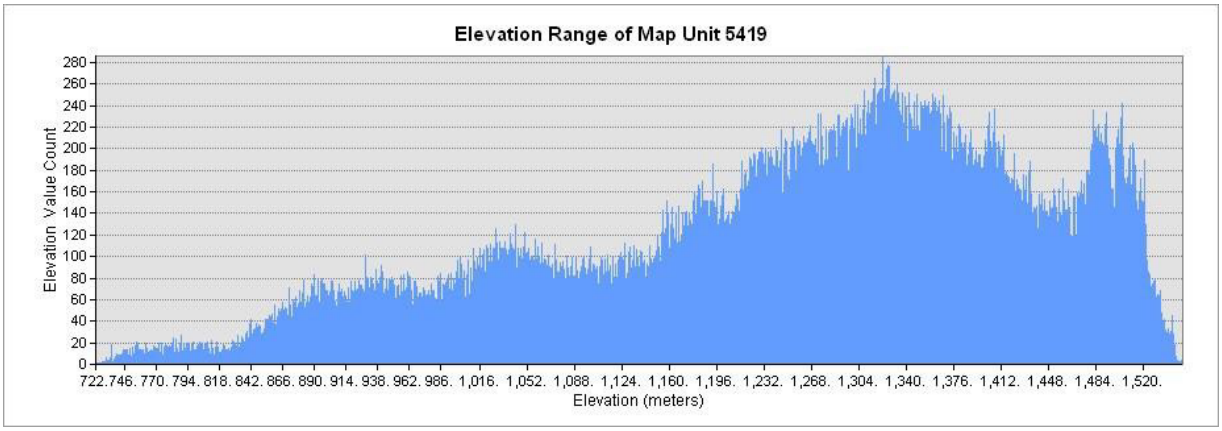
- *Ambrosia dumosa* Alliance (4111) – The signature of this type is very similar to *Grayia spinosa,* and differences between stands are especially difficult to discern where the two species co-occur. *Ambrosia dumosa* tends to have a smaller crown. *Grayia spinosa* tends to occur on north faces at higher elevations, whereas *Ambrosia dumosa* may tend to be found on the south-facing slopes.
- *Encelia farinosa Alliance (4114)* – This alliance occurs mainly on mid to upper (most exposed) south-facing slopes on hot and dark rocky substrate of the low-elevation interior desert mountains, typically below 3000 feet (920 meters). Individual plants tend to be light gray and have a fairly well-defined crown. Darker substrate (metamorphic and desert pavement) accentuate the light gray color of the shrubs.

***Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419)**



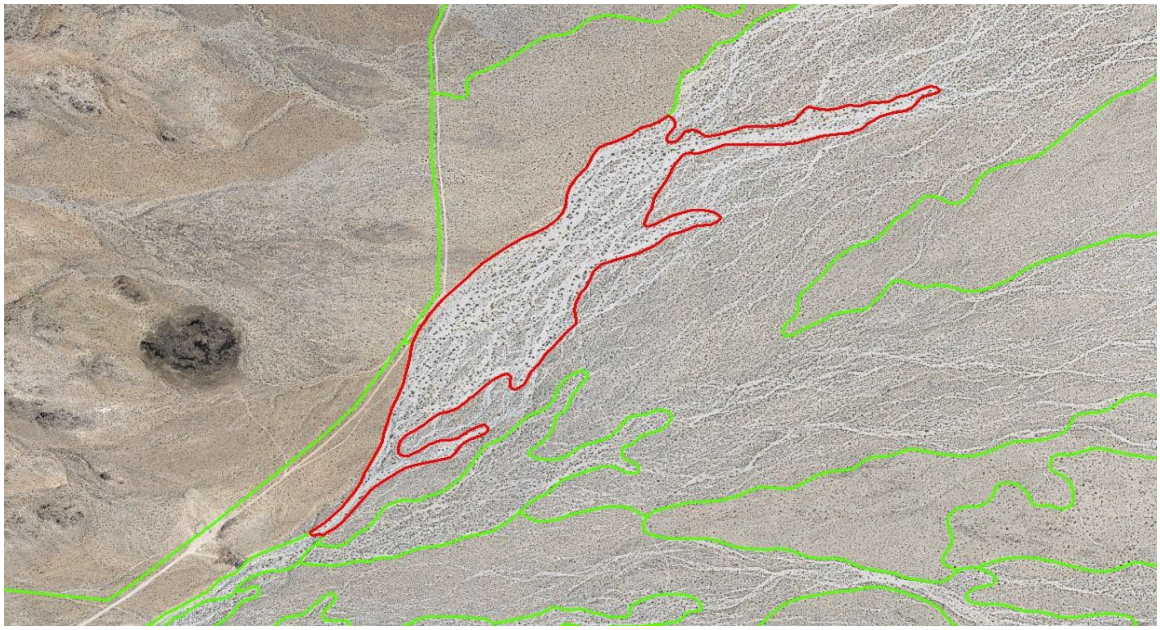
DISTRIBUTION: This alliance is mapped at higher, cooler elevation mountains and fans of the Mojave Desert. It can be a mix of many mid to upper elevation species. In the current study area, in the Searles Valley subarea, this alliance is mapped on north faces in upper elevations of the Slate Range, and on a few lower north faces in Argus Range northwest of Pioneer Point. In the West Mojave Trails A subarea, it is mapped at two sites on north faces of the Marble Mtns.

***Ephedra nevadensis – Lycium andersonii – Grayia spinosa* Alliance (5419)**



Ericameria paniculata Alliance (4213)

Blackstem rabbitbrush Alliance



The aerial image shows a wide wash containing the dark green-colored *Ericameria paniculata* scattered intermittently along the main stream channels.

The ground photo displays dense gray-green *Ericameria paniculata* shrubs occupying a braided lower-energy wash.

***Ericameria paniculata* Alliance (4213)**

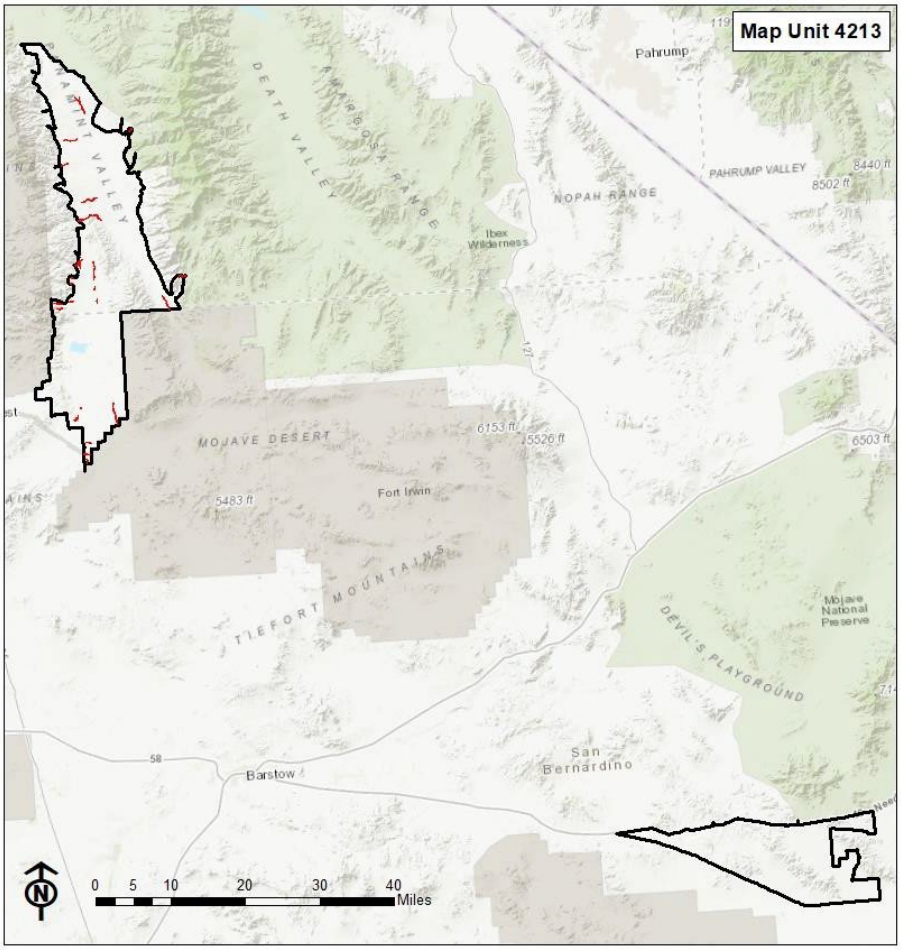
DESCRIPTION: This alliance is mapped where *Ericameria paniculata* is dominant or co-dominant in the shrub canopy. *E. paniculata* comprises 2 percent of the absolute cover or more and/or at least 25 percent of relative cover. It is widespread throughout a broad elevation range in much of the Mojave Desert on the edges and terraces of relatively large, recently active washes. If *E. paniculata* is mixed with *Lepidospartum squamatum*, it must be more than twice the cover of *L. squamatum* to be assigned to this alliance. If a stand is below MMU and adjacent to a *Chilopsis linearis* stand, it is subsumed into the *Chilopsis* map polygon.

PHOTOINTERPRETATION SIGNATURE: Stands are sparse to moderately dense in cover with larger mature shrubs appearing green to dark green in color with a dense rounded crown. Typically, shrubs are intermittently spaced in larger wash braids and relatively low-energy wash channels that contain a sparse herbaceous understory.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

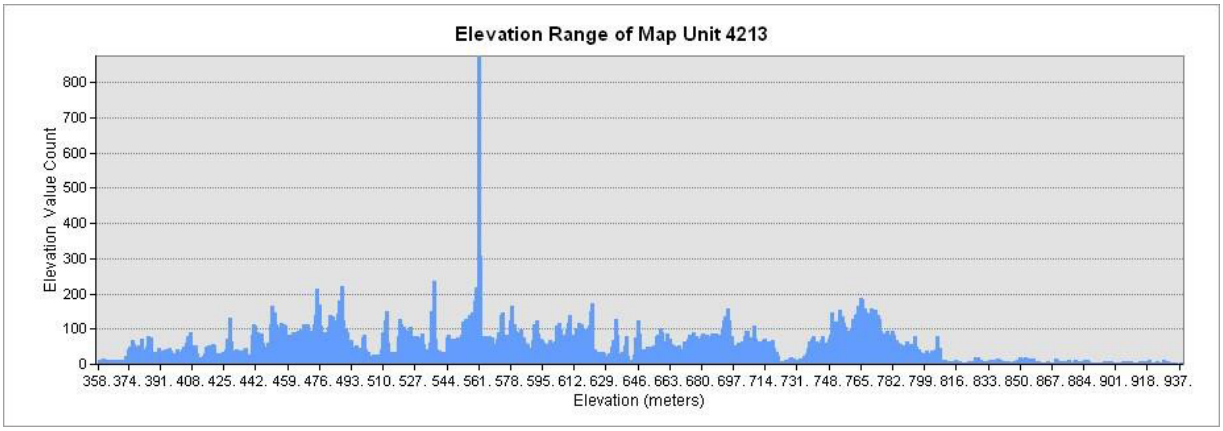
- *Ambrosia salsola – Bebbia juncea* Alliance (7211) – *Ambrosia salsola* is grayer in color and tend to dominate in less active parts of drainages (i.e. stream terraces, sheet wash areas).
- *Chilopsis linearis – Psorothamnus spinosus* Alliance (7222) – *Psorothamnus spinosus* is larger crowned, less rounded, and tend to have a lighter gray color. They occur in more active portions of the stream channel.
- *Ephedra californica – Ephedra trifurca* Alliance (4211) – *Ephedra californica* tends to average slightly greener, have a more irregularly shaped crown, and occupy washes with a sandier substrate.
- *Lepidospartum squamatum* Alliance (4212) – These shrubs are indistinguishable on aerial imagery and can be hard differentiating in the field. *Lepidospartum squamatum* generally prefers higher energy washes. Otherwise, these plants are difficult to discern from *E. paniculata* due to their similar crown shape, texture and setting. Stands are more common in the western sections of the Mojave Desert.

***Ericameria paniculata* Alliance (4213)**



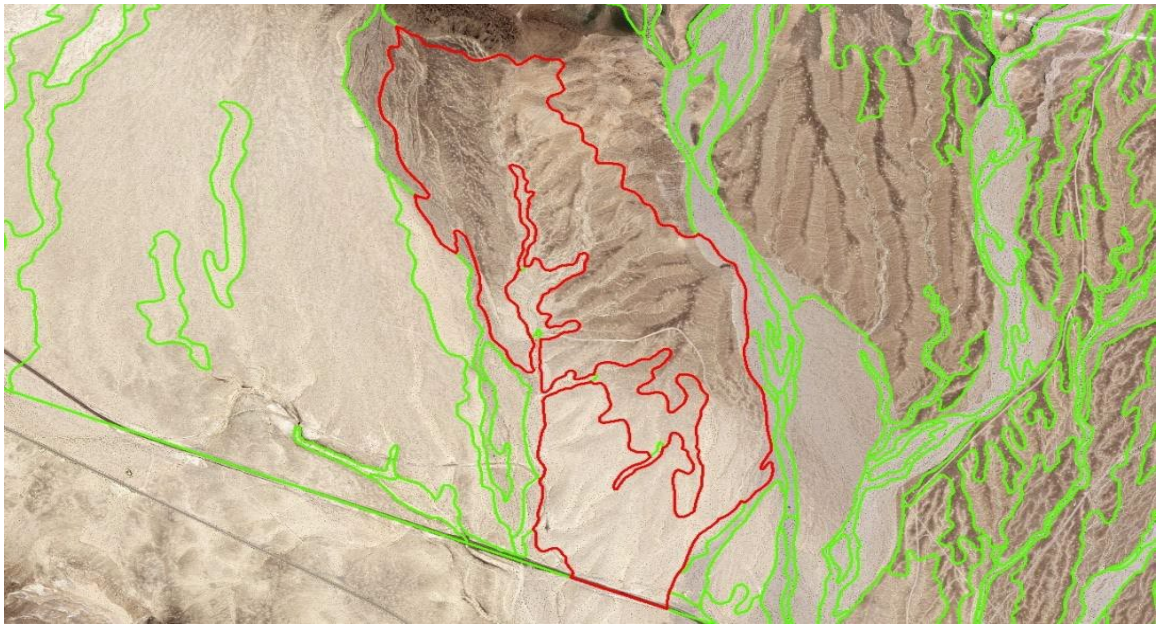
DISTRIBUTION: This alliance has the highest concentration of stands in desert washes in the Central Mojave region. Fewer localized stands occur in narrow desert mountain arroyos in the northern Mojave Desert – Basin and Range Fringe zone. The regional distribution of this type is centered in the Great Basin and Eastern Mojave regions outside this study area. In the current study area, in the Searles Valley subarea, this alliance is mapped in washes in the Searles and Panamint Valleys. Some washes originate all along the Argus Range into the Panamint and northern Searles Valleys. A couple of washes are found at the northern and southern ends of the Panamint Range, and a few are noted at the southern end of the Searles Valley. This alliance was not mapped in the West Mojave Trails A subarea.

***Ericameria paniculata* Alliance (4213)**



Larrea tridentata Alliance (4119)

Creosote bush scrub Alliance



Aerial view of *Larrea tridentata* Alliance on hard surface older alluvium terrace south of the Bristol Mountains east of Ash Hill.

The ground photo depicts an upper fan dominated by evenly spaced rather short *Larrea tridentata* over a low to moderately dense herbaceous understory on a gravelly surface.

***Larrea tridentata* Alliance (4119)**

DESCRIPTION: In this alliance *Larrea tridentata* is the dominant shrub with at least 2 percent cover (1 percent in sparse stands) and is evenly distributed in the stand. *Ambrosia dumosa* or *Encelia farinosa* are sub-dominant, if present. Shrubs present may include *Krameria* spp., *Bebbia juncea*, *Ericameria teretifolia*, *Acamptopappus sphaerocephalus*, *Ephedra nevadensis,* or *Cylindropuntia acanthocarpa.* This species readily establishes on a wide variety of settings, including steep mountains slopes, more gradual alluvial fans, and in flats above the valley bottoms. Upper fans at higher elevations and transition zones moving away from playas tend to have greater diversity, with a variety of subshrub species mixing into the stand. Stands of this alliance that are affected by fire, grazing, off-highway vehicle use or urban clearing frequently occur on lower bajadas and adjacent flats, where non-native annuals often dominate the herbaceous layer. In these settings, the understory shrub layer is discontinuous, and *Larrea tridentata* strongly dominates the shrub canopy. The presence of this alliance can indicate a disturbance history where the more modal *Larrea tridentata – Ambrosia dumosa* Alliance stands have been degraded (Sawyer, Keeler-Wolf and Evens, 2009). On deeply incised upper fans with old impervious surfaces, especially in the Colorado Desert adjacent to the lower slopes of the desert mountains, *L. tridentata* occurs in sparse cover generally between 2 and 5 percent. In these settings, *L. tridentata* is often the only shrub occurring in the stand. Where *Larrea tridentata* occurs in a wash or terrace setting with a co-dominance of *Ambrosia salsola* and very little *Ambrosia dumosa*, the stand is mapped to the *Ambrosia salsola – Bebbia juncea* Alliance.

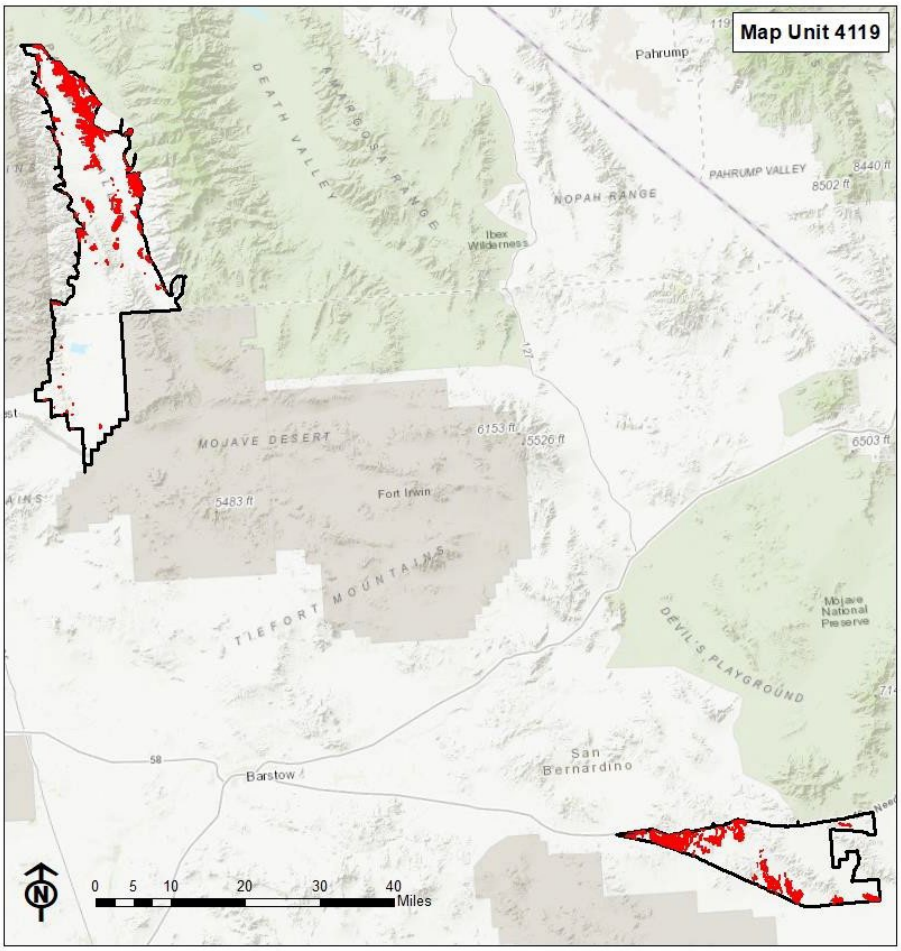
Note: There is criteria change from previous DRECP mapping where co-dominance of *Larrea tridentata* with *Ambrosia salsola* was mapped as the *Larrea tridentata* Alliance (Menke et al., 2013).

PHOTOINTERPRETATION SIGNATURE: These widely varying sized shrubs appear dark brown to green (depending on water availability) with a diffuse crown edge. Stand cover may be sparse to moderately dense, with individuals spaced evenly apart and emergent over an herbaceous or subshrub understory. Stands with a dense herbaceous understory often have an extensive tan to yellow hue of varying brightness due to the high cover of the annual grasses.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

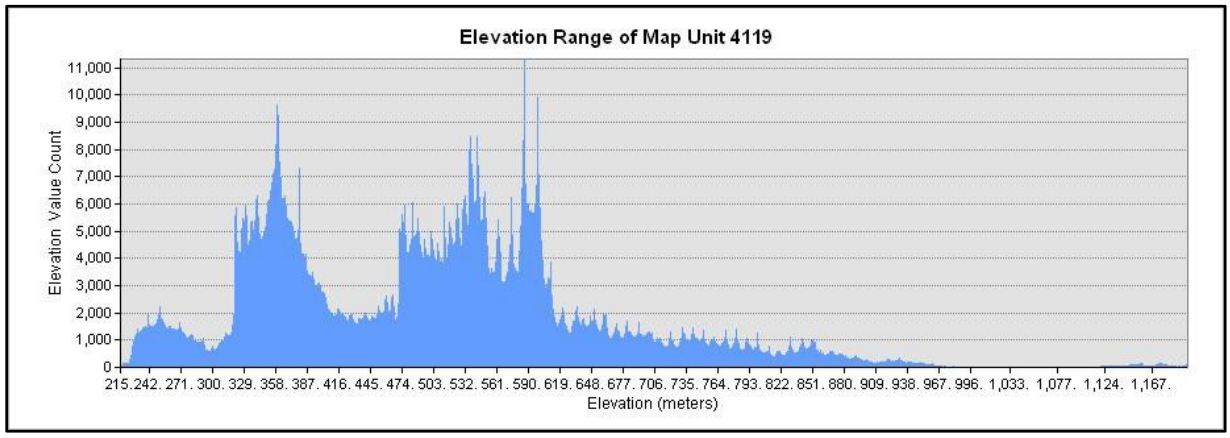
- *Larrea tridentata – Ambrosia dumosa* Alliance (4115) – Stands within this alliance can have a minimal cover of *Ambrosia dumosa*, at times as low as 1 percent. In these settings, *A. dumosa* is often poorly developed, making it is extremely difficult to discern the continuity of the understory shrub layer across the stand. Stands where *Larrea* occurs with a subshrub other than *A. dumosa* dominant, especially at higher elevations, are at times mistaken for this alliance.
- *Larrea tridentata – Encelia farinosa* Alliance (4118) – At times, *Encelia farinosa* can be difficult to discern on steeper slopes where shadowing is extensive. In these settings, photo interpreters use environmental criteria and adjacent stand identification to aid in distinguishing this dual-species alliance.

***Larrea tridentata* Alliance (4119)**



DISTRIBUTION: This alliance is found throughout the Mojave and Colorado Desert portions of the DRECP. In the current study area, in the Searles Valley subarea, this alliance is mapped mostly at the northeast portion of the Panamint Valley, with other stands scattered throughout the remainder of the Panamint Valley. A few stands are mapped in the northern Searles Valley along he Slate Range and in Wilson Canyon, as well as scattered occurrences from Trona south the southern end of the Searles Dry Lake bajada. In the West Mojave Trails A subarea, the alliance is mapped on the darker fans of the Bristol Mountains, with large stands around Ash Hill and east of Ludlow. Additional sites are mapped on large fans northwest of Amboy.

***Larrea tridentata* Alliance (4119)**



Larrea tridentata – Ambrosia dumosa Alliance (4115)

Creosote bush – White bursage scrub Alliance

The aerial view shows the larger, darker, evenly spaced shrubs of *Larrea tridentata* over smaller light gray *Ambrosia dumosa*. Note: This screenshot is a portion of a larger polygon whose northern boundaries are not shown.

The ground photo shows the olive-green, medium-height *Larrea tridentata*, seen here dominating the entire landscape over a higher cover of smaller, silver-gray *Ambrosia dumosa* shrubs. Understory annual grasses (mostly non-native) occur here as an inconsistent cover in this stand.

***Larrea tridentata – Ambrosia dumosa* Alliance (4115)**

DESCRIPTION: In this alliance *Larrea tridentata* is broadly co-dominant with *Ambrosia dumosa,* and both species are evenly distributed across the stand. In combination, the two species (if their covers are added) clearly dominate. However, mapping of this alliance takes into account areas of *Larrea* without *Ambrosia* or *Ambrosia* without *Larrea* if they occur as variable patches within broader *Larrea tridentata – Ambrosia dumosa* stands. *Ambrosia dumosa* is consistently present with at least 1 percent cover occurring between evenly spaced *L. tridentata*; however, it may have higher cover than *L. tridentata*. If *Encelia farinosa* is present, it is sub-dominant. *Yucca schidigera* if present is less than 1 percent cover or is unevenly distributed. However, if *Y. schidigera* is higher cover and evenly distributed, the *Yucca schidigera* Alliance is mapped. *Atriplex polycarpa* can be co-dominant. The *Larrea tridentata – Ambrosia dumosa* Alliance is widespread on all but the hottest and rockiest areas of the middle and lower elevations. It is also unlikely to be found in sandy or alkaline settings. It is not expected on old alluvial surfaces, where *A. dumosa* tends not to grow. Older alluvial fans with interfluves are commonly mapped as the *Larrea tridentata* Alliance rather than *Larrea tridentata – Ambrosia dumosa*. In the lowest and hottest portions of the Mojave Desert mountains, *Larrea tridentata – Ambrosia dumosa* tends to occur on north-facing slopes, while *Larrea tridentata – Encelia farinosa* or *Encelia farinosa* Alliances favor south-facing exposures.

PHOTOINTERPRETATION SIGNATURE: Stand structure is two-tiered, made up of the medium height *Larrea tridentata* over the smaller subshrub *Ambrosia dumosa*. *L. tridentata* has a brown to green signature color with a diffuse crown edge, while *A. dumosa* has a light gray or brown signature color with a small rounded crown. Species cover may be sparse to moderately dense and can vary widely within a stand. This type occupies a broad range of desert settings. The most extensive stands occur on the broad bajadas and alluvial fans of both the Mojave and Colorado Desert portions of the study area. In the Mojave Desert, the upper elevation limits to this alliance are climatically defined (winter cold) while lower limits are often governed by soil alkalinity.

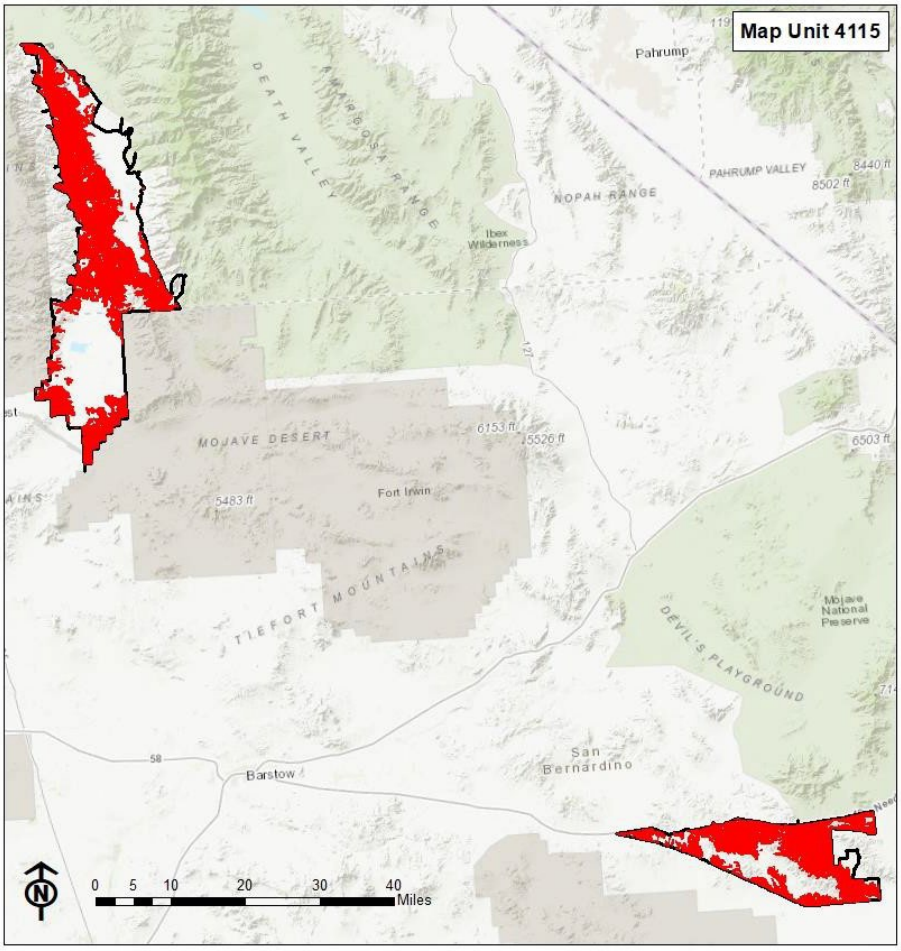
TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

- *Ambrosia dumosa* Alliance (4111) – On bajadas, this alliance is generally associated with disturbed clearings where the *A. dumosa* recovers more quickly than the *L. tridentata*. The two types can become difficult to distinguish when *L. tridentata* is unevenly scattered throughout the stand.
- *Atriplex polycarpa* Alliance (4113) - Along the upper margins of playas, stands containing *L. tridentata, A. dumosa* and *A. polycarpa* are difficult to split between the two types. Generally, when viewing three distinct different shrub sizes, the *Larrea-Ambrosia* dual-species alliance was mapped.

***Larrea tridentata – Ambrosia dumosa* Alliance (4115)**

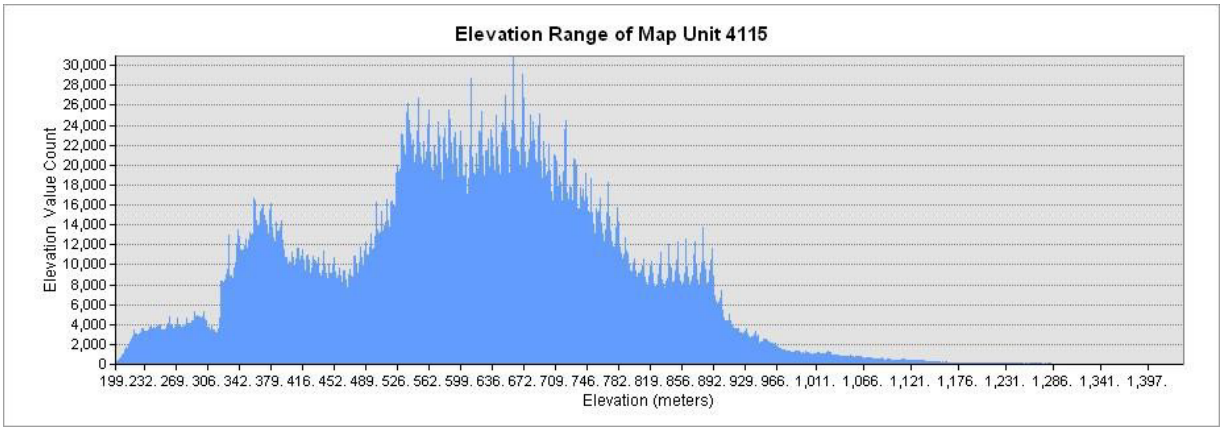
- *Larrea tridentata* Alliance (4119) – This type is difficult to distinguish at higher elevations when understory shrub diversity is high and may not be dominated by *Ambrosia dumosa.* In these settings, photo interpreters generally define the stand as a *Larrea tridentata – Ambrosia dumosa* to the upward limits of the *Larrea* where smaller shrubs are still consistent in the stand. It is also difficult to discern low cover of *A. dumosa* at or near 1 percent in disturbance settings. In these situations, photo interpreters generally look for consistency of *A. dumosa* across the stand. On the alkaline margins of playa systems, *Larrea tridentata – Ambrosia dumosa* transitions to *L. tridentata*, then to the *Atriplex polycarpa* Alliance. In this transition zone *Atriplex polycarpa* gradually replaces *Ambrosia dumosa.* Since the zone is often very narrow and it is difficult to distinguish *Ambrosia dumosa* from young *Atriplex polycarpa*, the *Larrea tridentata – Ambrosia dumosa* Alliance was mapped to where it forms a boundary with the *Atriplex polycarpa* Alliance.
- *Larrea tridentata – Encelia farinosa* Alliance (4118) – This dual-species alliance is more common on mountain slopes, especially on darker volcanic rock and on pavement surfaces close to the mountain slope interface. This type generally occurs farther upslope on hotter, more exposed settings. Understory shrubs *(Encelia farinosa)* are generally larger, have a more defined crown and are more distinct against a normally darker substrate than normally is found under *Ambrosia dumosa.*

***Larrea tridentata – Ambrosia dumosa* Alliance (4115)**



DISTRIBUTION: This is the most common type found across the DRECP and occurs on a wide variety of settings. Stands are absent from much of the Transverse Ranges. In the Colorado Desert, this alliance is primarily found in the alluvial fans and flats but is replaced by the *Larrea tridentata – Encelia farinosa* Alliance on upper fans and adjacent mountain slopes. In the current study area, In the Searles Valley subarea, this alliance is mapped throughout the entire study area, except on playas and their margins. It is uncommon on fans between Panamint playa and the Panamint Range, except south of Manly Fall. It is also uncommon at mouth of Poison Canyon where open into Searles Valley, and at the Trona Pinnacles area. It is very common throughout West Mojave Trails A subarea, except on the upper south slopes of the Bristol Mountains and Lava Hills where *Encelia farinosa* is dominant.

***Larrea tridentata – Ambrosia dumosa* Alliance (4115)**



Larrea tridentata – Encelia farinosa Alliance (4118)

Creosote bush – brittle bush scrub Alliance

In this aerial image, *L. tridentata* co-dominates with *E. farinosa* in variable cover. The taller *Larrea* has a diffuse green crown that yields a small shadow. *E. farinosa* is the smaller, lighter-colored shrub with a more distinct crown.

This ground photo example shows an open north-facing hillslope and stream terrace of *Larrea tridentata* and *Encelia farinosa* co-dominating on a cobbly substrate. Note the dark green *Larrea* of medium height and the silver-gray *Encelia* with its dried tawny inflorescence stalks.

***Larrea tridentata – Encelia farinosa* Alliance (4118)**

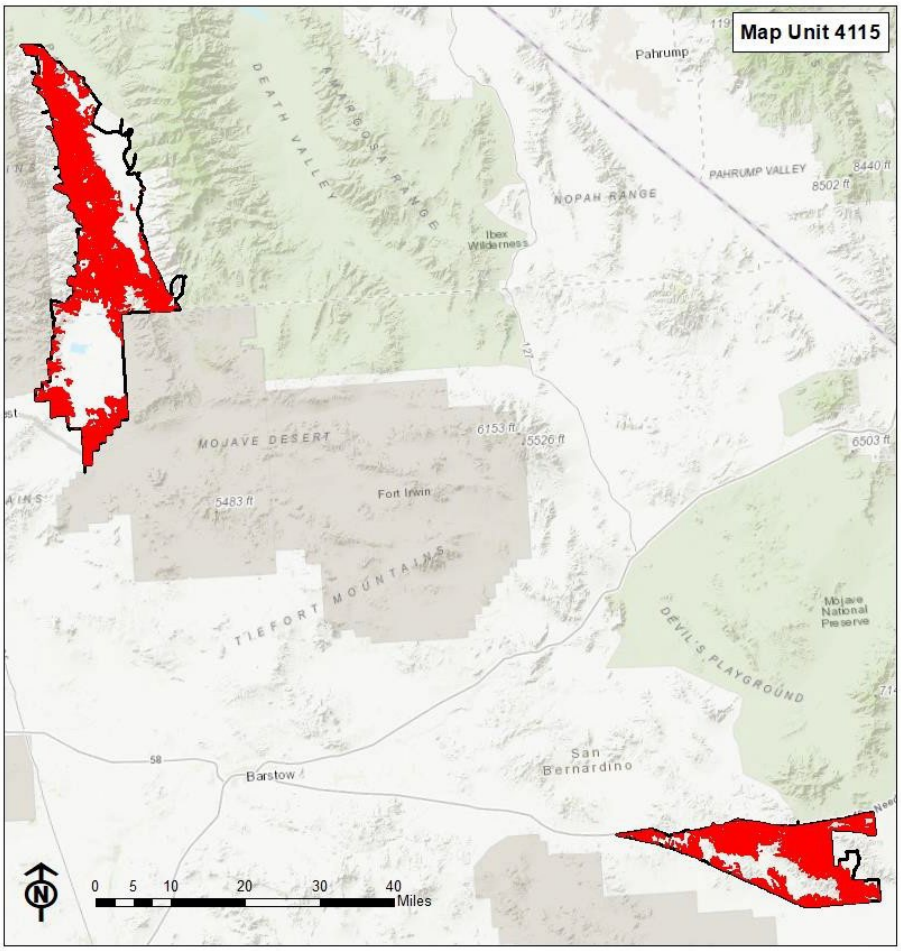
DESCRIPTION: In stands of this alliance *Larrea tridentata* and *Encelia farinosa* are both present and in similar cover (broadly co-dominant). Occasionally, *E. farinosa* is sub-dominant to *Larrea*, but if so, *Ambrosia dumosa* is also in very low cover or absent. *Larrea tridentata, Encelia farinosa*, and sometimes *Ambrosia dumosa*, may co-dominate. In rockier settings with thin soils, vegetative cover usually drops, and a number of small shrubs can co-dominate with *Larrea* and *Encelia,* including *Pleurocoronis pluriseta, Trixis californica*, *Ambrosia dumosa, Viguiera parishii*, and *Simmondsia chinensis.* In rivulets between pavements, any number of species, including *Hyptis emoryi, Acacia greggii,* and *Ambrosia dumosa,* can act as a third co-dominant with *L. tridentata* and *E. farinosa*. Stands are usually found in rocky/bouldery uplands or on well-drained bajadas.

PHOTOINTERPRETATION SIGNATURE: Stands range from sparse to moderately dense in cover, with emergent medium-height *Larrea tridentata* consistently spaced over a subshrub layer of *Encelia farinosa*. *L. tridentata* appears green to brown in color with a diffuse crown edge. *E. farinosa* has a small round crown with a white or light gray color.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

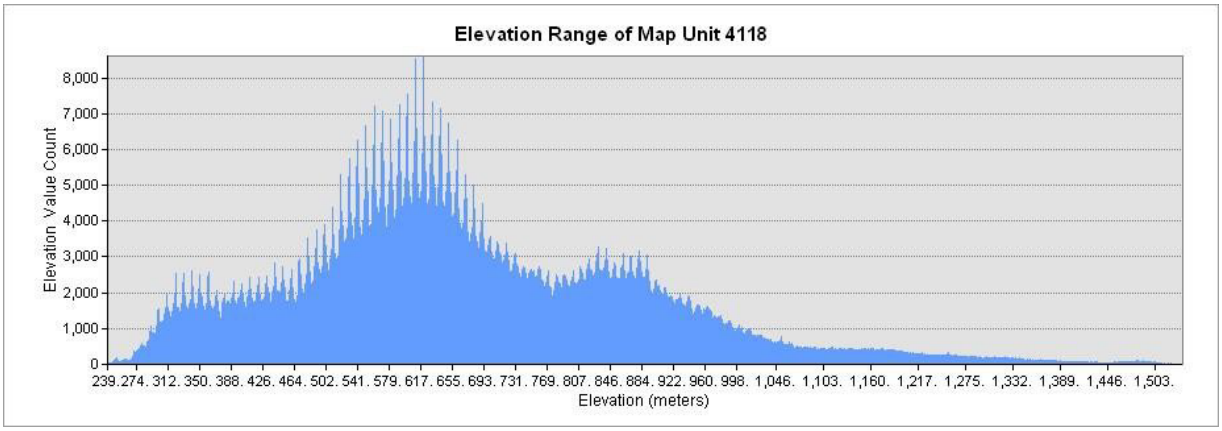
- *Cylindropuntia acanthocarpa/Pleuraphis rigida* Alliance (4161) - Stands where this cactus species dominates contain only small amounts of *Larrea.* Cactus signatures are significantly darker than *Encelia* and crown size varies. Stands are generally found on lower-positioned slopes. Stands tend to be sparse.
- *Encelia farinosa* Alliance (4114) – Stands strongly dominated by *Encelia farinosa* occur on even harsher settings, generally on steeper mid and upper mountain slopes with minimal soil development or in areas where recent fires have killed the former component of *Larrea tridentata*. Presence of *L. tridentata* on south-facing exposures is more readily discernible than on adjacent north-trending slopes where shadowing makes its presence more difficult to detect. Photo interpreters examine adjacent lower slopes and look for rockiness to infer the consistent presence of *Larrea* where it otherwise may be difficult to see.
- *Larrea tridentata – Ambrosia dumosa* Alliance (4115) –In some portions of the Mojave Desert, the two alliances overlap only on desert mountain terrain. In these settings, *Larrea tridentata – Ambrosia dumosa* occurs on adjacent, more mesic-trending northerly slopes and downslope from the hotter, mid and upper south-facing exposures. On these limited exposures, signature characteristics between the two alliances are almost identical. The best method in determining the presence of *E. farinosa* in the Mojave Desert is elevation and regional distribution. With the exception of stands in the Searles and Panamint Valley, nearly all stands are east of Barstow and below 3000 feet (920 meters) in elevation.

***Larrea tridentata – Encelia farinosa* Alliance (4118)**



DISTRIBUTION: This type is highly concentrated in the northern half of the Colorado Desert region and in the Chocolate Mountains bordering the Colorado River. These stands occur on most mid and upper-elevation mountain slopes and adjacent upper fans along all of the Colorado Desert's mountain ranges. Stands are limited in the Central and Eastern Mojave region to areas east of Barstow, with the exception of isolated stands occurring on slopes above Searles and Panamint Valleys, preferring mid and upper south- and west-trending exposures. In the current study area, in the Searles Valley subarea, this alliance is mapped mainly in the Slate Range, and the Argus Range west of the Searles playa, as well as the slopes of the Panamint Range at southeast corner of the subarea. In the West Mojave Trails A subarea, the alliance is very common, and is mapped on all mountains and upper fans.

***Larrea tridentata – Encelia farinosa* Alliance (4118)**



Lepidospartum squamatum Alliance (4212)

Scale broom scrub Alliance

The aerial view shows *Lepidospartum squamatum* shrubs occurring in Teagle Wash, a typical wash setting, upstream from the Trona Pinnacles.

The ground photo shows a dominant stand of *Lepidospartum squamatum* shrub occupying a high-energy wash in Teagle Canyon upstream from the Trona Pinnacles.

***Lepidospartum squamatum* Alliance (4212)**

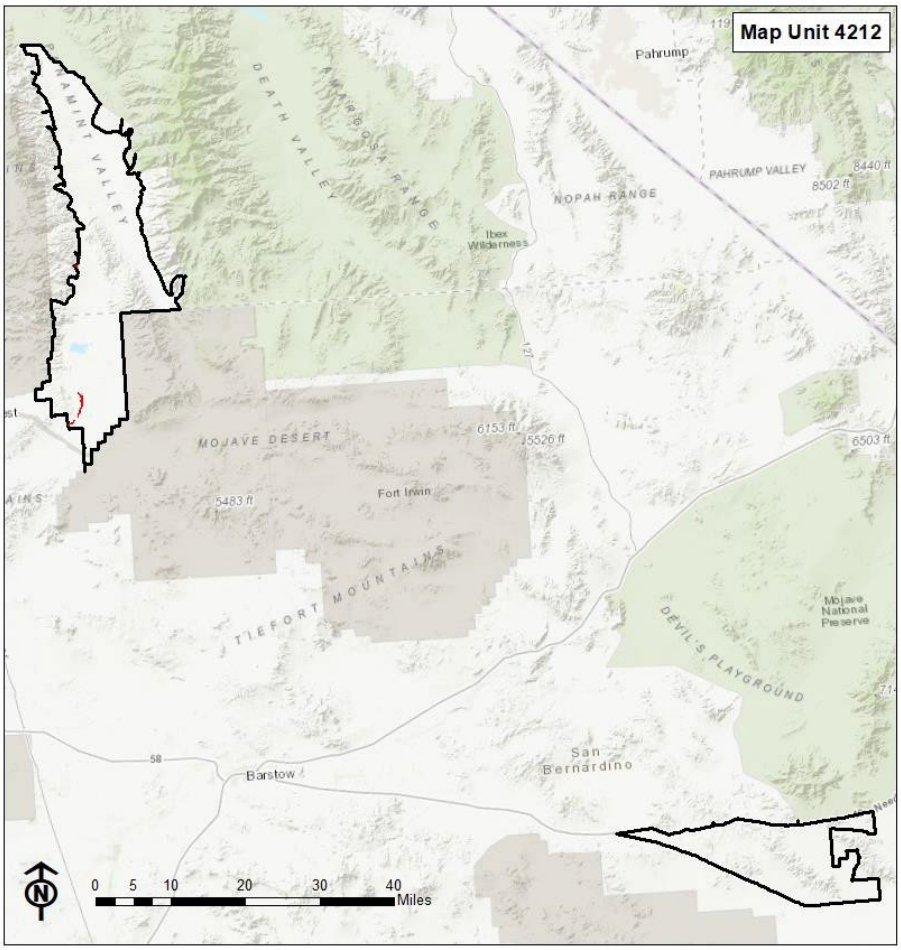
DESCRIPTION: This alliance is mapped where *Lepidospartum squamatum* dominates, co-dominates, or even sub-dominates within the shrub layer due to its status as an indicator species of the alliance. These plants usually occur in larger washes with regular flooding where the substrate texture is coarse sand to small cobbles to gravel. *Lepidospartum squamatum* drops out upstream as watershed area decreases. Downstream, where the channel thins or becomes less dynamic, *L. squamatum* may transition to *Ericameria paniculata*. If *E. paniculata* is mixed with *Lepidospartum squamatum*, it must be more than twice the cover of *L. squamatum* to be assigned to the *Ericameria paniculata* Alliance. Stands for the most part are limited to arroyos and upper fans at the bases of the Transverse Ranges and the Sierra Nevada, as well as in the interior southern Sierra Nevada, and along the Mojave River near Barstow.

PHOTOINTERPRETATION SIGNATURE: Stands range from sparse to moderately dense in cover, with a color variation from brown to brownish green to gray. *L. squamatum* is a small to medium-sized shrub with a rounded to irregular crown shape and rough, uneven texture. It consistently occurs in the most active portions of stream channels.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

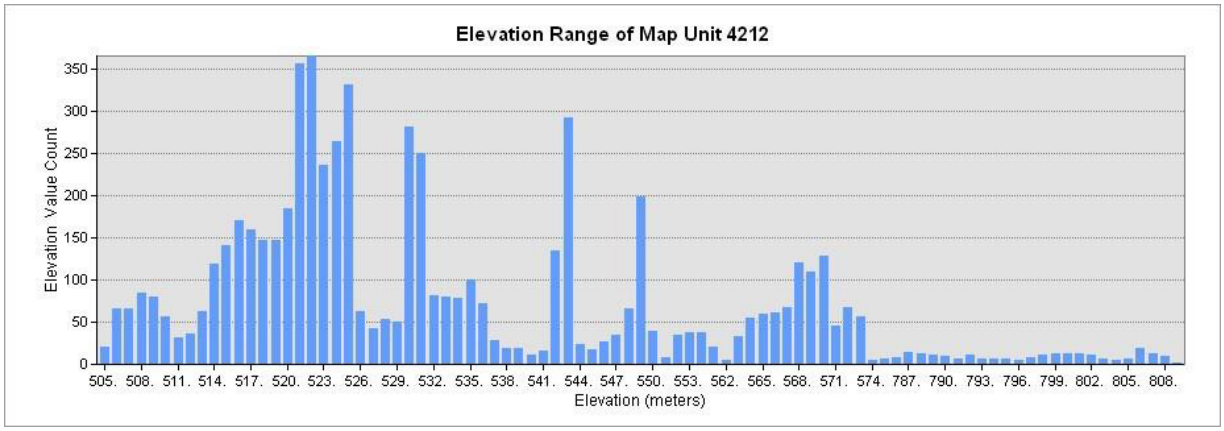
- *Ambrosia salsola – Bebbia juncea* Alliance (7211) – These shrubs are significantly smaller in size, have a lighter gray color, and occupy stream terraces and lower energy washes.
- *Ericameria paniculata* Alliance (4213) – Mature, larger shrubs are distinguished by having a greener color. Otherwise, these plants are difficult to discern from *L. squamatum* due to their similar crown shape, texture, and environmental setting. This species tends to occur in lower-energy washes with smaller watersheds.

***Lepidospartum squamatum* Alliance (4212)**



DISTRIBUTION: Stands are concentrated along washes on the eastern base of the southern Sierra Nevada, San Bernardino and San Gabriel Mountains. The alliance also occurs in wide, very active washes in scattered sites within the Central Mojave Desert as far as the Lava Mountains. In the current study area, in the Searles Valley subarea, *Lepidospartum squamatum* is mapped in Teagle Wash passing through Trona Pinnacles. One site is mapped in a wash at the mouth of Homewood Canyon in the Argus Range. No sites are mapped in the West Mojave Trails A subarea.

***Lepidospartum squamatum* Alliance (4212)**



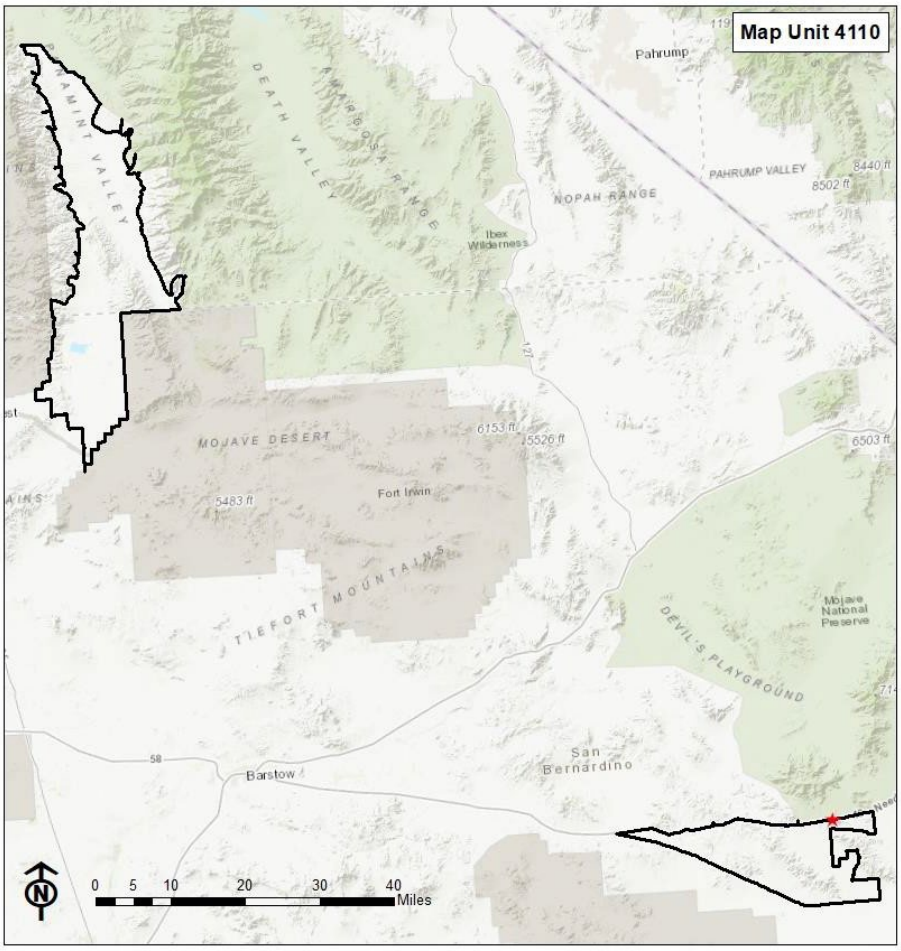
Lower bajada and fan Mojavean-Sonoran desert scrub Group (4110)

The aerial view shows native desert shrubs occurring on Interstate 40 freeway artificial cut.

Ground view of artificial road cut along Interstate 40 freeway with native shrubs growing on it.

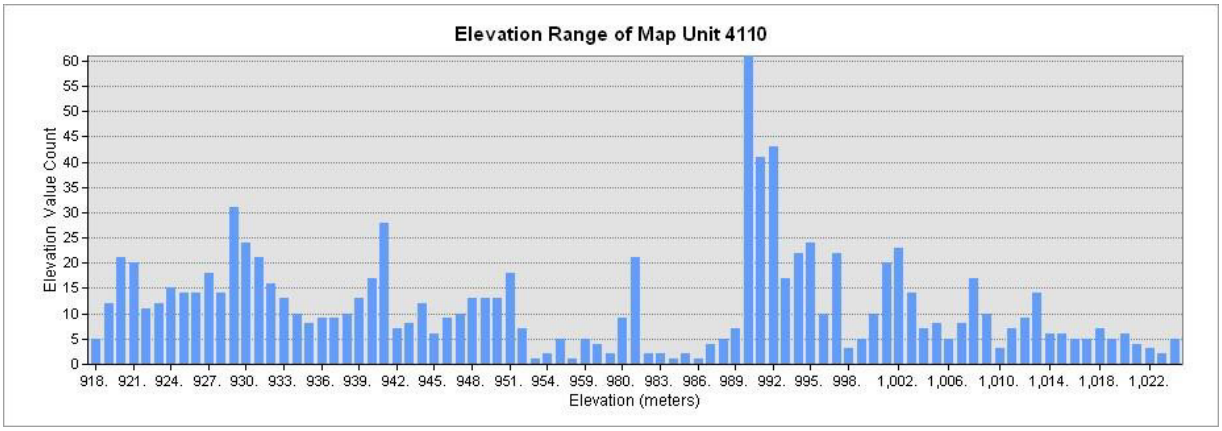
Lower bajada and fan Mojavean-Sonoran desert scrub Group (4110)

DESCRIPTION: Stands dominated or co-dominated by small to moderate-sized native desert shrubs (or perennial grasses). Stands are mapped to the Group level because a definitive signature is not discernible from the imagery at finer levels in the hierarchy. This may be due to the successional or fragmented nature of the stands encompassed within a minimum mappable area. Polygons are mapped to this Group based on field data. In this project it included native shrubs on a road cut along I-40 freeway.



DISTRIBUTION: In the West Mojave Trails A subarea, two polygons, represented as one star, were mapped along a heavily disturbed road cut along Interstate 40 at the northern tip of the Marble Mountains.

Lower bajada and fan Mojavean-Sonoran desert scrub Group (4110)



Salix exigua Alliance (1424)

Narrowleaf willow Alliance

The aerial photo view depicts a stand of *Salix exigua* within a narrow gorge in Pleasant Canyon of the Panamint Range foothills.

This ground photo example shows a stand of wispy *Salix exigua* in a gorge in Pleasant Canyon. Note the long narrow leaves typical of this *Salix* species.

***Salix exigua* Alliance (1424)**

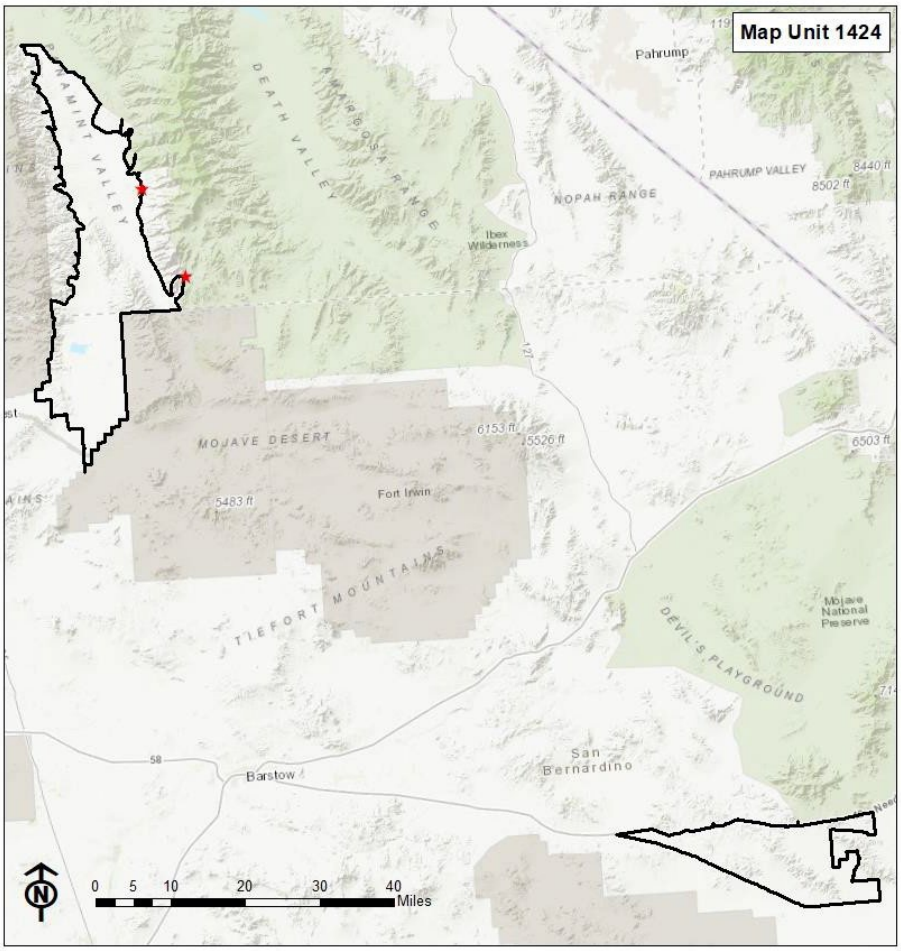
DESCRIPTION: *Salix exigua* is characteristically present as a dominant or co-dominant shrub with more than 5 percent absolute cover and greater than 50% relative cover in the shrub layer. *Baccharis salicifolia* may co-dominate. *S. exigua* forms an open to continuous canopy along riparian corridors. Stands are often found in narrow strips along major creeks and rivers and along ditches and reservoir edges. Other willow species may be present as sub-dominants with low cover. Where *Salix lasiolepis* co-dominates, the stand is mapped to the *Salix lasiolepis* Alliance.

PHOTOINTERPRETATION SIGNATURE: Signature color in the mature growth phase is characteristically blue-green to blue-gray, with variability caused by differences in plant maturity and the dead component to the vegetation. Alternatively, young plants may yield a greener color tone. Stands are typically small in size, with individual crowns coalescing into smooth, continuous thickets. Dense patches are characteristically homogeneous, with other riparian species frequently occurring along the margins of the stand or clonal clumps. Stand cover may range from sparse to very dense but more often than not, cover is high.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

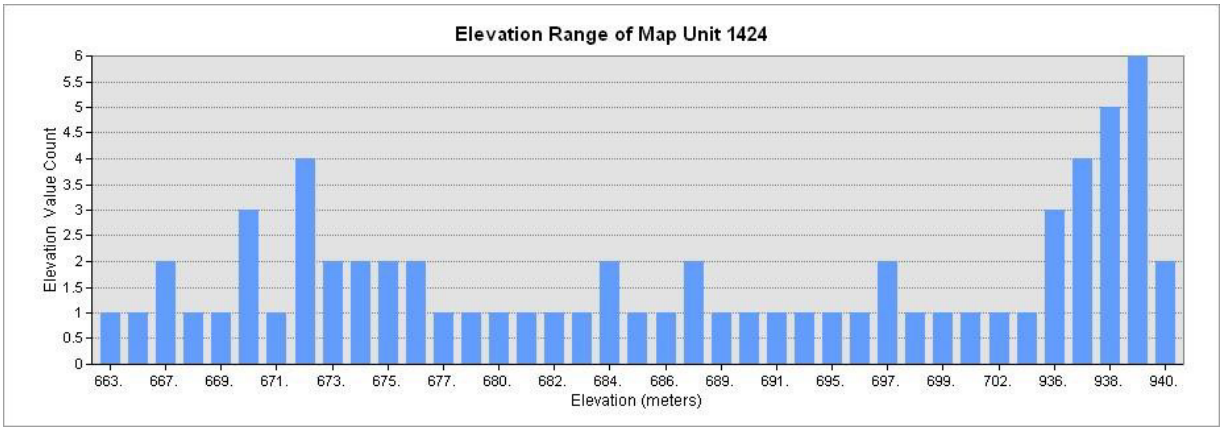
- None

***Salix exigua* Alliance (1424)**



DISTRIBUTION: *Salix exigua* stands previously have been rarely mapped within the DRECP, however primarily occurred in the Western and Central Mojave Desert, especially along the Mojave River and was extensively mapped in the northern Owens Valley. In the current study area, it is mapped at 2 locations in the Searles Valley subarea. One in Pleasant Canyon, the other in Goler Canyon. No sites are mapped within the West Mojave Trails A subarea.

***Salix exigua* Alliance (1424)**



Sarcobatus vermiculatus Alliance (5511)

Greasewood scrub Alliance

The aerial photo view depicts an *Atriplex parryi* stand occurring in a alkaline sandy wash at the mouth of Poison Canyon, just west of Searles Lake.

This ground photo example shows a stand of *Atriplex parryi* that is mixed within a sandy alkaline setting at the north end of Searles Dry Lake.

***Sarcobatus vermiculatus* Alliance (5511)**

DESCRIPTION: *Sarcobatus vermiculatus* and/or *Atriplex parryi* dominate or co-dominate the stand at least 2 percent absolute cover in the shrub canopy. This alliance includes *Atriplex parryi* and *Chrysothamnus albidus* as associations. A few stands of *Atriplex parryi* occur at the edge of Searles Dry Lake, occurring with *Suaeda moquinii*. *Sarcobatus vermiculatus* itself was not encountered in the current project study area.

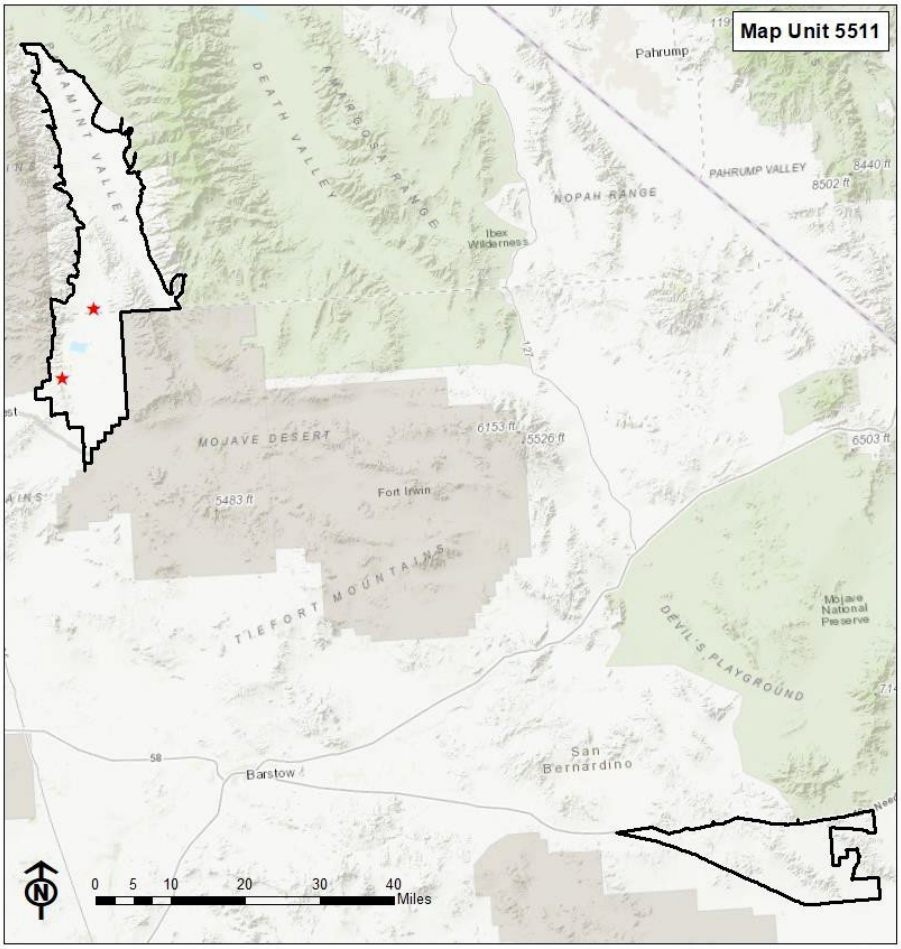
Stands are dominated by the mid-sized shrub *Atriplex parryi.* Stands are mappable at China Lake, Searles Lake, and Owens Lake, where they occur in alkaline basins on fine textured soils just upslope from *Allenrolfea occidentalis* stands or down slope from the *Atriplex confertifolia* stands. Small stands (not mappable) have been noted within larger *A. confertifolia* stands such as at Coyote Lake, and with *A. spinifera* near California City.

PHOTOINTERPRETATION SIGNATURE: The stands of *Atriplex parryi* are very open to sometimes moderately dense in cover, occurring as small light gray rounded shrubs. These shrubs establish in the terrace just slightly higher than the most saturated and saline areas of the playa. Stands often contain patches of *Atriplex confertifolia* and *Allenrolfea occidentalis,* however those in Searles Valley did not. The herbaceous layer is sparse, and saline characteristics of the soil yield a highly reflective signature adjacent to the plants, making the shrubs in many cases not visible on the imagery. Stands are mapped in local areas where there were field observations of the type.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

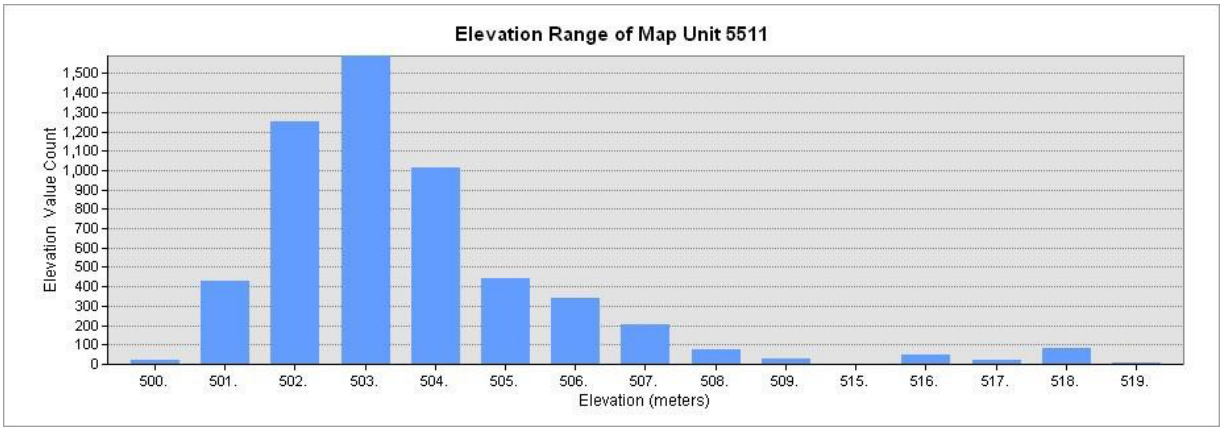
- *Allenrolfea occidentalis* Alliance (3721) – Shrubs can sometimes mix with *Atriplex parryi* (although in Searles Valley they did not) but shrubs are darker and slightly larger, causing this signature to appear darker overall. Non-mappable stands of *Allenrolfea occidentalis* can occur in below-MMU swales within larger *Atriplex parryi* stands.
- *Atriplex confertifolia* Alliance (5112) – The size of these shrubs is very similar to that of *Atriplex parryi* but *Atriplex confertifolia* appears darker in color, prefers slightly less saturated margins of lakes, occurs with a higher diversity and cover of shrubs, and is more common. *A. confertifolia* can occur as non-mappable stands on hummocks within larger *A. parryi* stands or as a subdominant component. Generally, *Atriplex confertifolia* occurs upslope from *A. parryi*. In addition, stands of *A. confertifolia* are more diverse.
- *Atriplex polycarpa* Alliance (4113) – *A. polycarpa* tends to be a larger shrub than *A. parryi*, and in general can occur on less alkaline and more variable settings, including washes, terraces, and upland somewhat alkaline rocky sites.
- *Suaeda moquinii* – *Isocoma acradenia* Alliance (7411) – *Suaeda* individuals appearing as small gray to dark brown shrubs with an irregularly shaped, poorly defined crown edge.

***Sarcobatus vermiculatus* Alliance (5511)**



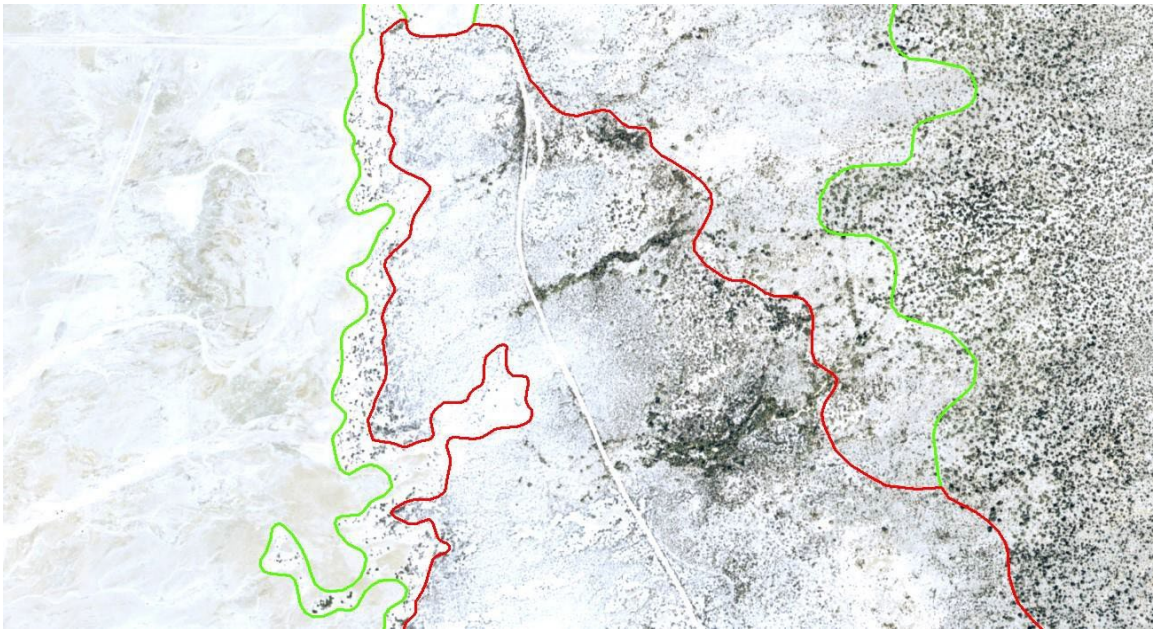
DISTRIBUTION: Previously mapped *Atriplex parryi* stands occur at China Dry Lake, and below-MMU stands have been noted at Coyote Dry Lake and near California City. In the current study area, in the Searles Valley subarea, *Atriplex parryi* is only mapped as 2 polygons (represented by one star) in the Poison Canyon wash mixing with *Suaeda moquinii*, and 3 polygons (represented by one star) are mapped north of Searles playa, near the Trona Airport, adjacent to playa mixing with *Suaeda.* Upslope is *Atriplex polycarpa* and *Atriplex confertifolia*. No sites are mapped in the West Mojave Trails A subarea.

***Sarcobatus vermiculatus* Alliance (5511)**



Suaeda moquinii – Isocoma acradenia Alliance (7411)

Bush seepweed – Alkali goldenbush scrub Alliance



In this aerial view example of the north half of a mapped stand, *Suaeda moquinii* dominates the stand with variable cover and appears as a dark signature. This stand is located on the northeast side of Searles Lake.

In this ground photo example, *Suaeda moquinii* dominates the landscape on Searles Lake as a dark brown wispy short shrub.

***Suaeda moquinii – Isocoma acradenia* Alliance (7411)**

DESCRIPTION: This alliance is mapped where *Suaeda moquinii* or *Isocoma acradenia* dominate the shrub layer. *Suaeda* may have 2 percent or more absolute shrub cover (however, it may have lower cover in shrub stands with a sparse canopy) and evenly distributed with no other native shrubs having greater cover. *Suaeda* stands typically occupy strongly saline or alkaline playas, usually with distinct salt deposits on the soil surface, but they may occur in upland areas adjacent to playas. *S. moquinii* can opportunistically establish in recently disturbed areas and roadsides. *Suaeda* stands often occur in fine-scale drainage patterns formed by cracks in the playa surface. In such situations, they are mapped as low cover (1 to 5 percent shrub) over broad areas. Where wind-blown salts are deposited, *Suaeda moquinii* and *Kochia* may co-occur, and in these cases are mapped as the *Suaeda moquinii – Isocoma acradenia* Alliance (there is no *Kochia* Alliance defined yet). If *Suaeda moquinii* and either *Atriplex canescens*, *A. polycarpa*, *A. confertifolia* or *A. torreyi* co-dominate, the alliance is *S. moquinii – Isocoma acradenia*. If *S. moquinii* and *Allenrolfea occidentalis* co-dominate, the alliance is the latter. *Isocoma acradenia* was not encountered in the current project study area.

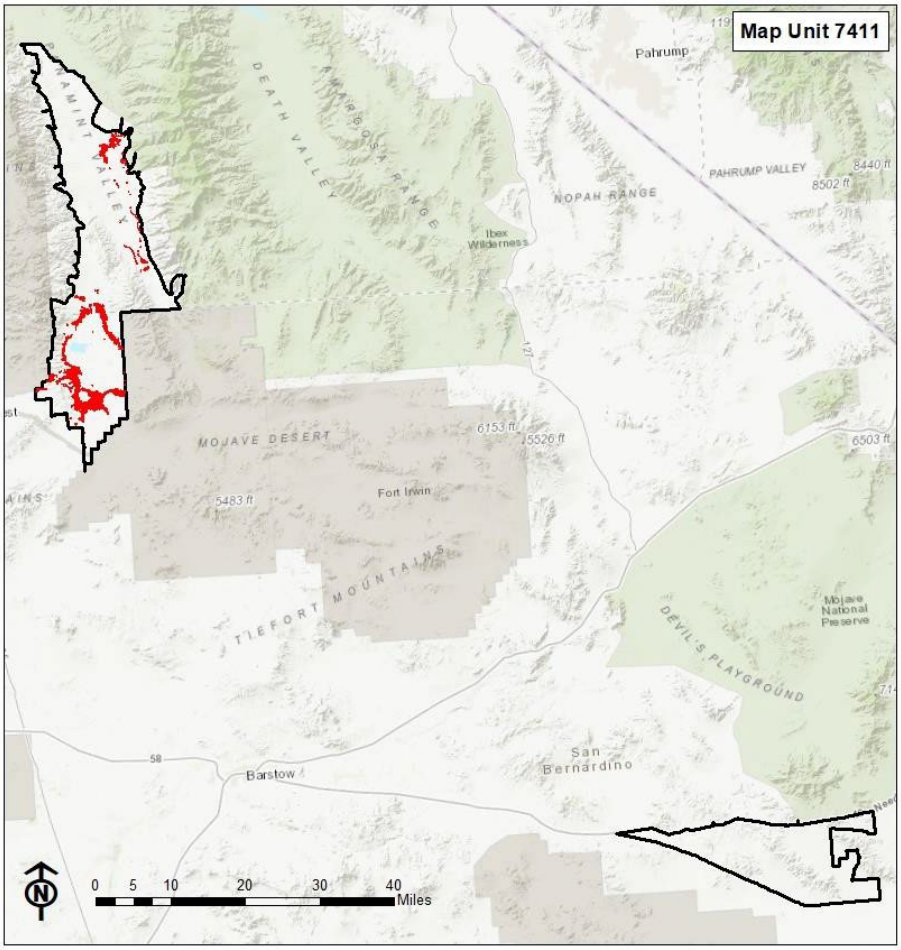
Note: As part of this project effort, additional classification data collection and analysis were performed for the Searles Valley, West Mojave Trails A, Jawbone South and Owens Valley subareas. Floristic classification changes affecting the floristic hierarchy resulted from the classification analysis. Subsequently, *Suaeda moquinii* Alliance (3725) and the *Isocoma acradenia* Alliance (3728) were reassigned as a mapping unit and association of the new *Suaeda moquinii – Isocoma acradenia* Alliance (7411).

PHOTOINTERPRETATION SIGNATURE: Stands of *Suaeda* range from sparse to dense in cover with individuals appearing as small gray to dark brown shrubs with an irregularly shaped, poorly defined crown edge. When occurring in playas, along playa margins or in upland scalds, shrub composition can be very heterogeneous with a wide variability of cover within a single stand. When these shrubs co-occur with other species at low cover, the species are very difficult to discern from one another.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

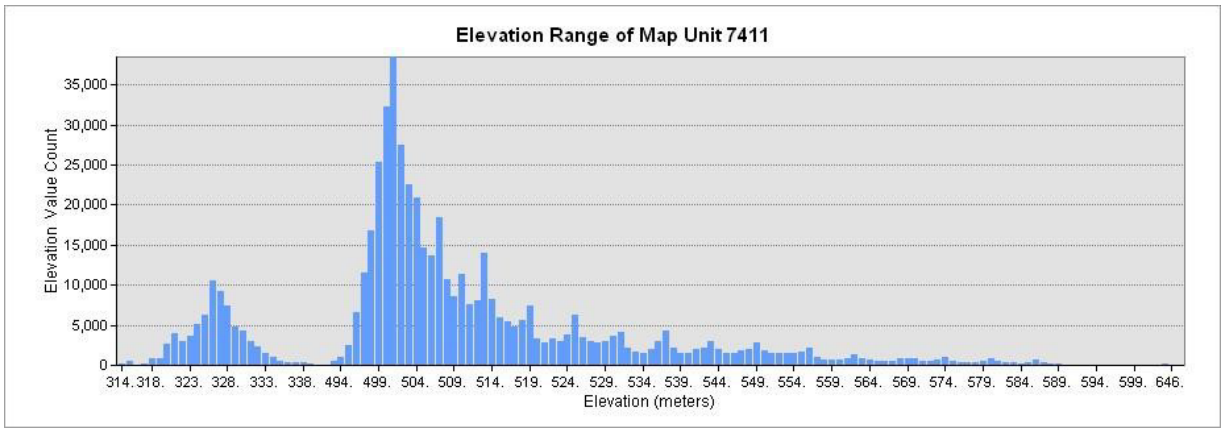
- *Allenrolfea occidentalis* Alliance (3721) – Stands are usually limited to the most saline and saturated portions of a playa compared to *Suaeda*.
- *Atriplex confertifolia* Alliance (5112) – Shrubs may have a lighter gray color and may occur in settings richer in species diversity yielding a more variable signature across the stand.
- *Atriplex polycarpa* Alliance (4113) – Shrubs establish in drainages and along edges of larger washes. They tolerate disturbance better. *A. polycarpa* occurs in clumpier, more continuous growth patterns and appear as a bluish gray color.
- *Sarcobatus vermiculatus* Alliance (3722) – *Atriplex parryi* occurs in similar conditions as *Suaeda moquinii* but is denser and has a grayer appearance.

***Suaeda moquinii* – *Isocoma acradenia* Alliance (7411)**



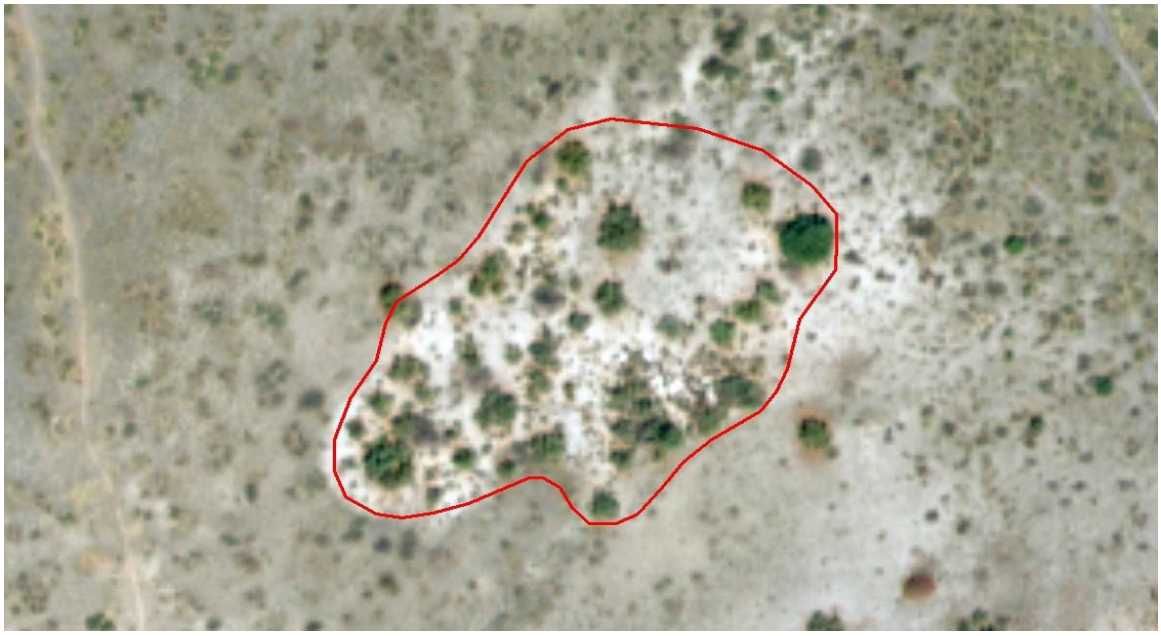
DISTRIBUTION: *Suaeda moquinii* occurs in an extremely broad array of edaphic and topographical settings throughout the desert. Stands are associated with nearly all the major dry lakes in all regions of the DRECP. Stands also occur in areas of fluvial and anthropogenic disturbance, including the Mojave River and on old agricultural fields in the Salton Sea Trough zone. In the current study area, in the Searles Valley subarea, *Suaeda* is mapped ringing the Searles Lake playa (much more extensively on the southwest side), and the Panamint playa (mostly narrow bands on west, east, and south, and broader stands on north end of playa). No sites were mapped in the West Mojave Trails A subarea.

***Suaeda moquinii – Isocoma acradenia* Alliance (7411)**



Tamarix spp. Semi-natural Stands (1432)

Tamarisk thickets Semi-natural Stands



This aerial view shows a small stand of *Tamarix* occurring in a moist part of the edge of Panamint playa just north of Warm Sulphur Spring.

In this ground view, tall *Tamarix* spp. is seen (mid-view) in the fall colonizing in clonal groups along the Panamint Valley playa.

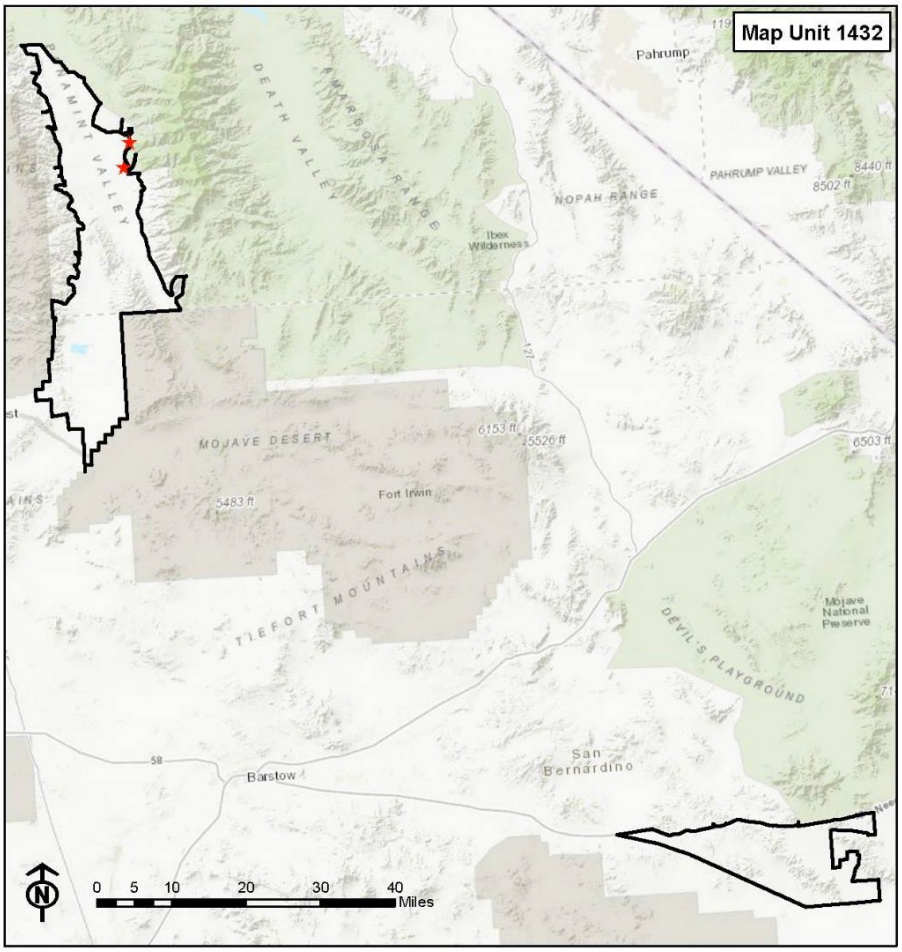
***Tamarix* spp. Semi-natural Stands (1432)**

DESCRIPTION: In these semi-natural stands the vegetation is strongly dominated by tall shrubby invasive *Tamarix* spp., such as *T. ramosissima, T. chinensis*, or other similar species. *Tamarix* spp. constitutes more than 60 percent of the relative cover. These stands do not include the taller and less invasive *T. aphylla,* which is mapped to the more generalized exotic tree category (9500) in the mapping classification. In stands where *Prosopis glandulosa* is consistent in the tall shrub layer with *Tamarix,* the stand is mapped to *Prosopis* even when *Tamarix* dominates the stand.
PHOTOINTERPRETATION SIGNATURE: Stands occur in very open to very dense cover and are typically found along man-made canals, in riparian washes and in disturbance areas. Structural characteristics vary considerably, from stands containing sparse short shrubs along sandy river flats to dense tall thickets adjacent to the active channel. Individual shrubs have dense, irregularly shaped crowns, and vary considerably in size. Color tone varies from green to gray to brown, depending on the age, health, and leaf phase of a particular stand.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

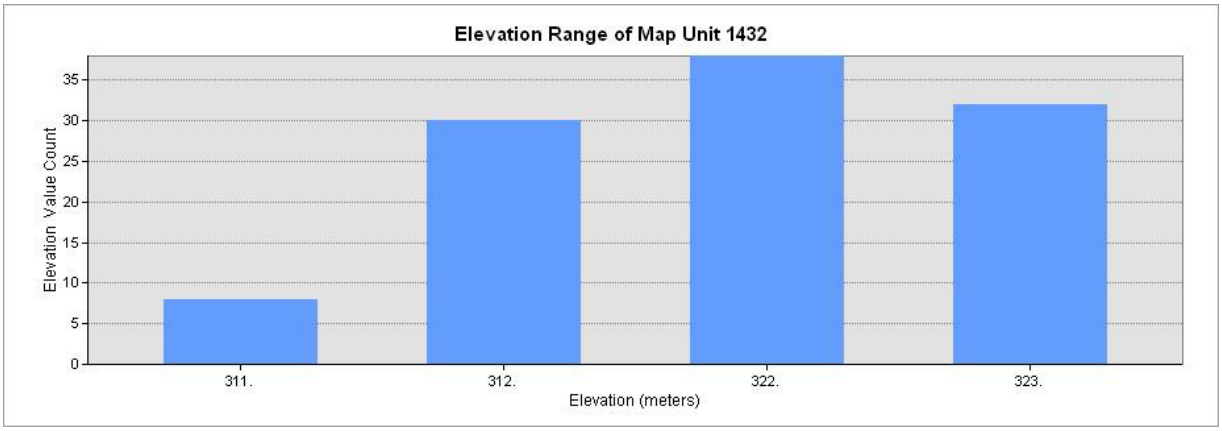
- *Prosopis glandulosa – Prosopis velutina – Prosopis pubescens* Alliance (4222) – In the current project study area, stands occur primarily in wetland areas adjacent to Panamint playa, where *Tamarix* may be a component or form small stands of their own. The more consistently rounded crowns of *Prosopis* can be easily identified even in stands where *Tamarix* dominates. Signature color ranges from bright green to gray depending on time of year and percent of the crown that is alive. In addition to these factors, the signature color for *Tamarix* is more dependent upon the age of the stand.

***Tamarix* spp. Semi-natural Stands (1432)**



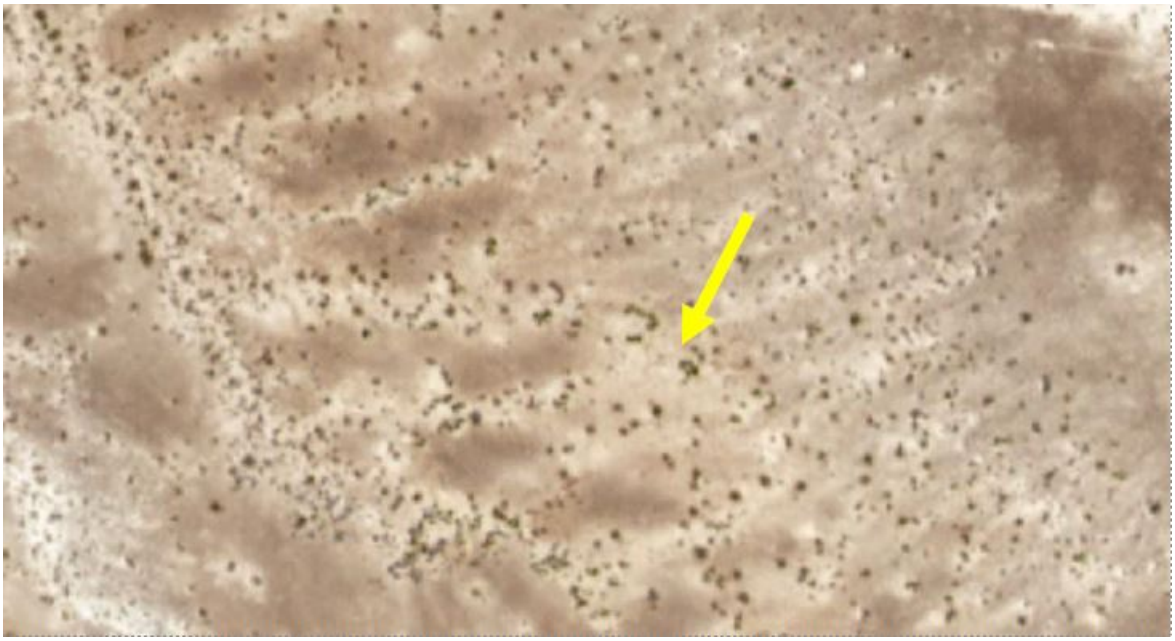
DISTRIBUTION: *Tamarix* is prevalent throughout the DRECP along rivers and creeks, and adjacent to dry lake beds near agriculture. In both situations, stands of *Tamarix* spp. are closely related to human disturbance and occur within close proximity to groundwater. Some of the largest, most extensive stands occur along the Mojave and Colorado River and are especially common in the Salton Trough along major canals and larger washes. Large stands also form continuous bands along the margins of the Salton Sea. In the current study area, in the Searles Valley subarea, Tamarix is mapped in 2 polygons on the east side Panamint playa in the vicinity of *Prosopis* and *Allenrolfea* stands. No sites are mapped in the West Mojave Trails A subarea.

***Tamarix* spp. Semi-natural Stands (1432)**



Yucca schidigera Alliance (5424)

Mojave yucca Alliance



The aerial image depicts *Yucca schidigera* scattered throughout the stand. The most visible feature of this species of *Yucca* is the fairly conspicuous shadow on the larger individuals.

The ground photo shows Yucca schidigera scattered throughout the stand, mixed with *Larrea tridentata* and other short shrubs. The arrow points to a taller example.

***Yucca schidigera* Alliance (5424)**

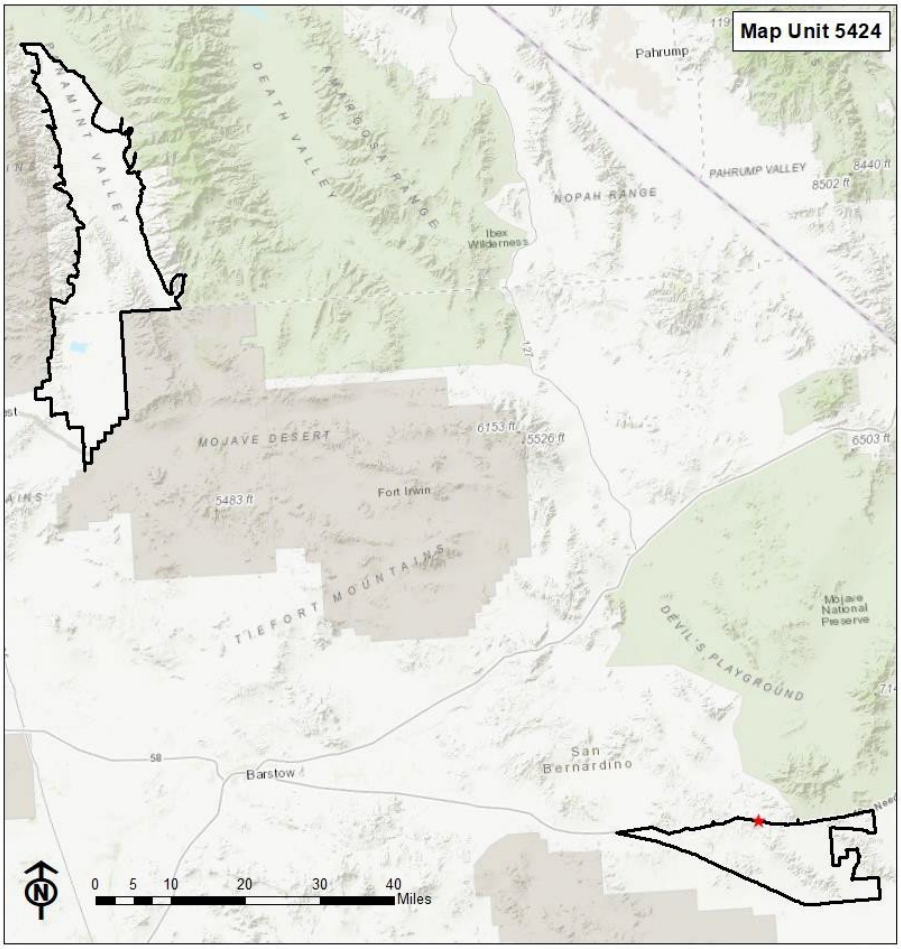
DESCRIPTION: In stands of this alliance *Yucca schidigera* is conspicuous, evenly distributed, and generally comprises at least 1 percent absolute cover. At lower elevations, stands may have *Larrea tridentata, Ambrosia dumosa*, and other shrubs at equal or even higher cover. At upper elevations *Yucca brevifolia* is often scattered in the tree layer with less than 1 percent cover, and *Juniperus californica* may be present with less than 2 percent cover. If *Juniperus* is at least twice the cover of *Y. schidigera*, then the stand is mapped as the *Juniperus californica* Alliance. Where *Coleogyne ramosissima* and *Y. schidigera* occur together*, Coleogyne* has to be at least two times the cover of *Y. schidigera* to be mapped as the *Coleogyne ramosissima* Alliance. Near the upper-elevation range of the *Yucca schidigera* Alliance, stands are found on pediments and upper fans. At lower and middle elevations, stands are common on bajadas and moderate to gentle hillslopes.

PHOTOINTERPRETATION SIGNATURE: Because other shrubs can be of equal or greater cover, the photo signature of a stand mapped as the *Yucca schidigera* Alliance will have the characteristics of the more conspicuous plants (i.e., *Larrea tridentata* at lower elevations and *Coleogyne ramosissima* at higher elevations). *Y. schidigera* almost always occurs in areas where *L. tridentata* is present with a higher cover in the shrub layer. Characteristic to the signature of *Y. schidigera* is the noticeable short shadow created by multi-stemmed individuals that crown within a meter of the ground. Where *Y. schidigera* occurs on pediment substrate, the individual plants can be easily distinguished against the light-colored surface.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

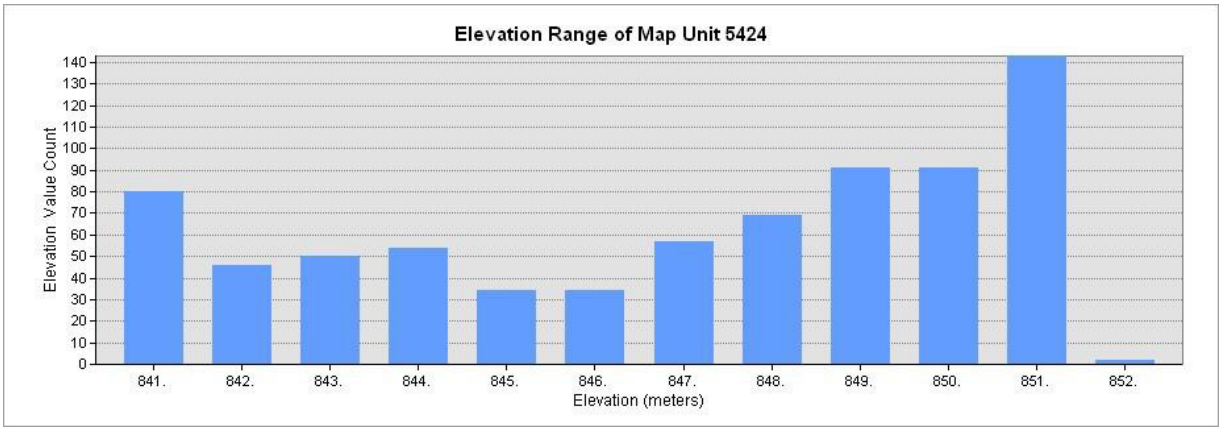
- *Larrea tridentata – Ambrosia dumosa* Alliance (4115) – The stand of medium height *Larrea tridentata* over the smaller subshrub *Ambrosia dumosa* lacks the evenly distributed occurrence of *Yucca schidigera,* which on the imagery will have distinct short linear shadows. *L. tridentata* has a brown to green signature color with a diffuse crown edge, while *A. dumosa* has a light gray or brown signature color with a small rounded crown.

***Yucca schidigera* Alliance (5424)**



DISTRIBUTION: Almost all mapped stands of this alliance occur east of the Mojave River and south of Interstate 40, with the highest concentration of polygons and largest stands occurring on lower slopes of the Ord Mountains and on the alluvial fans surrounding them. Smaller stands occur in higher elevations toward the eastern end of Lucerne Valley and on fans near the towns of Yucca Valley and Joshua Tree. In the current project area, in the West Mojave Trails A subarea, *Yucca schidigera* Alliance was mapped as only one polygon adjacent to the Interstate 40 freeway on old dissected upper fans between the Bristol Mountains and the Old Dad Mountains. No sites were mapped in the Searles Valley subarea.

***Yucca schidigera* Alliance (5424)**



Herbaceous

- Arid West freshwater emergent marsh Group (3410) SV
- California annual and perennial grassland Mapping Unit (Native component) (2305) SV
- *Distichlis spicata* Alliance (3726) SV
- Mediterranean California naturalized annual and perennial grassland Group (2330) SV

Arid West freshwater emergent marsh Group (3410)

This aerial view example of the Arid West freshwater emergent marsh Group located at Warm Sulphur Springs on the east side of the Panamint Valley playa. Note the mottled signature.

In this ground photo, the Arid West freshwater emergent marsh Group is represented by *Typha* spp. in the mid view of the scene. This wetland is located at Warm Sulphur Springs in the Panamint Valley.

Arid West freshwater emergent marsh Group (3410)

Description: The Arid West freshwater emergent marsh Group includes wetland species such as *Typha* spp., *Schoenoplectus* spp (tall bulrushes), and/or *Phragmites australis* ssp. a*mericanus,* that dominate the stand.

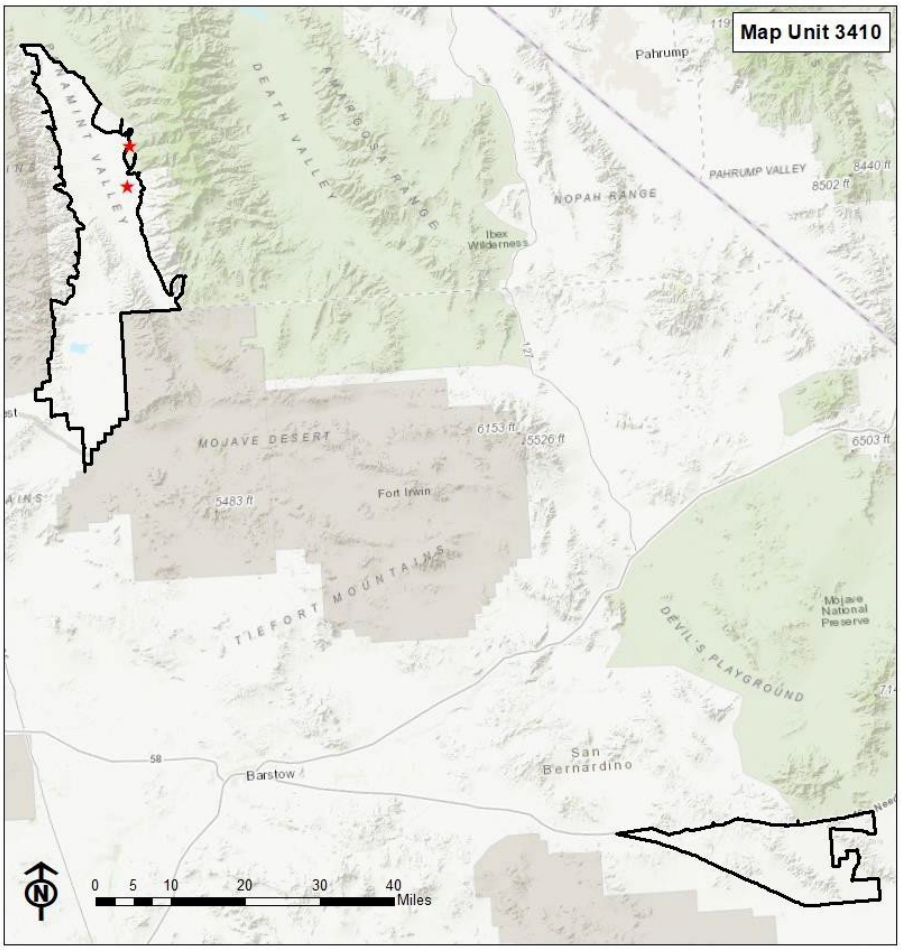
Most *Typha* spp. stands growing within water with slightly alkaline or saline chemistry are *T. domingensis*. Stands of *T. latifolia* have only been inventoried in fresh water at Lost Lake (Cajon Pass region).

Schoenoplectus spp., which includes *S. acutus* and *S. californicus,* stands occur in all areas of the DRECP where ponds and sluggish permanently flowing water exist. *S. acutus* occurs in fresh or brackish water; *S. californicus* appears more regularly at edges of open water. *Bolboschoenus maritimus* (formerly *Scirpus maritimus)*, the alkali bulrush, occurs in brackish to salty or alkaline water near or on playas such as Coyote Lake and the Owens Valley.

Phragmites australis ssp. *americanus* stands are small and occur adjacent to permanent water sources such as springs, flowing streams and rivers. Most are below mappable size, with the exception of some stands along the Colorado River and near the Salton Sea. Hybrids between the native species of the American Southwest and non-native Eurasian species are occurring in some areas and make conservation prioritization difficult. Most stands in isolated wetlands and along ditches appear native.

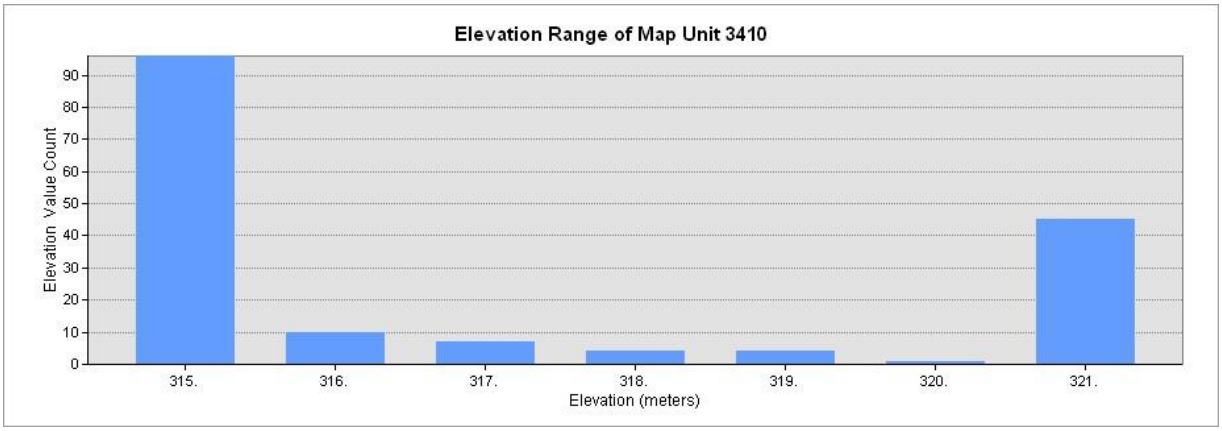
These stands were mapped at the Group level because the alliance was not discernible from the imagery. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

Arid West freshwater emergent marsh Group (3410)



DISTRIBUTION: The Arid West freshwater emergent marsh Group occurs throughout the DRECP study area, primarily along the Colorado River, the Owens River, the eastern and western sides of the Imperial Valley, and scattered within the Western and Central Mojave areas. In the current study area this Group is mapped as 2 polygons on the east side of Panamint playa of the Searles Valley subarea, primarily as *Typha*. No sites were mapped in the West Mojave Trails A subarea.

Arid West freshwater emergent marsh Group (3410)



California annual and perennial grassland Mapping Unit (Native component) (2305)

This aerial view example of low to moderate cover of the California annual and perennial grassland Mapping Unit is located at the southern end of the Argus Range southwest of Searles Lake. It contains many dead and dying shrubs.

In this ground photo the Group is represented by the variable low to moderate cover of grassland containing a scattering of dead shrubs including *Atriplex confertifolia*.

California annual and perennial grassland Mapping Unit (Native component) (2305)

DESCRIPTION: This mapping unit can be composed of native and/or non-native grasses and forbs of variable composition which cannot be discerned on the aerial imagery. Stands composed of grasslands are presumed to contain a component of native grass and herb species, however, with wildflower color signatures the stand can be mapped as the California annual forb/grass vegetation Group. Stands within this mapping unit can occur in both natural and highly disturbed settings, such as vacant lots in urban locations and on old agricultural fields. In the western Mojave Desert, these grasslands tend to maintain a native component even though cover may be dominated by non-native species such as *Bromus rubens*, *Bromus berteroanus*, *Erodium* spp., or *Schismus* spp. Stands occur throughout the western Mojave, but are more apt to shift from higher grass cover with several native species (*Achnatherum speciosum, Nassella cernua, Poa secunda)*, to less grass cover and more forb cover to the east. Some stands may be co-dominated with *Amsinckia* spp., *Coreopsis calliopsidea*, and non-native grasses. Patches of California annual forb/grass Group (2310) may occur interspersed with this mapping unit.

These stands were mapped from ground data as a “Mapping Unit” because the alliance was not discernible from the imagery. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

PHOTOINTERPRETATION SIGNATURE: Stands generally have a monotypic signature with little variability. Texture is generally very smooth except in disturbance settings where there is a history of vegetative clearing, or in alkaline areas that have scattered small scalds within the stand.

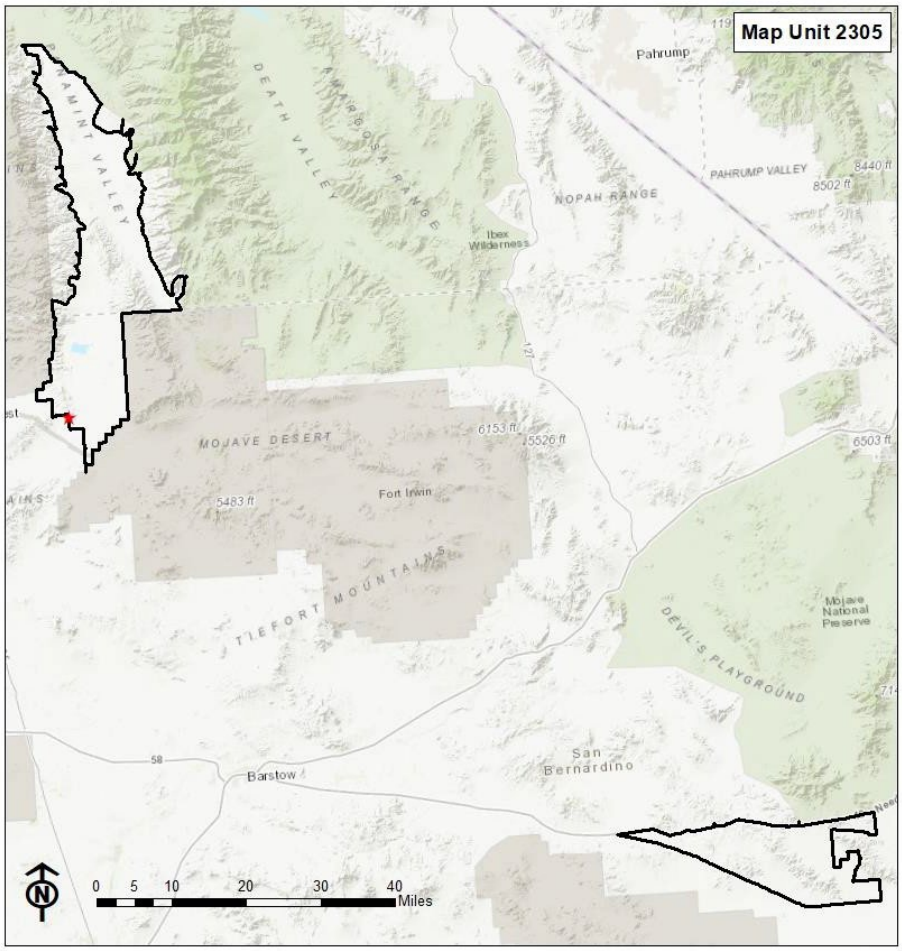
TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

- California annual forb/grass vegetation Group (Flower Fields) (2310) – Stands containing a component of showy flowers (*Eschscholzia californica, Lasthenia californica, Monolopia* spp*., Amsinckia* spp.) will exhibit color on at least one set of imagery. When the color is consistent over an area larger than 10 acres, the stand should be mapped to this type. These colorful signatures stand out on imagery flown after an especially high late-season rainfall year.
- Mediterranean California naturalized annual and perennial grasslands Group (Weedy) (2330) – This type cannot reliably be separated out based on photo signature alone. Texture overall is generally more mottled, but signature overlap between the two types is considerable because both mapping units can have a significant matrix of grass and forb species within a stand. In general, most stands that are highly disturbed will contain less of a native component. If the disturbance is occurring in a large urban or agricultural region, the stand is less likely to have a native component. Small disturbances such as recent clearings away from urban or agricultural lands can however return with a high component of native species such as *Achnatherum speciosum* or *Nassella.*

California annual and perennial grassland Mapping Unit (Native component) (2305)

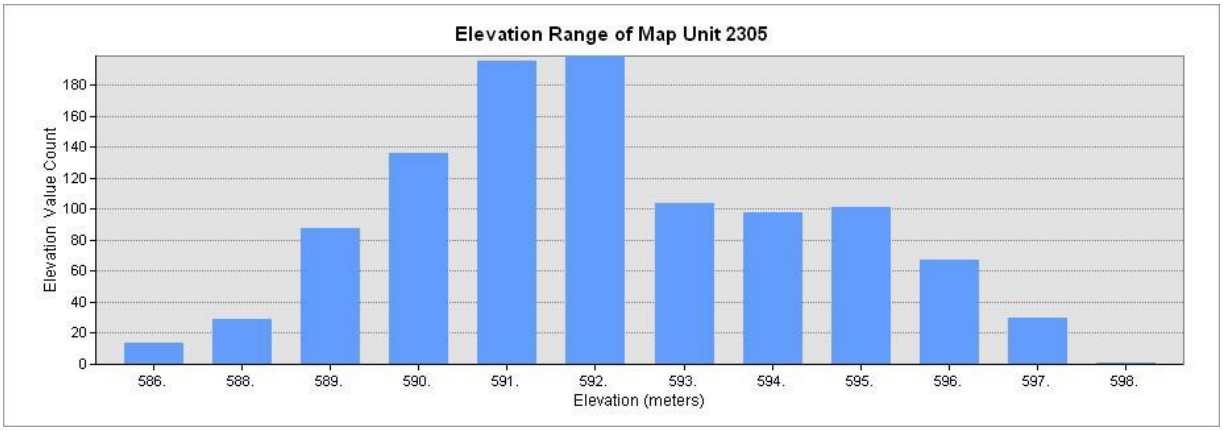
- Sparse early seral stands of shrub cover – Many examples of early post disturbance cleared fields contain a sparse and inconsistent cover of shrubs such as *Eriogonum fasciculatum, Ericameria nauseosa, Ericameria cooperi,* and *Eriodictyon,* to mention a few. This cover may vary considerably between image datasets created in different years and also between the baseline imagery date and when subsequent field verification was undertaken.

California annual and perennial grassland Mapping Unit (Native component) (2305)



DISTRIBUTION: This mapping unit is widely distributed throughout Western and Central Mojave area, west of the Mojave River, and very prevalent in the Antelope Valley and Jawbone Canyon. In the current study area, this type is mapped as 2 polygons (represented by one star) southwest of the Trona Pinnacles in the Searles Valley subarea. No sites were mapped in the West Mojave Trails A subarea.

California annual and perennial grassland Mapping Unit (Native component) (2305)



Distichlis spicata Alliance (3726)

Salt grass flats Alliance

This aerial view shows a stand of *Distichlis spicata* mapped along the eastern margin of Panamint Valley playa at Post Office Springs.

This ground photo depicts a stand of dense green-yellow *Distichlis spicata* in the foreground along the margins of Panamint Valley in at Post Office Spring.

***Distichlis spicata* Alliance (3726)**

DESCRIPTION: *Distichlis spicata* is dominant to co-dominant with at least 2% cover in the herb layer; though, non-native herbs may be present with moderately higher cover. Densely tufted *Juncus cooperi* may co-dominate. *Scirpus nevadensis* may dominate or is characteristically present with *Distichlis*. Soils are often deep, alkaline or saline, and poorly drained. A variety of native and non-native forbs and grasses may be present. *Distichlis spicata* is restricted to moderate to strongly alkaline and saline soils. Stands are associated with alkali springs, playa and panne margins. *D. spicata* is a short rhizomatous salt grass likely to be seen adjacent to episodically flooded basins, springs, playas, and salt marshes, sometimes without visible salt deposits on the surface.

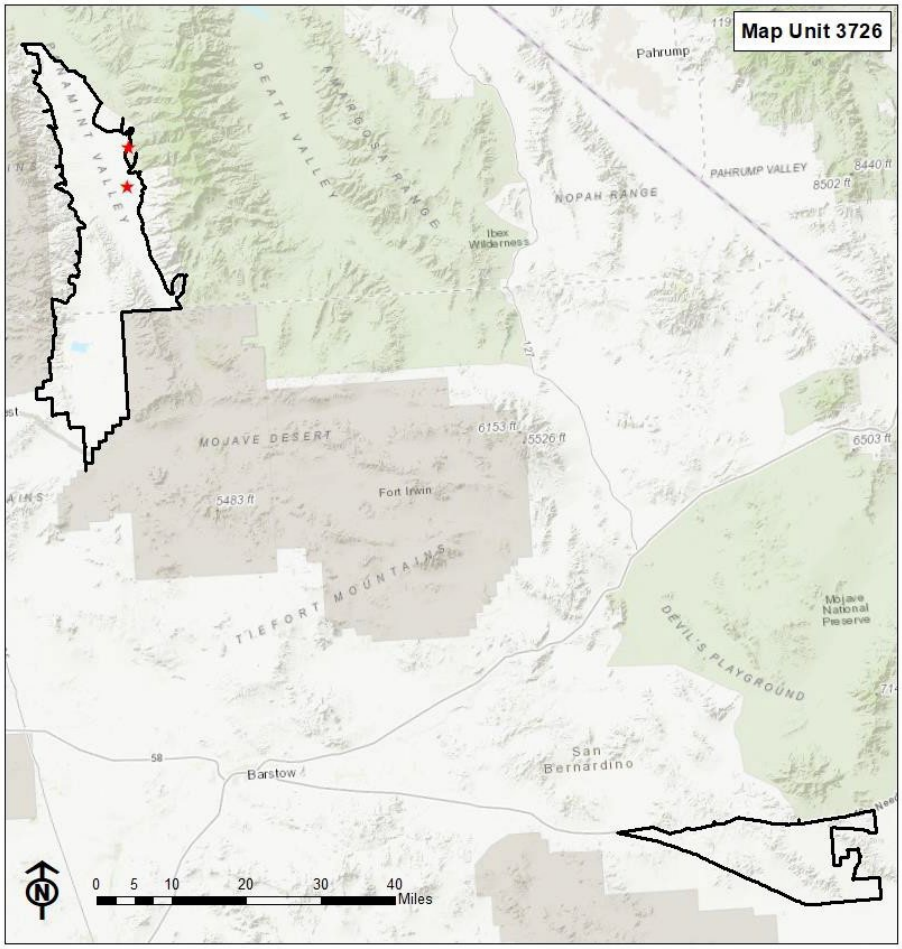
Distichlis spicata Alliance was mapped primarily from field data. Environmental correlates and/or photointerpretation signature attributes cannot reliably be established for this project.

PHOTOINTERPRETATION SIGNATURE: Signature color is variable, ranging from tan to light gray depending on how recently the herbaceous layer senesced. Texture is smooth but patterning is somewhat mottled. Herbaceous cover adjacent to more recent agricultural activity has some greenness to the signature color.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

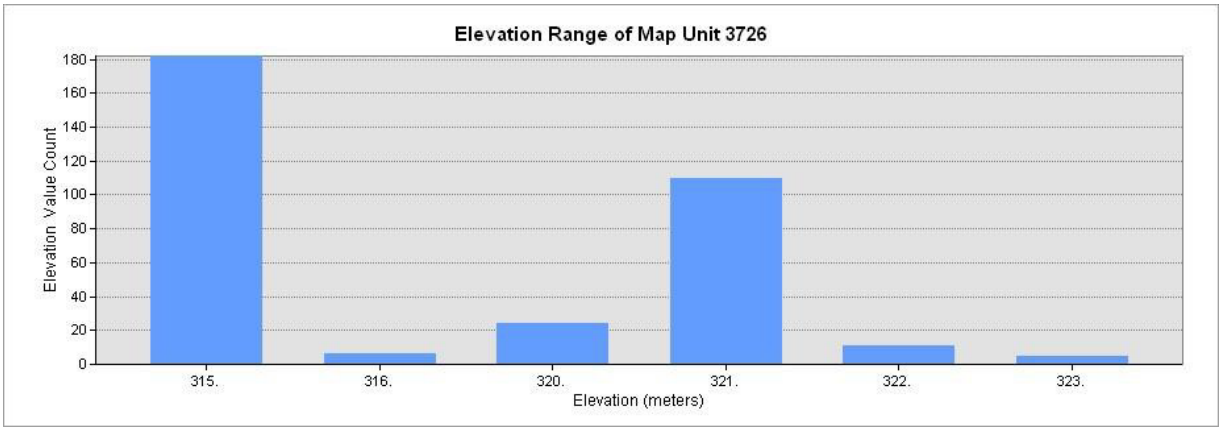
- Alliances within the Warm Semi-Desert/Mediterranean Alkali-Saline Wetland Macrogroup (3710 - 3729) – Typically, signature characteristics of herbaceous types within these alliances are poorly understood due to their similar environmental settings and limited distribution within the study area.

***Distichlis spicata* Alliance (3726)**

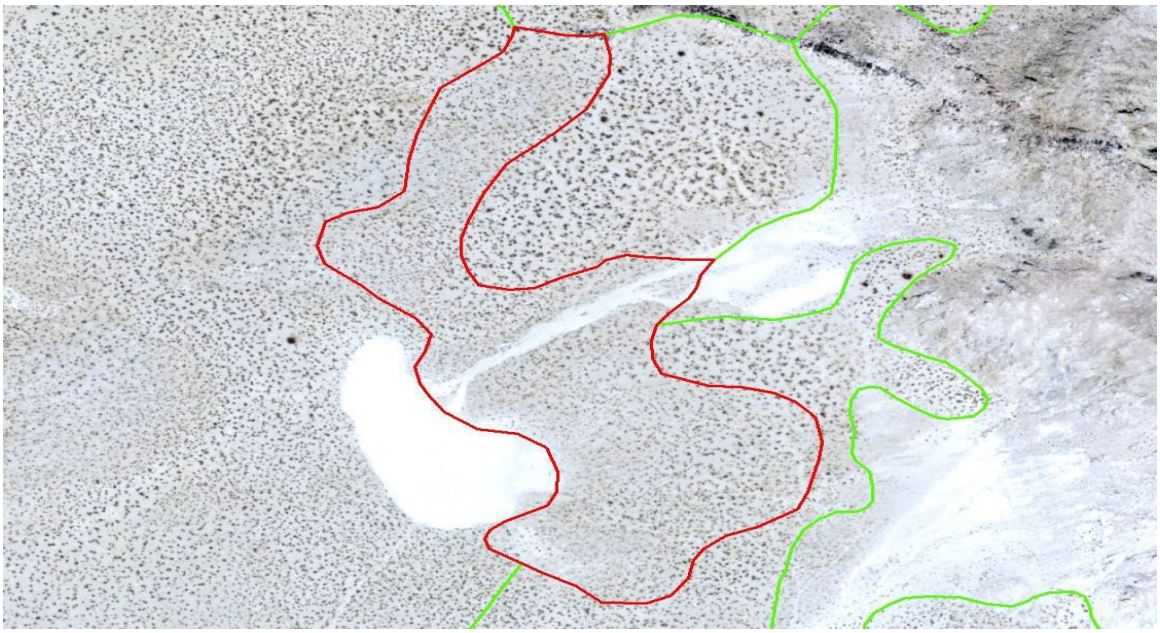


DISTRIBUTION: This type occurs infrequently over widely scattered locations in the western Mojave Desert, while small stands occur on isolated wet areas in the Salton Sea Trough zone. Stands are common along the Owens River in the Owens Valley. In the current study area, 3 polygons (the 2 northernmost polygons represented by one star) were mapped on the east side of Panamint playa in the Searles Valley subarea, based on field data, two of which have *Juncus* mixing. No sites were mapped in the West Mojave Trails A subarea.

***Distichlis spicata* Alliance (3726)**



Mediterranean California naturalized annual and perennial grassland Group (2330)



This aerial view shows several stands of considerable dead shrubs over moderate to dense non-native grass were noted in the Searles Valley. Consisting primarily of *Schismus* spp., the grasses represent the Mediterranean California naturalized and perennial grassland Group.

The ground photo shows *Schismus* spp., noted as the tawny grass here, forms a dense mat under dead shrubs, typically *Atriplex confertifolia*. Dead shrubs over grass were noted in many areas in the Searles Valley.

Mediterranean California naturalized annual and perennial grassland Group (2330)

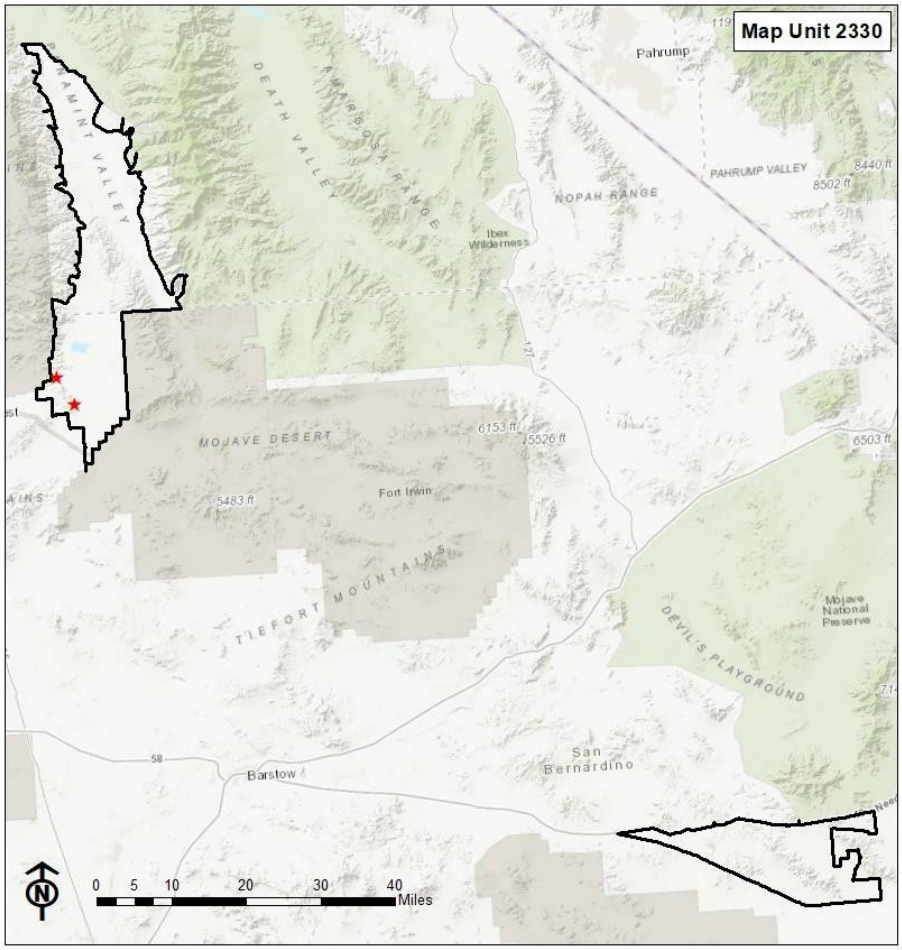
DESCRIPTION: Stands are strongly dominated by non-native herbaceous species, lacking evenly distributed diagnostic native plants (which usually constitute less than 5 percent of relative cover). Annual *Bromus, Schismus, Avena, Brassica,* and other non-natives are strongly dominant, with little regular cover of native herb species. This applies to multiple species of *Brassica* and related mustards including *Sisymbrium* sp. The species composition of this type varies from west to east in the DRECP region. Eastward, there is higher probability of high cover of *Brassica tournefortii* (Saharan mustard) and *Sisymbrium irio*. Westward, there is more likelihood of relatively pure stands of *Bromus rubens* and *Schismus* spp. along with *Sisymbrium altissimum*.

PHOTOINTERPRETATION SIGNATURE: Stands tend to have a highly variable signature both in patterning and color. Texture is generally very smooth. Since most available image sources were flown long after the annuals had senesced, signature color in the mapping effort tended to have differing hues of tans, browns, and grays. This high degree of variability corresponds both to species diversity and elapsed time in which the plants have undergone the final weeks of their annual growth cycle.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

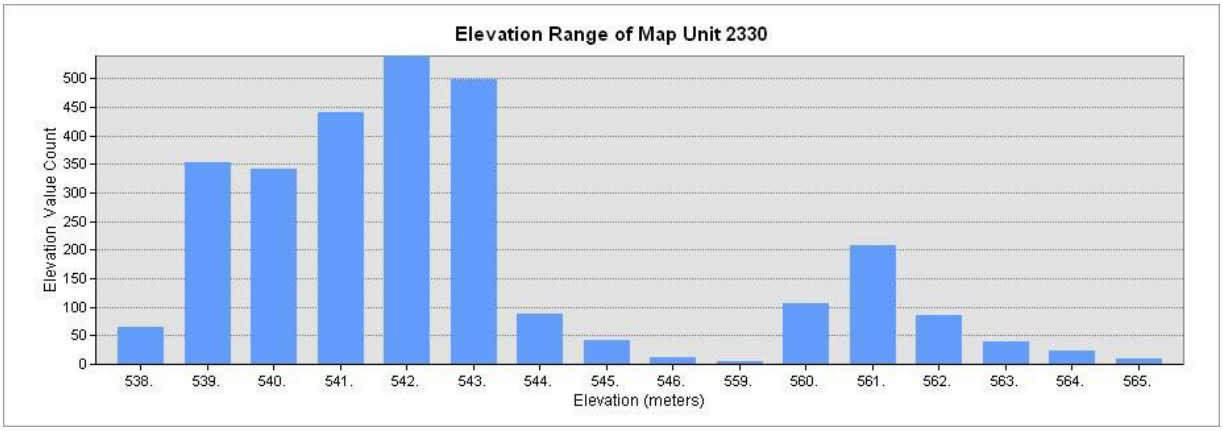
- California annual and perennial grassland Mapping Unit (Native component) (2305) – It is extremely difficult to discern the presence of native forbs and grasses in herbaceous vegetation; therefore, photo interpreters must rely primarily on the intensity, duration and nature of human-related activities affecting the stand. Stands containing a native component tend to occur away from extensive urban areas and large areas that were recently cultivated. The major exceptions to this rule are the showy flower fields and bunch grasses found in former dry-land farming sites in the western Antelope Valley.
- Sparse early seral stands of shrub cover – Many examples of early post disturbance cleared fields contain a sparse and inconsistent cover of shrubs such as *Eriogonum fasciculatum, Ericameria nauseosa, Ericameria cooperi,* and *Eriodictyon,* to mention a few. This cover may vary considerably between image datasets created in different years and also between the baseline imagery date and when subsequent field verification was undertaken.

Mediterranean California naturalized annual and perennial grassland Group (2330)



DISTRIBUTION: This mapping unit is found throughout most of the DRECP region with the exception of portions of the eastern Colorado Desert, the Yucca Valley-Twentynine Palms area, and western Antelope Valley. Highest concentrations occur in and around the heavily urbanized areas, and also along the Mojave River. In the current study area, this Group is mapped as 2 polygons based on field data in the Searles Valley subarea. One area is located near the Trona Pinnacles and contains *Schismus* and *dead Larrea tridentata* between stands of *Suaeda moquinii, Atriplex hymenelytra*, and *Larrea*. A second area occurs near the mouth of Poison Canyon on a “dead shrub plateau” in a Mud Hill-*Atriplex hymenelytra-Atriplex confertifolia* area. No sites were mapped in the West Mojave Trails A subarea.

Mediterranean California naturalized annual and perennial grassland Group (2330)

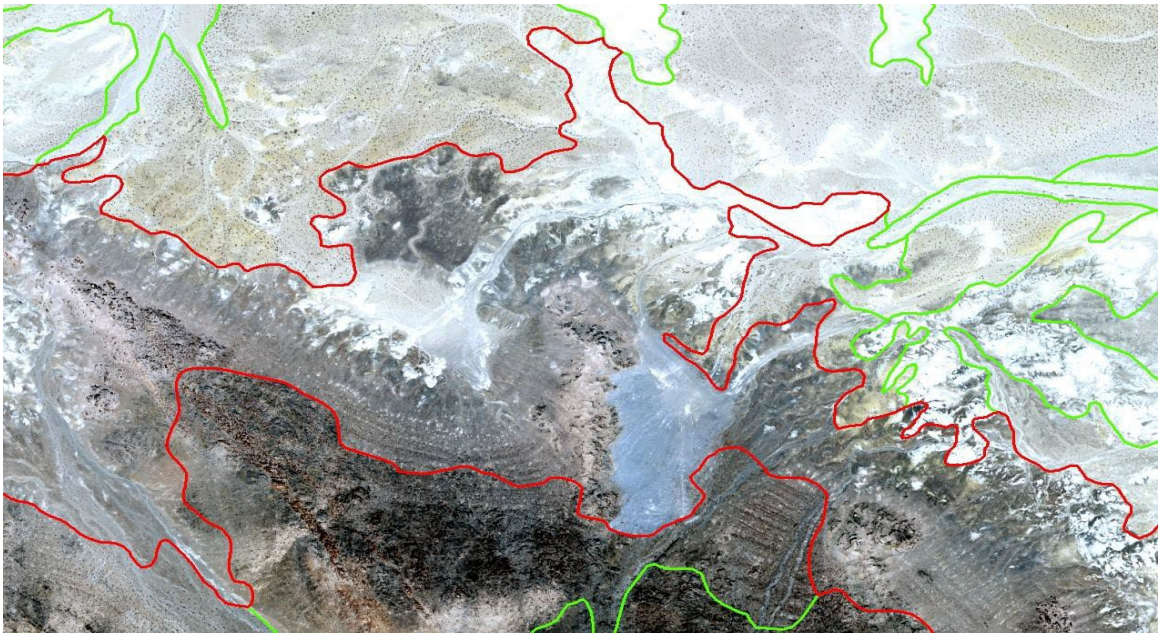


Sparse Types

- *Atriplex hymenelytra* Alliance (6111) SV
- *Chorizanthe rigida – Geraea canescens* Desert Pavement Sparsely Vegetated Alliance (6117) SV WMTA
- Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113) SV WMTA
- North American warm desert bedrock cliff and outcrop Group (6110) SV WMTA
- North American warm desert dunes and sand flats Group (6120) SV
- *Peucephyllum schottii – Pleurocoronis pluriseta Alliance (6118)* SV WMTA
- Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116) SV
- Unvegetated wash and river bottom Mapping Unit (6114) SV WMTA

Atriplex hymenelytra Alliance (6111)

Desert holly scrub Alliance



The aerial image shows *Atriplex hymenelytra* Alliance on light and dark-colored alkaline soils southwest of Searles Lake.

The ground photo shows sparse light-colored *Atriplex hymenelytra* on gravelly substrate just southwest of Searles Lake.

***Atriplex hymenelytra* Alliance (6111)**

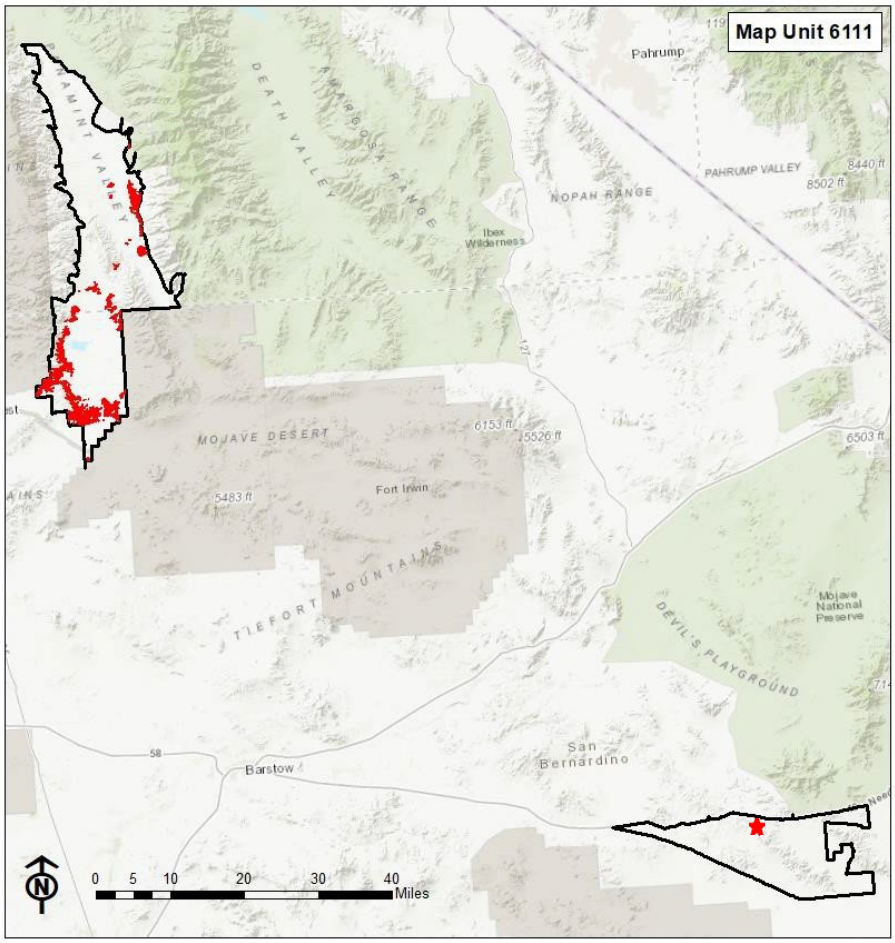
DESCRIPTION: *Atriplex hymenelytra* comprises more than 1 percent of the cover and no other woody species has equal or higher cover, except *Larrea tridentata* or *Ambrosia dumosa*, which may co-dominate. This alliance often occurs on hot rocky slopes, dry bajadas, or alkaline badlands and playa edges. Stands are generally considered "sparsely vegetated" (mostly less than 2 percent shrub cover). However, some stands can have up to 10 percent shrub cover under certain circumstances. Stands that are co-dominated by *Atriplex confertifolia* are mapped as the *Atriplex confertifolia* Alliance.

PHOTOINTERPRETATION SIGNATURE: *Atriplex hymenelytra* occurs in a very sparse cover of shrubs, usually on the lower slopes of dark volcanic hills. It is also mapped on steep fan/pediment surfaces and washes downslope of alkaline rocky hills. *A. hymenelytra* is also scattered on some pavement surfaces and some eroding old fans with pavement surface. Darker surfaces tend to accentuate the sparse cover of very pale shrubs.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

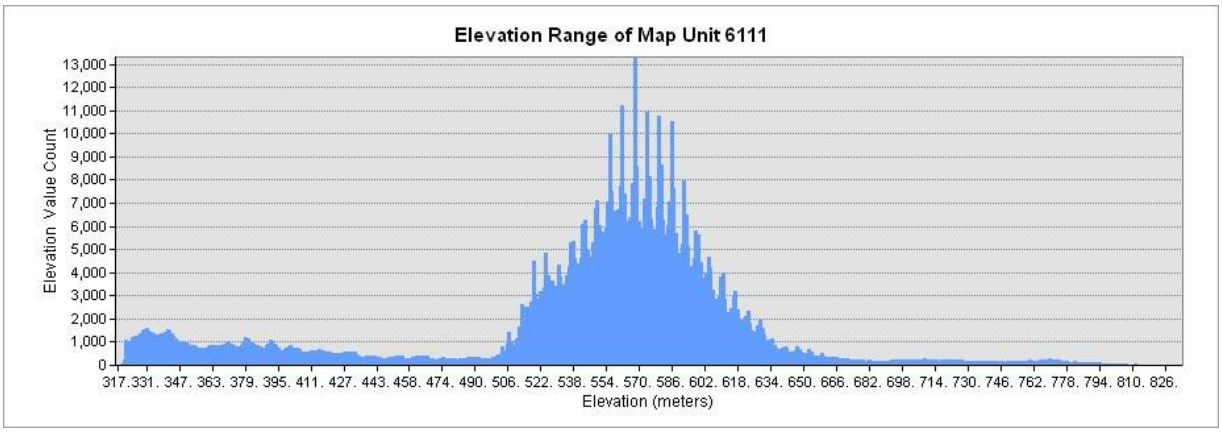
- *Ambrosia dumosa* Alliance (4111) – At times, a sparse cover of this species can occur on substrate similar to that of *A. hymenelytra,* making it difficult to discern the two species.
- *Chorizanthe rigida - Geraea canescens* Desert Pavement *S*parsely Vegetated Alliance (6117) – Stands mapped to this mapping unit often have a medium to dark gray substrate. This makes shrubs dominated by the light-colored *A. hymenelytra* easily visible even in sparse cover. If the cover is inconsistent across the pavement surface and below 2 percent, photo interpreters map to this type.
- Massive sparsely vegetated rock outcrop Mapping Unit (6115) – Areas mapped to rock outcrops are very sparsely vegetated with rough hard-surface terrain and are often very steep, creating frequent shadowing.
- Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113) – The Mud Hills type is very sparsely vegetated, usually associated with a highly eroded fine-textured sedimentary substrate. The overall topography is highly variable, often resulting in complex badland landscapes. Substrate color is patchy and highly variable due to the often-changing soil chemistry and geology over small areas.

***Atriplex hymenelytra* Alliance (6111)**



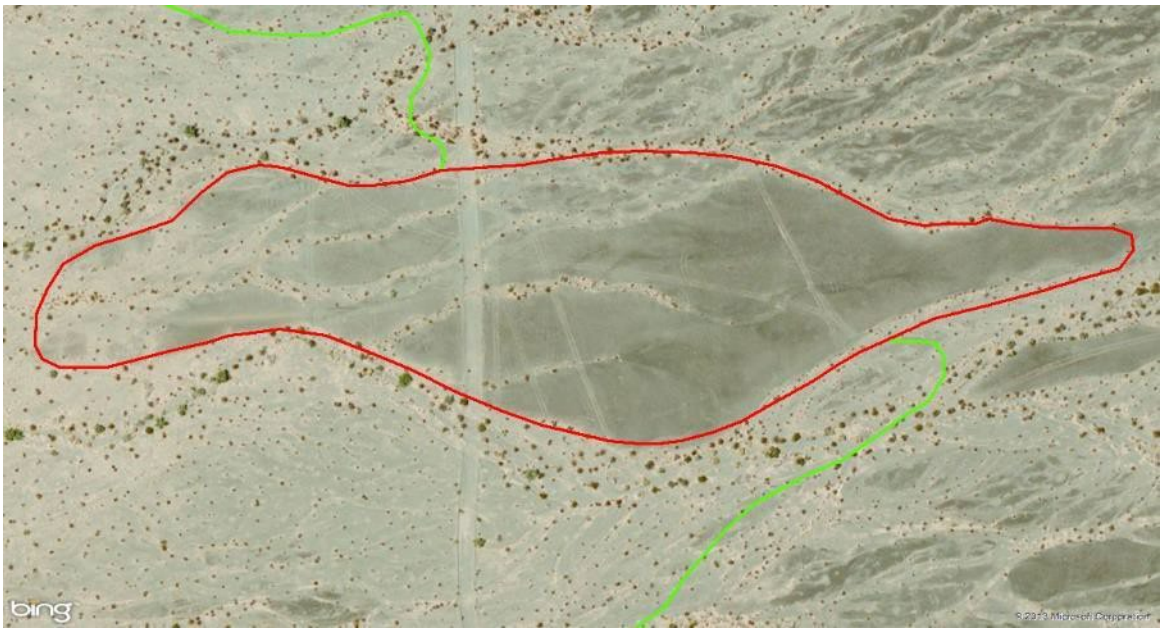
DISTRIBUTION: The *Atriplex hymenelytra* Alliance is mapped as scattered sites in the Northern, Central, and Eastern Mojave regions, and at a few sites in the Colorado Desert. In the current study area, *Atriplex hymenelytra* is mapped fairly commonly in the Searles Valley subarea, ringing Searles playa, with a heavy concentration around Trona Pinnacles. Also, large stands are mapped on Panamint Range fans east of Panamint playa. One polygon (represented as a red star) was mapped in Bristol Mtns in the West Mojave Trails A subarea.

***Atriplex hymenelytra* Alliance (6111)**

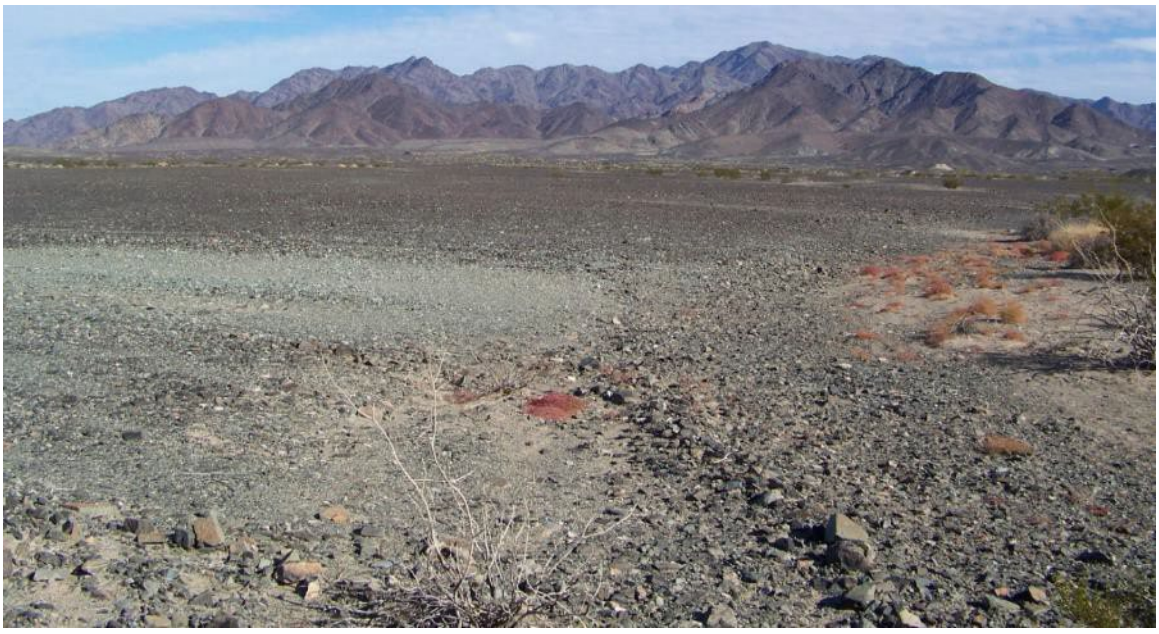


Chorizanthe rigida - Geraea canescens Desert Pavement Sparsely Vegetated Alliance (6117)

Spiny herb – Desert gold Desert Pavement Sparsely Vegetated Alliance



This aerial view shows a Desert Pavement example on an upper bajada. Note the narrow rills with concentrations of *Larrea tridentata* dissecting the interfluves of nearly unvegetated darker pavement.



A ground photo view of Desert pavement surfaces that can range from a very dark to light tone. Here the pavement surface itself is devoid of shrubs, while the rill edge at the right contains *Larrea tridentata*.

***Chorizanthe rigida - Geraea canescens* Desert Pavement Sparsely Vegetated Alliance (6117)**

DESCRIPTION: Stands usually are gradually sloping, but often are characterized by small cobbles or rock fragments, the result of long-term weathering of alluvial fans/bajadas and lava flows at the bases of mountains. Settings are often very sparsely vegetated with few widely scattered shrubs (except in small rills and washes). Herbs are abundantly present following significant rainfall events. The mapping unit is often characterized by old dark alluvial surfaces with no shrub cover on gradual to moderate slopes. Diagnostic herbs, such as *Chorizanthe rigida, C. brevicornu, Geraea canescens*, *Aliciella latifolia, Nama pusillum,* and *Phacelia rotundifolia,* persist as dead skeletons for many months, yet herbaceous skeletons are often lacking especially on harsh substrates. In the eastern deserts, as near the Colorado River, surfaces are very dark with "desert varnish" due to age of exposure. Younger surfaces to the west, with slightly higher average precipitation, have more regular annual residual vegetation. In the western Mojave, some stands have annuals regularly present, including non-natives such as *Bromus rubens* and *Schismus* spp. Currently the entire suite of "desert pavements" across warm California deserts are considered members of this alliance.

PHOTOINTERPRETATION SIGNATURE: This type is a sparsely vegetated landform, often dissected by narrow rills containing a sparse to rather dense cover of shrubs. Overall, vegetative cover is less than 2 to 4 percent, almost entirely occurring in the narrow rills that are less than the MMU and whose distribution is not representative of the polygon. The pavement surface itself is for the most part entirely devoid of woody vegetation. The image signature depicts a smooth texture with a dark brown-black or dark gray color that can occasionally vary to lighter tones. The color tone may change across the surface.

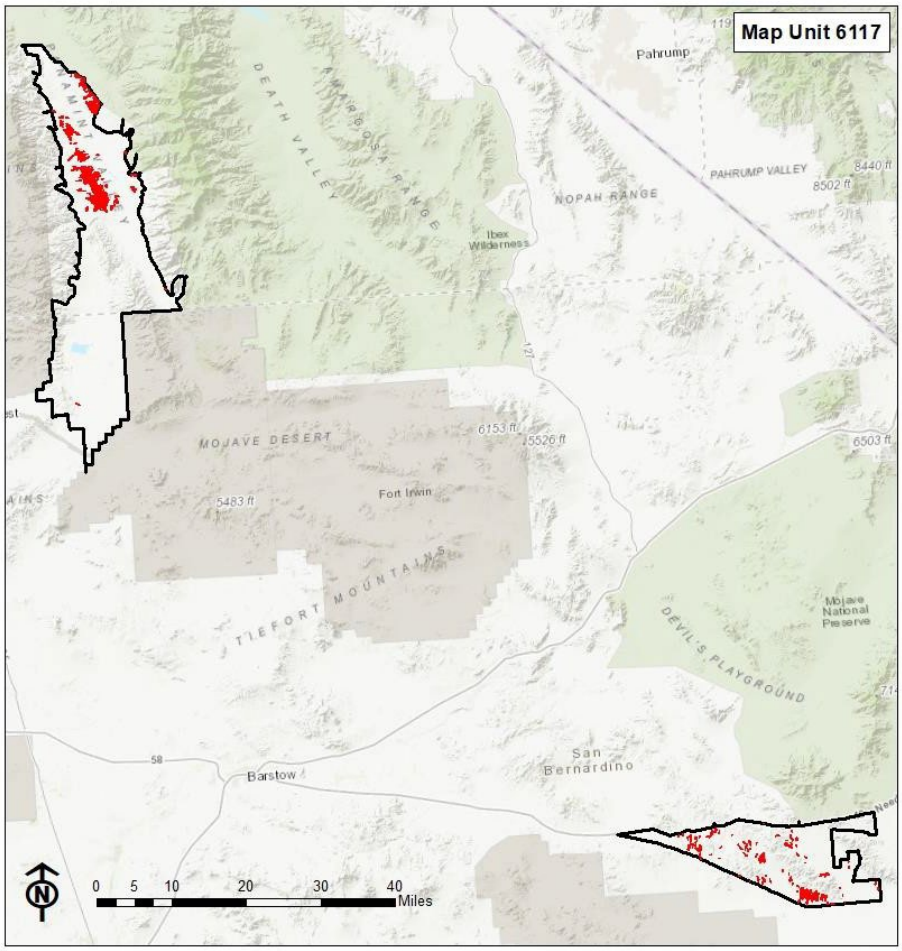
TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

- *Atriplex hymenelytra* Alliance (6111) – The *A. hymenelytra* Alliance on desert pavement landforms has small light-colored shrubs scattered on the pavement surface. This type is mapped from field data and locally extrapolated.
- *Larrea tridentata - Ambrosia dumosa* (4115)*, Larrea tridentata - Encelia farinosa* (4118)*,* and *Larrea tridentata* (4119) Alliances – These types are mapped on pavement areas where shrubs are present on the pavement surface, and/or where the vegetated rills of the pavement area are evenly distributed across the pavement polygon. Total cover of the pavement polygon is above 3 to 4 percent. If a vegetative type is assigned to the pavement, it reflects the surrounding vegetation type.
- North American warm desert bedrock cliff and outcrop Group (6110) – Pavement surfaces can be tectonically altered to where they may be difficult to distinguish from other darker colored slopes that occur on typically higher, more complex terrain. In these settings, it may be necessary to map to the more generalized Group-level category.

***Chorizanthe rigida - Geraea canescens* Desert Pavement Sparsely Vegetated Alliance (6117)**

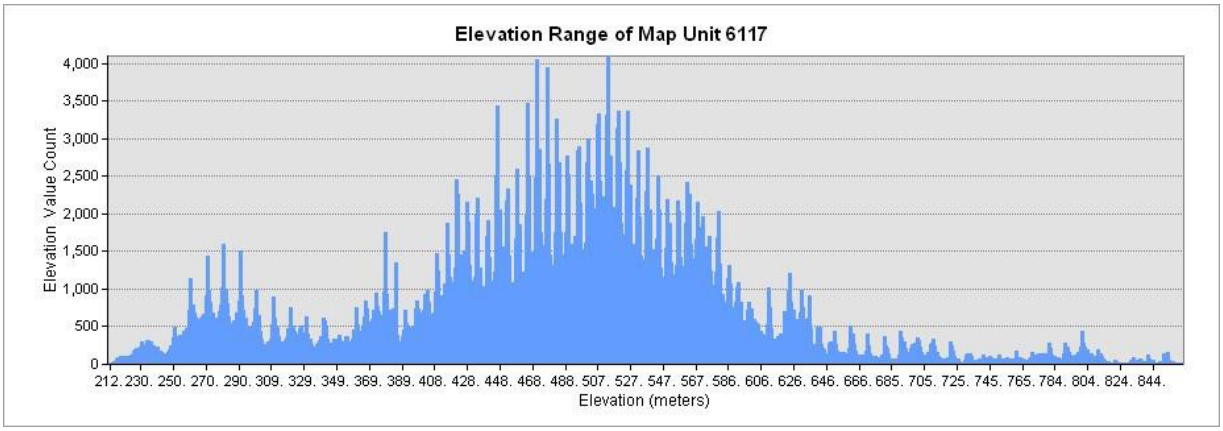
- Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116) – In certain settings, pavement surfaces come in close contact with the edges of the playa. In these situations, pavement color is significantly lighter than average and can be confused with the drier margins of the playa. Overall, herbaceous cover is slightly higher along the playa margins than on the pavement and can be detected on the NAIP color infrared (CIR) imagery. Raised lake terraces of Mud Hills at the edge of playas may also add to the confusion.

***Chorizanthe rigida - Geraea canescens* Desert Pavement Sparsely Vegetated Alliance (6117)**

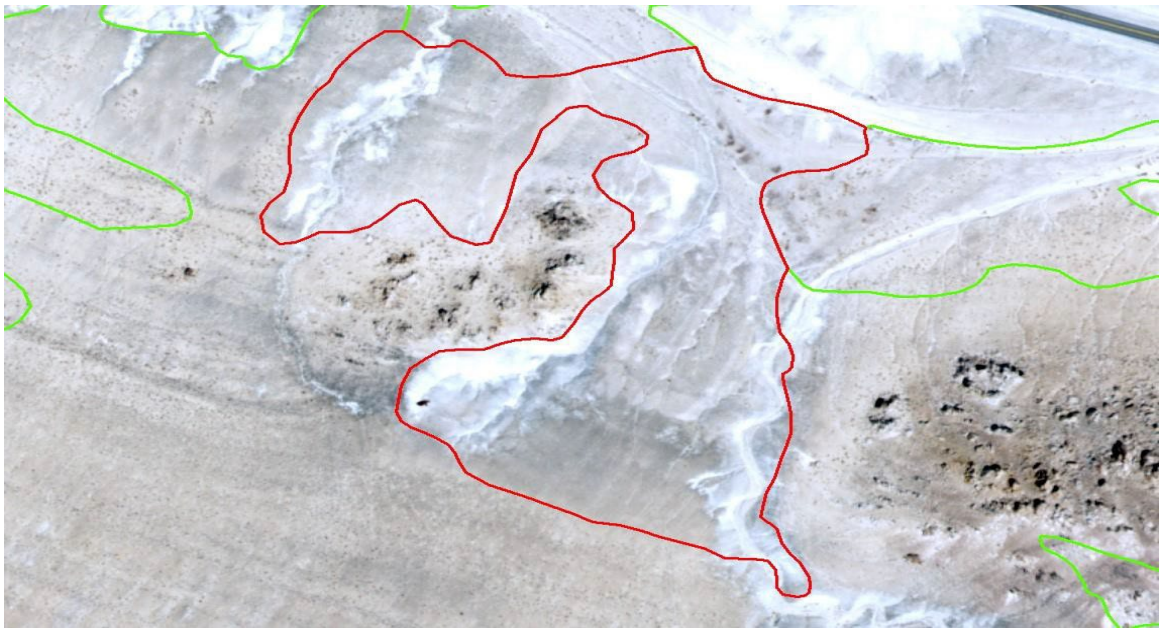


DISTRIBUTION: The *Chorizanthe rigida - Geraea canescens* Desert Pavement Sparsely Vegetated Alliance is very prevalent and extensive in the Colorado Desert and the Eastern Mojave Desert. It is fairly sparsely scattered in the Northern and Central Mojave Desert. In the current study area, the alliance extensively mapped in the Panamint Valley of the Searles Valley subarea. It is also common and mapped throughout the West Mojave Trails A subarea.

***Chorizanthe rigida - Geraea canescens* Desert Pavement Sparsely Vegetated Alliance (6117)**



Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113)



This aerial image shows a rather low slope low relief undulating example of Mud Hills substrate at the base of the Argus Range just outside of Trona. Note the light gray to white coloring of the alkaline soil.

This ground photo shows very sparse vegetation the undulating terrain of a low relief example of Mud Hills Mapping Unit, just south of Trona upslope from Searles Lake.

Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113)

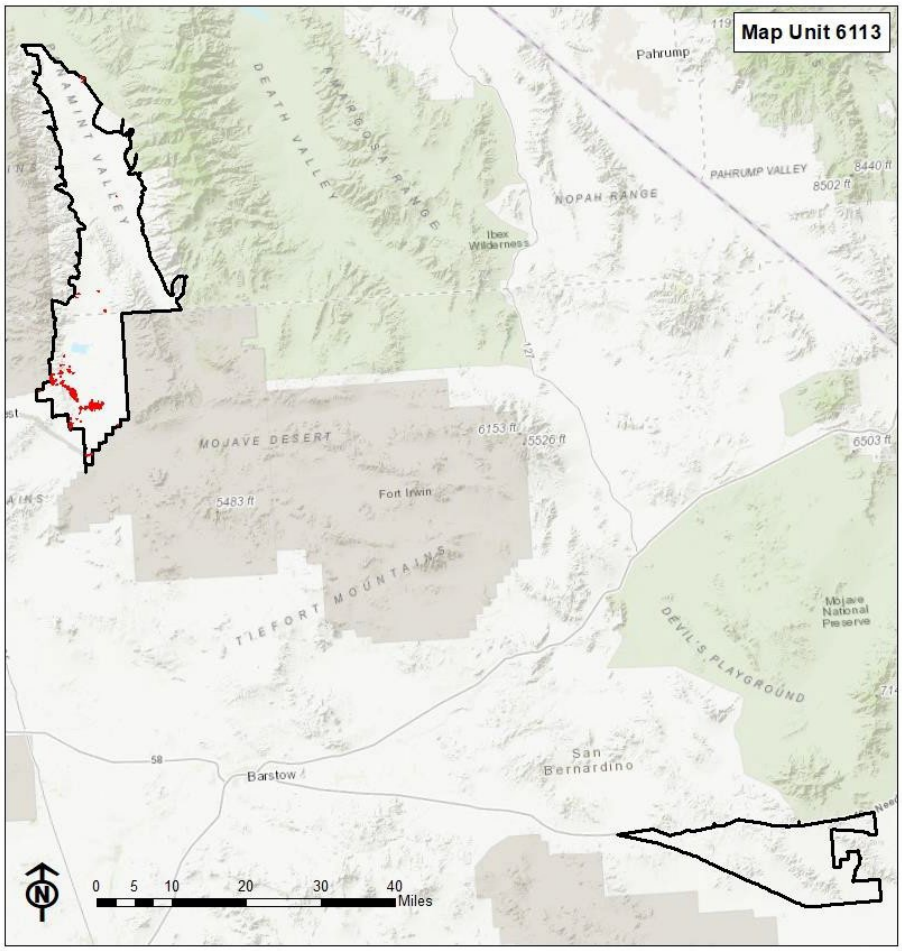
DESCRIPTION: This mapping unit is usually sparsely vegetated with less than 2 percent shrub or herb cover. Substrate is composed of unconsolidated and uncemented fine, sometimes alkaline, sediments. These substrate variations result in highly diverse but typically sparsely vegetated slopes. The landscape can be made up of a matrix of small patches of shrubs or herbs (below 10 acres) at 2 percent cover interspersed with larger areas of little or no measurable cover of herbs or shrubs. Topography can often be very rugged and eroded ("badlands"), however, in some areas, the same species may occur on relatively flat terrain adjacent to edges of playas and in broad valleys. In many years, these areas are largely unvegetated. Some species that may occur are *Atriplex hymenelytra, Atriplex confertifolia, Stanleya pinnata* and other woody species. In El Niño years clay slopes are heavily covered with annual *Eriogonum* species, probably most commonly *E. inflatum* (many sizes and morphs of this plant). This and other species of *Eriogonum*, along with *Plantago ovata, Chorizanthe* spp.*,* and sometimes *Lepidium lemmonii, Coreopsis calliopsidea,* and other species, can lend noticeable color to these exposures.

PHOTOINTERPRETATION SIGNATURE: The photo signature shows very little to no vegetation. Typically, this mapping unit occurs on badland topography or eroded hills with an unpredictable mosaic of white, tan, pink, and gray colors, and a smooth texture in the interfluves.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

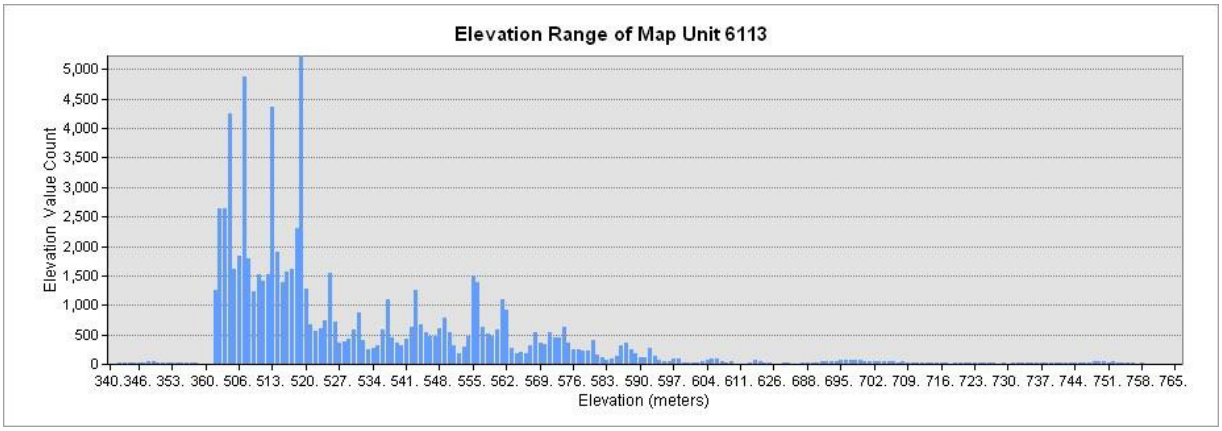
- *Atriplex hymenelytra* Alliance (6111) – Small light-colored *A. hymenelytra* shrubs are consistently scattered with low cover. This species often is a component to mud hills topography. If shrubs are visible, cover is most likely at least 2 percent, and therefore should be mapped to this alliance.
- *Chorizanthe rigida - Geraea canescens* desert pavement sparsely vegetated Alliance (6117) – Topography on this landform is less complex; surface color, which ranges in color from light gray to dark gray, is more uniform across the stand. There are generally no pastel pinks, oranges, browns or light purple colors. Dissection in mud hills topography is more complex; even in more recently developed mud hill topography the dendritic pattern is apparent. Confusion occurs on what appear to be raised playa edges that could be Mud Hills lake terraces or light-colored pavement. In most cases they are considered as Mud Hills.
- Massive sparsely vegetated rock outcrop Mapping Unit (6115) – Signature usually shows extensive rough hard-surface terrain, usually not in an eroded badland pattern. Colors on massive rock substrate are not pastel-like in tone.
- North American warm desert bedrock cliff and outcrop Group (6110) – Sparsely vegetated landscapes should be mapped to this Group when it is difficult to discern the Mud Hills Mapping Unit from any of the other types in this Group.

Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113)



DISTRIBUTION: The Mud Hills sparsely vegetated ephemeral herbs Mapping Unit is concentrated in the northern part of the DRECP area, in the Western Mojave and Central Mojave regions. It is also very prevalent in the Western part of the Colorado Desert west of the Salton Sea/Imperial Valley. Otherwise, it is mapped in scattered locations in the Central and Eastern Mojave and eastern Colorado Desert. In the current study area, the Mapping unit is mapped in the southern part of the Searles Valley subarea, near the south end of the Argus Range near the mouth of Poison Canyon, and at the base of the Trona Pinnacles. There are few sites in the Panamint Valley. No sites are mapped in the West Mojave Trails A subarea.

Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113)



North American warm desert bedrock cliff and outcrop Group (6110)

The aerial photo view shows areas of sparsely vegetated rocky slopes with

minimal amounts of unconsolidated surfaces in the Marble Mountains.

The ground photo shows rocky outcroppings interfacing with small areas of some soil development.

North American warm desert bedrock cliff and outcrop Group (6110)

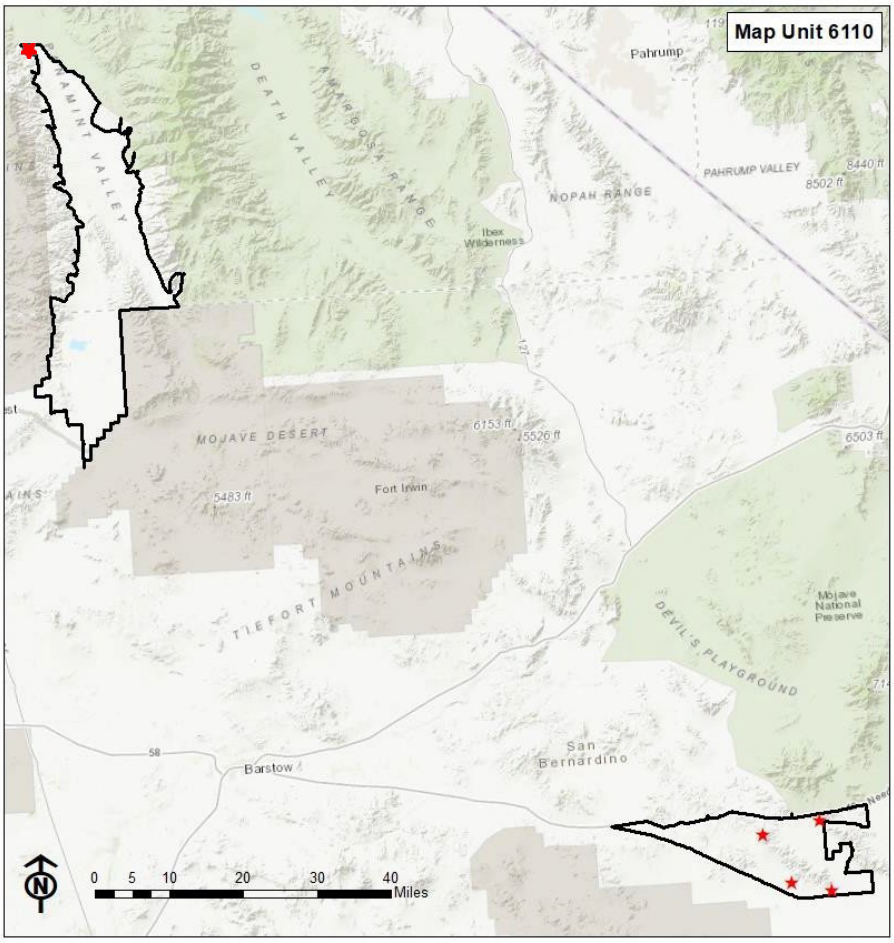
DESCRIPTION: This is a Group-level category consisting of rock outcroppings, sparsely vegetated alliances (*Ephedra funerea, Atriplex hymenelytra,* etc.*)*, alkaline lacustrine derived hills (mud hills), pavement surfaces with diagnostic plants, playas, washes and riverine flats, and complexes of two or more of any of the above. Stands are mapped to this level when it is difficult to discern to any of the abovementioned map units. Also, stands are mapped to this level in this Group when vegetation falls below 2 percent absolute cover.

PHOTOINTERPRETATION SIGNATURE: Image signature varies considerably depending on the substrate origin, post weathering dynamics, and subsequent tectonic events. The substrate is more influential than floristics in determining the signature.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

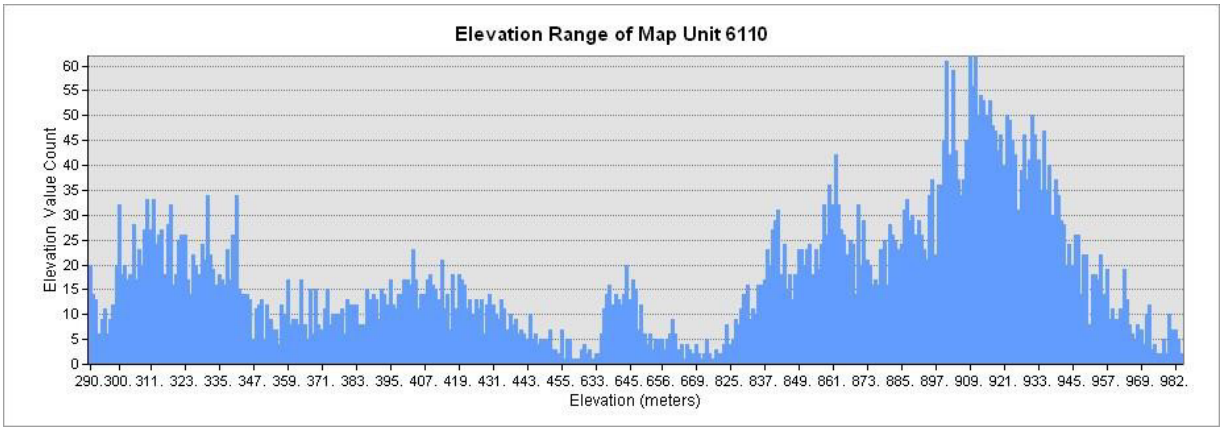
- Low cover floristically defined stands of vegetation where the substrate is the primary signature on the imagery.

North American warm desert bedrock cliff and outcrop Group (6110)



DISTRIBUTION: The Group is infrequently mapped in the Northern, Central, and Eastern Mojave, and the northeastern Colorado Desert. It is more commonly mapped in the southeastern Colorado Desert and in the Jawbone Canyon area. In the current study area, this Group is mapped as 1 polygon at north end of Panamint Valley, on a fan from Argus Range, in the Searles Valley subarea. There are 4 sites mapped in the West Mojave Trails A subarea, at the north end of Marble Mtns, north of Amboy on a Marble Mountain fan, and in the Bristol Mountains.

North American warm desert bedrock cliff and outcrop Group (6110)



North American warm desert dunes and sand flats Group (6120)

This aerial image shows the typical white signature of a sandy flat (red polygon). Stands of *Larrea tridentata - Ambrosia* dumosa and *Larrea tridentata - Encelia farinosa* cover the mountain west and north of the polygon; a stand of *Chilopsis linearis* is in the wash to the south and east of the polygon.

Low dunes and sand flats with very sparse vegetation are exhibited in this ground photo.

North American warm desert dunes and sand flats Group (6120)

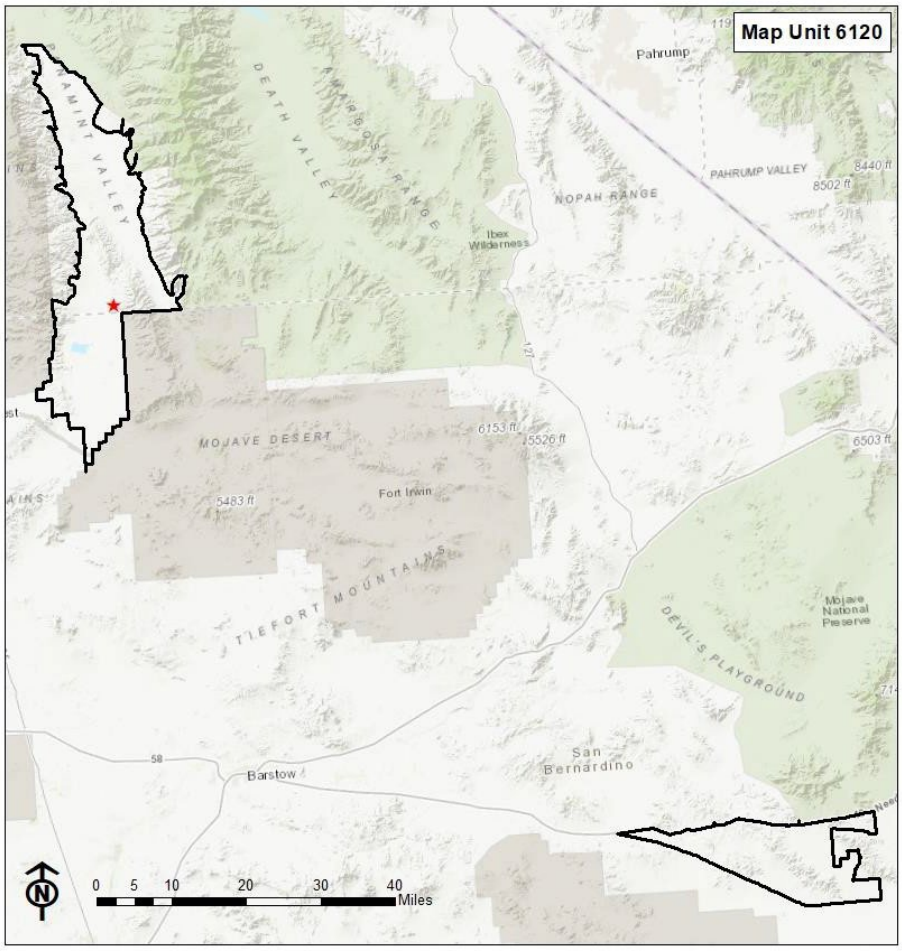
DESCRIPTION: This category was used for sparsely vegetated to unvegetated open sand dunes, sand aprons, and sandy flats. The vegetation is generally sparse to very open (at least 2 to 10 percent cover) except for annual blooms in favorable years. The vegetation type was assigned to the Group level when signature and ecological characteristics were inconclusive, making photointerpretation and modeling/ extrapolation for specific alliance calls difficult. In the study area, this was used mostly when field work did not substantiate a more detailed call such as the *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Alliance. *Eriogonum desertorum* may be found in this mapped Group. Active unstable dunes are included in this Group. More stable sand sheets and dune complexes are mapped to the *Dicoria canescens – Abronia villosa – Panicum urvilleanum* Alliance.

PHOTOINTERPRETATION SIGNATURE: Sandy areas typically have a white to light tan or light gray signature. Dunes tend to have a hummocky appearance whose topography is highlighted by vegetative edges in low relief areas or by shadows. Specific dune alliances within this Group are mapped from field data and locally extrapolated.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

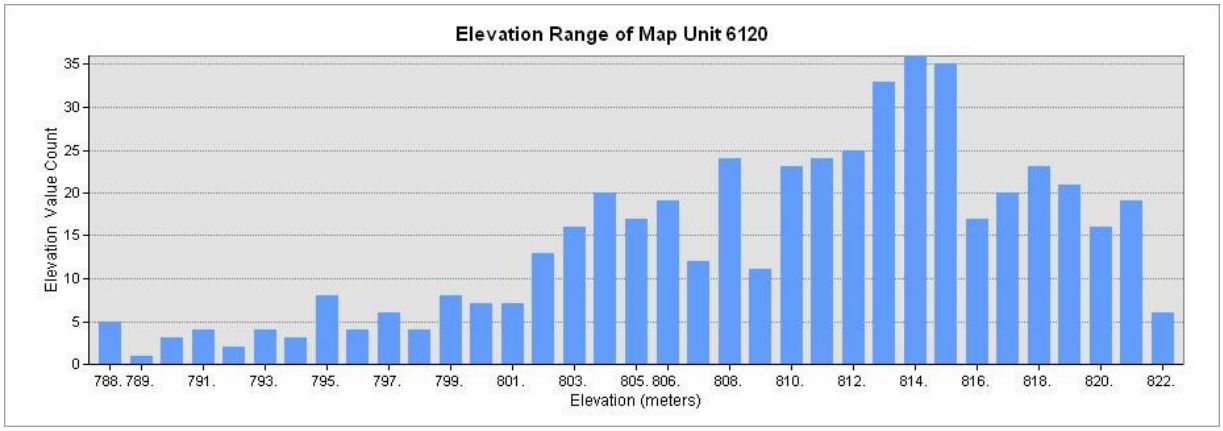
- Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116) – Large sand sheets occur adjacent to or nearby smaller playas, both of which are occurring on minimal slope. It is possible to differentiate these features by looking at in-stand and adjacent vegetation in addition to surface drainage patterns.
- Unvegetated wash and river bottom Mapping Unit (6114) – This type occupies the active channel portion of dry washes and rivers. Substrate may be sand, cobble, or rock. No dune-like forms are present.

North American warm desert dunes and sand flats Group (6120)



DISTRIBUTION: This Group, composed of sand dunes, sand aprons, and sand flats has a number of scattered locations in the Western, Central and Eastern Mojave Desert, as well as in the Colorado Desert. In the current study area, this Group is mapped at one location at the upper end of Searles Valley in the Searles Valley subarea. No sites are mapped in the West Mojave Trails A subarea.

North American warm desert dunes and sand flats Group (6120)



Peucephyllum schottii Alliance (6118)

Desert fir Alliance

This aerial image shows a *Peucephyllum schottii* stand with low cover along a sparse rocky wash at the edge of the Panamint Valley.

The ground photo shows dominant *Peucephyllum schottii* in a rocky cobbly sparsely vegetated wash.

***Peucephyllum schottii* Alliance (6118)**

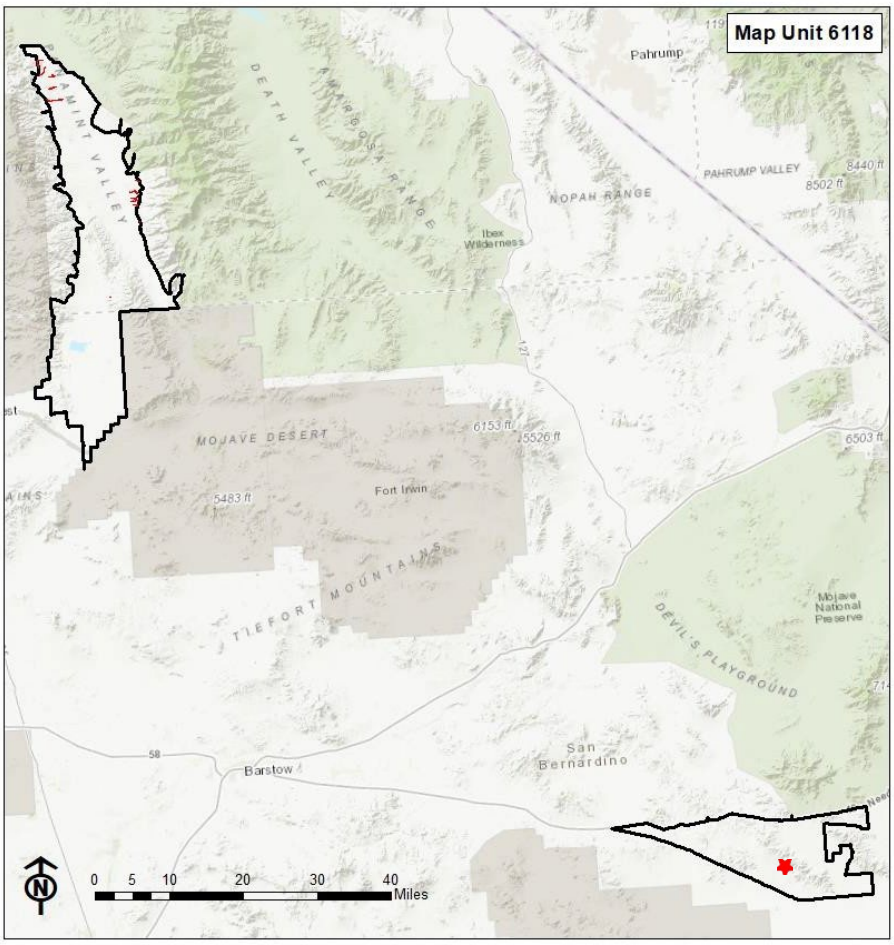
DESCRIPTION: Stands typical of steep massive outcrops of basalt or calcareous rocks (cliffs and scree) at lower elevations across the study area. The bright green arborescent shrub *Peucephyllum schottii*, *Eucnide urens,* and/or *Pleurocoronis pluriseta* is characteristic in the stand, but is often only 1-5% total cover. *Peucephyllum* is an arborescent shrub, is vivid green and densely leafy, with narrow, almost needlelike leaves, and resembles *Larrea tridentata*. Stands are mapped in local areas in which there were field observations of the type. Stands of *Peucephyllum* have been noted dominating in sparse rocky/cobbly wash settings on uppermost fans in the northwest and southeast Panamint Valley.

PHOTOINTERPRETATION SIGNATURE: Stands are generally very open on steep, rocky substrates of varying aspects. For this project, stands are for the most part in upper fan rocky/cobbly wash settings. Individual shrubs are irregularly shaped and appear dark green to black. There is generally very little herbaceous understory associated with this sparsely vegetated alliance.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

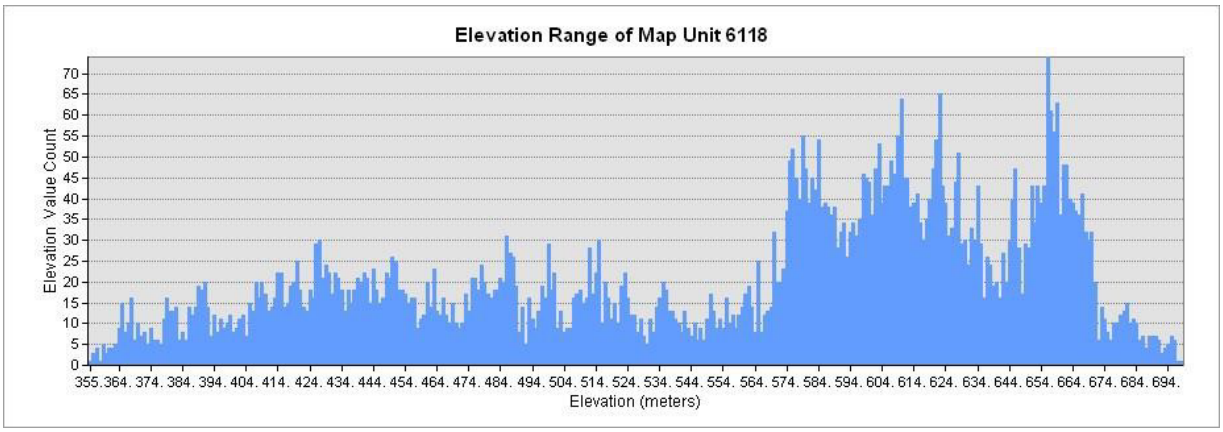
- *Ambrosia salsola* – *Bebbia juncea* Alliance (7211) – These shrubs are significantly smaller in size, have a lighter gray color, and occupy stream terraces and lower-energy washes.
- *Ericameria paniculata* Alliance (4213) –These plants are difficult to discern from *Peucephyllum* due to their similar crown shape, and texture. This species tends to occur in lower-energy washes.
- *Larrea tridentata* Alliance (4119) – *Larrea tridentata* may also occur adjacent to *Peucephyllum* wash stands, but is less irregularly shaped and is lighter in color due to a less dense crown.
- *Larrea tridentata* – *Encelia farinosa* Alliance (4118) – This alliance can occur adjacent to *Peucephyllum* wash stands. But generally, shows the gray mounded signature of *Encelia farinosa*.

***Peucephyllum schottii* Alliance (6118)**

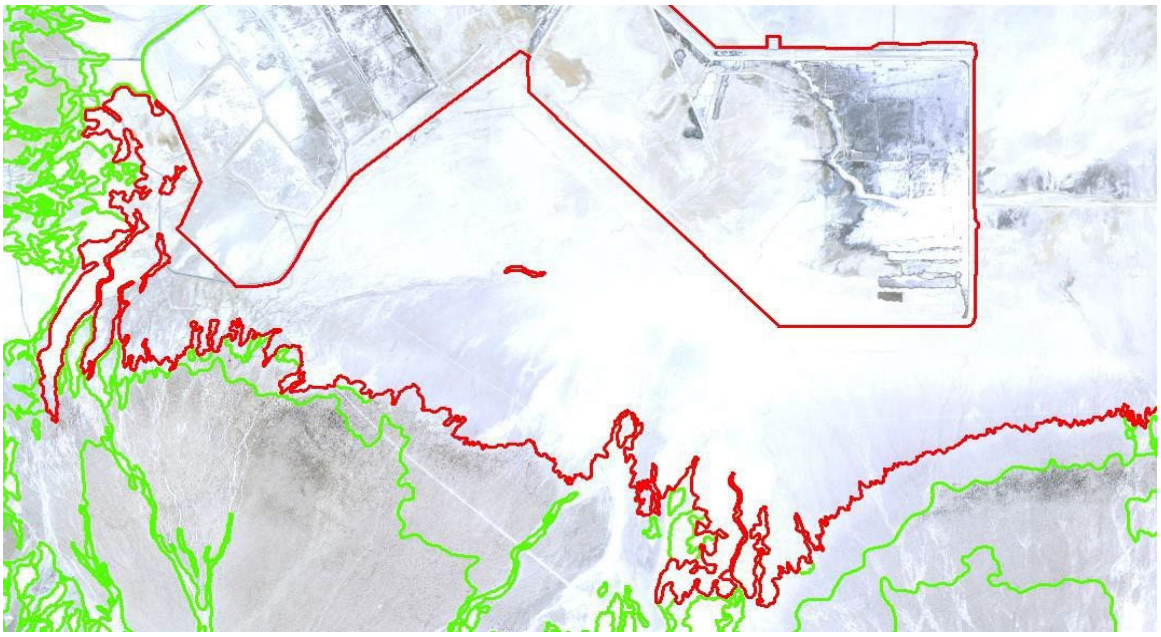


DISTRIBUTION: Most mapped occurrences in previous projects are rather rare, but found in upland rocky settings similar *Larrea tridentata – Encelia farinosa* Alliance. In the current mapping, in the Searles Valley subarea, it was mapped in washes on upper fans at the north end of the Panamint Valley below the Argus Range and in washes emerging from Panamint Range just south of Ballarat. In the West Mojave Trails A subarea, only 1 site was mapped in a canyon in Bristol Mountains.

***Peucephyllum schottii* Alliance (6118)**



Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116)



This aerial image shows the Searles Lake playa almost totally devoid of shrubs. Note the mining area to the north.

The ground photo shows the Searles Lake sparsely vegetated playa seen here with its lack of shrubs and grasses on a dry, cracked alkaline substrate.

Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116)

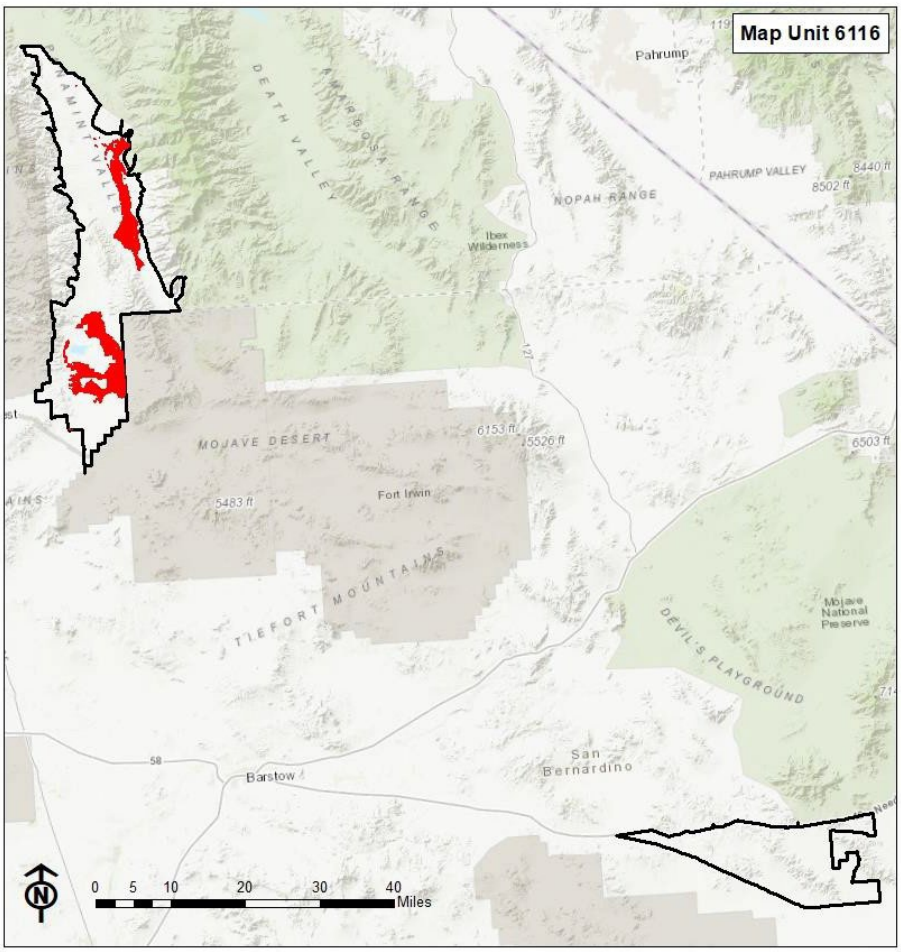
DESCRIPTION: This mapping unit defines silty, clay, or salt crust playa (dry lake) surfaces throughout DRECP region. Characteristics include moderate to highly reflective cracked substrate with no obvious slope. Most of the time playas, whether they are salty, silty, or clay, have less than 2 percent vegetative cover. However, annuals such as *Monolepis nuttalliana, Atriplex elegans, A. phyllostegia, Chenopodium spp.,* and others may occur in relatively high cover during wetter El Niño years. Even with this temporal growth, these sites are still identified as playas.

PHOTOINTERPRETATION SIGNATURE: Areas are mostly devoid of shrubs and herbaceous plants, reflecting a gray to white to tan color depending on alkalinity and moisture content of the soil. They occur in the lowest portions of watersheds and drainages. Shrubs can occur in isolated low-gradient rills or cracks within the surface.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

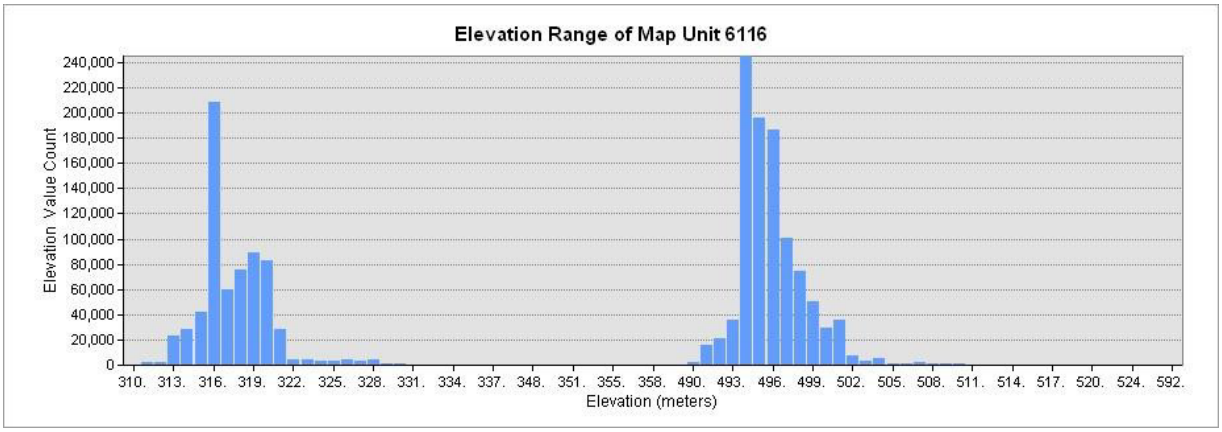
- *Chorizanthe rigida* – *Geraea canescens* Desert Pavement Sparsely Vegetated Alliance (6117) – This type typically occurs adjacent to the mountains, forming alluvial fans that are usually darker in color. This alliance is also distinguished by dissecting rills that many times are vegetated and run throughout the pavement surface. Confusion occurs on what appear to be raised playa edges that could be Mud Hills lake terraces or light-colored pavement. In most cases they are considered as Mud Hills.
- Mud Hills sparsely vegetated ephemeral herbs Mapping Unit (6113) – In settings with minimal topographic variability, this mapping unit can at times be similar to older playa surfaces. In these situations, the Mud Hills Mapping Unit generally has a higher color variability across the surface, usually with subtle pink, orange, and/or gray hues to the signature in addition to at least minimal amounts of surface dissection. Raised lake terraces at the edge of playas can add to the confusion.
- North American warm desert dunes and sand flats Group (6120) – In several location large sand sheets occur adjacent to or nearby smaller playas, both of which are occurring on minimal slope. It is possible to differentiate these features by looking at in-stand and adjacent vegetation in addition to surface drainage patterns.
- Types within the California Annual and Perennial Grassland Macrogroup (2300) – In most cases herbaceous cover appears light brown and does not have a high reflectance. Many times, scattered shrubs or herbaceous patterns occupy portions of the stand. Confusion mainly occurs when these stands are very sparse and patchy in cover, especially on imagery taken during a dry year.
- Very sparse alkaline shrub types – In general, very sparse stands of *Allenrolfea occidentalis* (3721), *Atriplex confertifolia* (5112), *Atriplex lentiformis* (3722), or *Suaeda moquinii* (7411/3725) along the playa margin may be difficult to discern for cover of live vegetation depending on the year and season of the imagery, and on how the shrubs respond to the corresponding climatic conditions.

Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116)

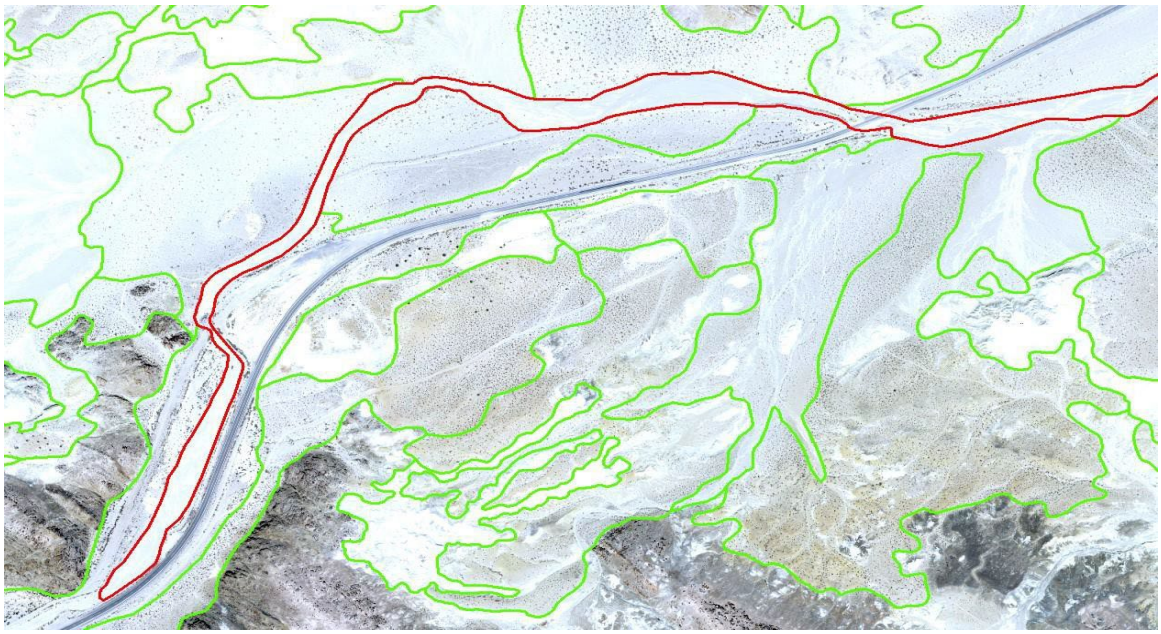


DISTRIBUTION: The Sparsely vegetated playa (Ephemeral annuals) Mapping Unit is found in every region of the DRECP. This type is comprised of larger endorheic basins as well as smaller alkali sink complexes. Playa surfaces are common and vary considerably in size. In the current study area, this mapping unit is mapped all along the western edge of Panamint Valley and covering a large portion of Searles Dry Lake of the Searles Valley subarea. No sites are mapped in the West Mojave Trails A subarea.

Sparsely vegetated playa (Ephemeral annuals) Mapping Unit (6116)



Unvegetated wash and river bottom Mapping Unit (6114)



This aerial view shows the mainly unvegetated sandy portion of the Unvegetated Wash and River Bottom Mapping Unit in Poison Canyon, west of Searles Lake.

This ground photo depicts an unvegetated section of Poison Canyon unvegetated wash in the center view of the scene. Note *Atriplex polycarpa* on the adjacent low terraces on both sides of the wash.

Unvegetated wash and river bottom Mapping Unit (6114)

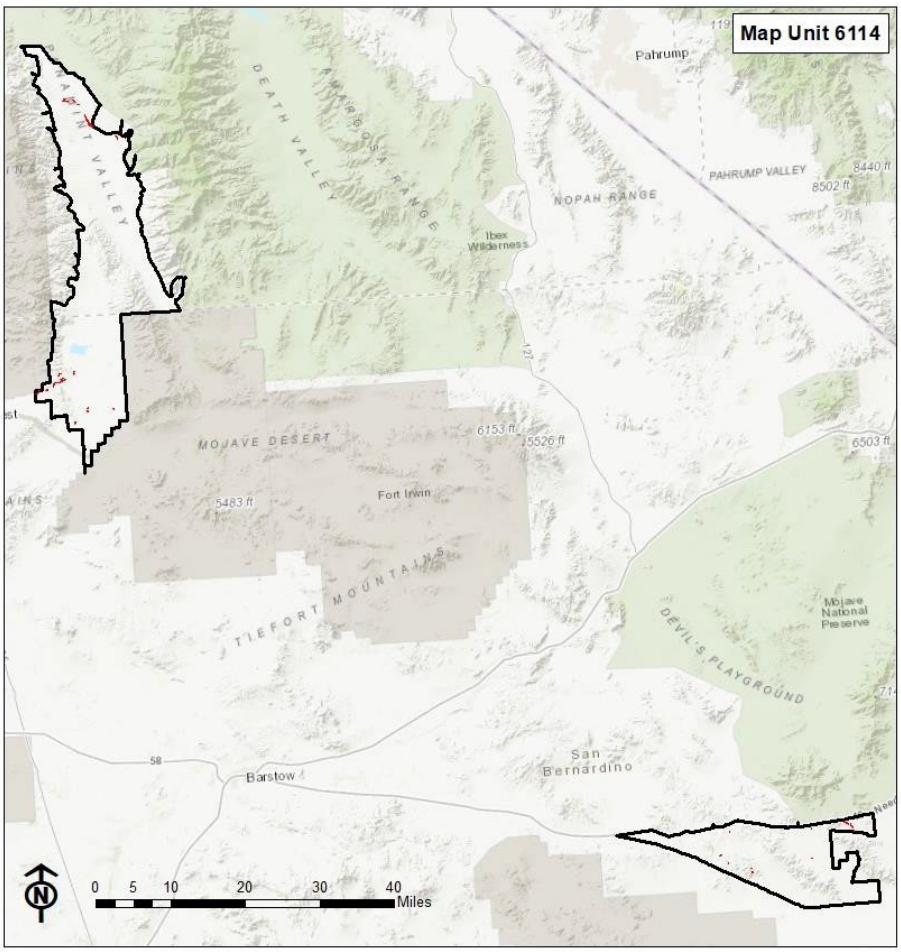
DESCRIPTION: This mapping unit is distinguished by largely unvegetated sands and gravels in the active centers of washes throughout the study area. Recent or frequent flooding generally hinders the development of woody and perennial vegetative growth. Due to varying flooding frequencies and intensities, “river-wash” channels can change rapidly and regularly, alternating from unvegetated to being vegetated by annual natives and then back to unvegetated. Photo interpreters map to this category when scattered shrubs and herbs are inconsistent in the stand and make up less than 2 percent average cover.

PHOTOINTERPRETATION SIGNATURE: Signature variability within unvegetated and sparsely vegetated washes is determined primarily by the intensity and frequency of fluvial events and by the geology of the parent substrate upstream. The signature is light, with the color ranging from white to tan, and increases in lightness and brightness in higher-energy wash systems where fluvial activity is more frequent and intense. Fluvial dynamics within washes fluctuate considerably year to year, resulting in a high temporal variability of vegetative cover. Photo interpreters used the base imagery as for determining vegetative cover. For washes larger than the MMU, every attempt was made to maintain representative connectivity of the drainage by continuing the main stem of the wash even where the channel narrowed considerably below the minimum mapping width. As a rule, smaller braids and rivulets were not grouped together to form a polygon.

TYPES WITH SIMILAR PHOTOINTERPRETATION SIGNATURES:

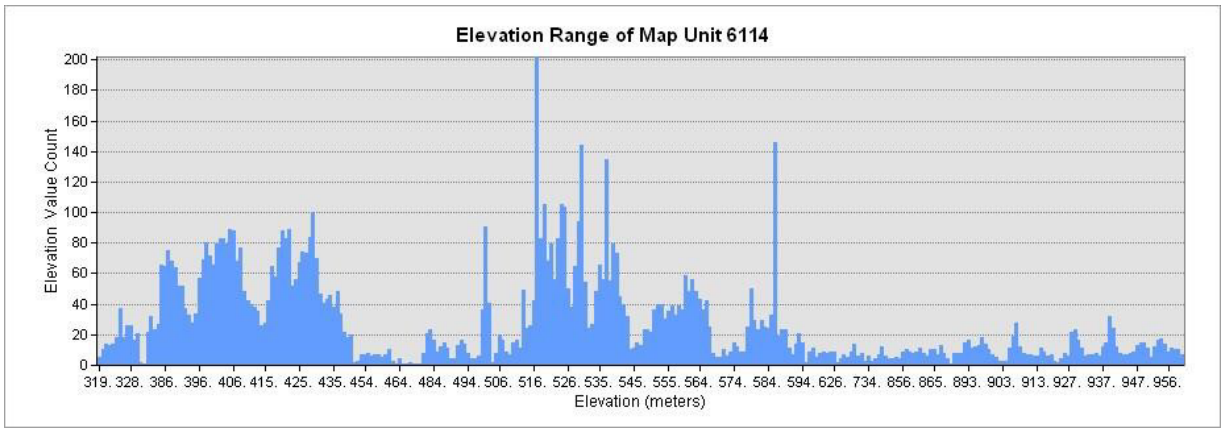
- Low cover wash types: Washes consisting of less than 5 percent cover can frequently be coded to the Unvegetated wash and river bottom Mapping Unit. This is especially true when wash features are dominated by a low cover of light-colored vegetation such as *Psorothamnus spinosus, Bebbia juncea,* or *Hyptis emoryi*. On some image datasets, shadowing of the larger plants can aid in cover estimates of these hard-to-see types.
- Sparsely vegetated playa Mapping Unit (6116): Where wash features broaden into a small basin, portions of the wash tends to pool and evaporate, collecting salts and creating localized scalding. Fluvial activity may pick up further downstream where these small scalds no longer occur. Wash polygons in these settings generally are continued through the scald areas to emphasize connectivity and flow.

Unvegetated wash and river bottom Mapping Unit (6114)



DISTRIBUTION: Mappable features within this type are found scattered throughout the DRECP area, especially at the base of mountains and on upper elevation fans/bajadas. Unvegetated wash and river bottom features are significantly smaller in the Colorado Desert, and are often too narrow to map. In the current study area, this mapping unit is mapped in a number of small drainages at the base of the mountain ranges in both the Searles Valley and West Mojave Trails A subareas.

Unvegetated wash and river bottom Mapping Unit (6114)



Miscellaneous Classes

Built-up & Urban Disturbance (9300) SV WMTA
    Anthropogenic areas of little or no vegetation (9320) SV WMTA
Water (9800)
    Water Impoundment Feature (9805) SV

Built-up & Urban Disturbance (9300)

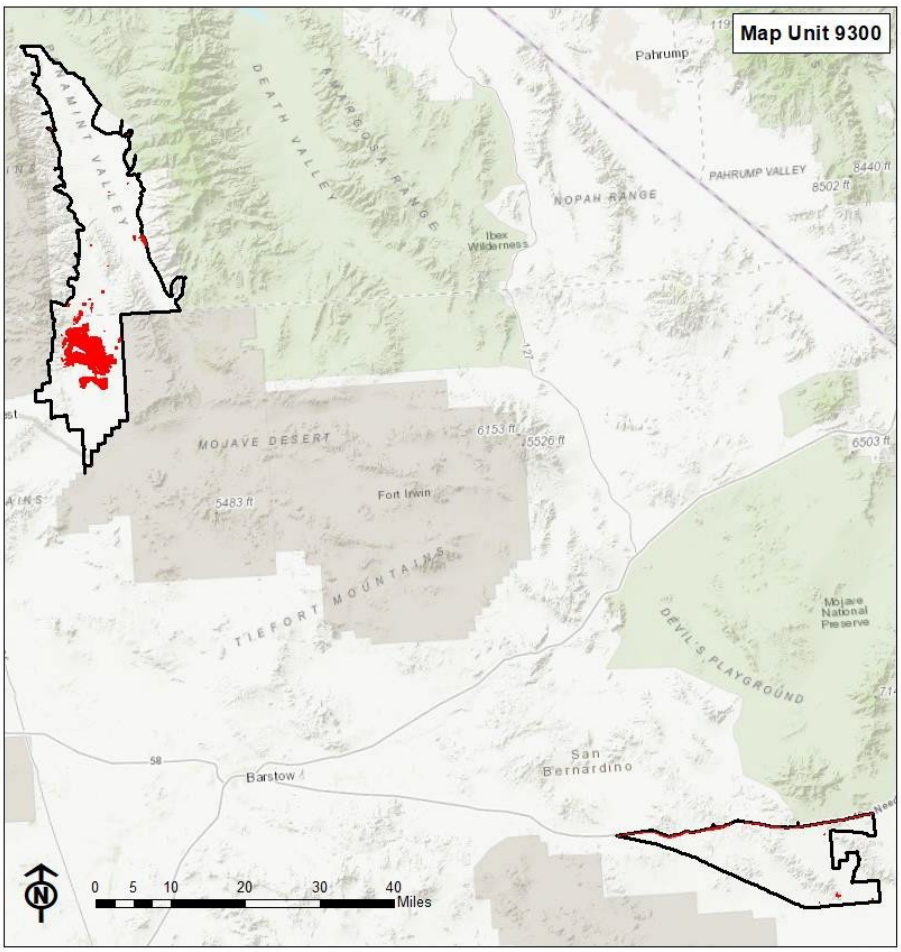
The aerial view above is an example of a built-up area comprising several types of urbanization. To the west (left) of the road is a school; adjacent to the east are several small homes. Along the northeast fringe of the polygon, portions of natural vegetation stands are included in the urban polygon. Photo interpreters often must take minimum mapping unit criteria and ownership (fence line) boundaries into consideration when delineating polygons.

DESCRIPTION: Built-up areas include permanent and semi-permanent structures that are occupied/used or abandoned. Built-up areas can include residential, commercial and services, industrial, and transportation uses, as well as their associated disturbed lands. Areas under construction are also included. Associated impervious surfaces such as parking lots and playgrounds are normally included in the built-up area. Small areas of naturally occurring vegetation may be included in the built-up area following the guidelines of the land use criteria (See Appendix E).

Major four-lane divided highways and freeways are included in this mapping type and are delineated to the fenced right-of-way.

PHOTOINTERPRETATION SIGNATURE: Built-up areas consist of structures and the surrounding associated cleared and/or impervious surface. The boundaries often follow road centerlines and/or fence property lines. Vegetation within the polygon is limited to small naturally occurring components of adjacent stands crossing into the built-up area, and exotic plantings associated with the land use such as lawns, gardens, hedgerows, and trees.

Built-up & Urban Disturbance (9300)



DISTRIBUTION: Built-up areas occur throughout the DRECP, and are most prevalent and extensive in the Antelope, Victor, and Yucca Valleys, centered within the major developments. Concentrated ranchettes, mining, and utility developments occur in the Owens Valley, Tehachapi area, and west Imperial Valley, as well as along the Colorado River. In the current study area, the Built-up Mapping Unit is mapped primarily as the urban development and mining operations on and west of Searles Lake of the Searles Valley subarea. In the West Mojave Trails A subarea, the primary development is the Interstate 40 freeway corridor; with a few scattered sites in the eastern side of the subarea.

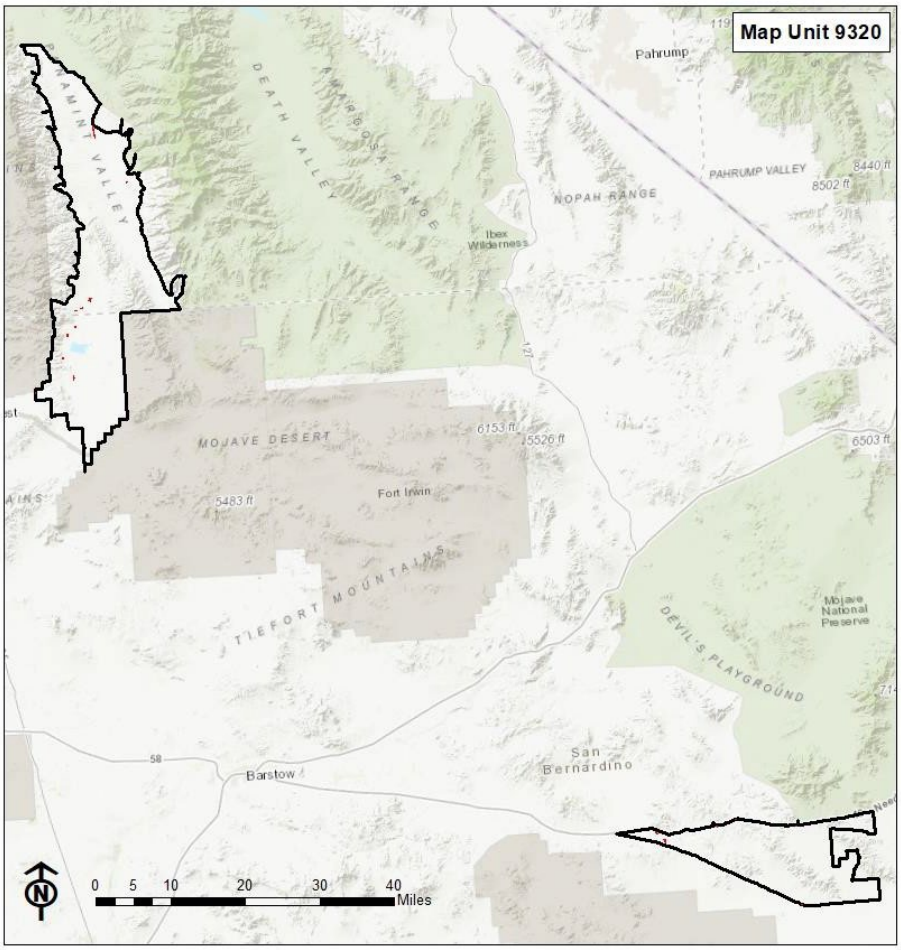
Anthropogenic areas of little or no vegetation (9320)

The above aerial image shows an example of an anthropogenically cleared area adjacent to a housing development.

DESCRIPTION: Anthropogenically cleared areas contain less than 2 percent vegetative cover and have been cleared by human impact. These areas can be temporal in nature and are based on the project base imagery time-frame. Surfaces are generally permeable and can either be covered by fill dirt from another source or contain the original soil and/or substrate layer. Small remnant impervious pavement surfaces can make up a portion of the site. Examples include areas that have recently been cleared for construction, demolition sites, which have most of their impervious surface removed, Off-Highway Vehicle “staging areas” used as rendezvous sites and for camping, and cleared land for military targets.

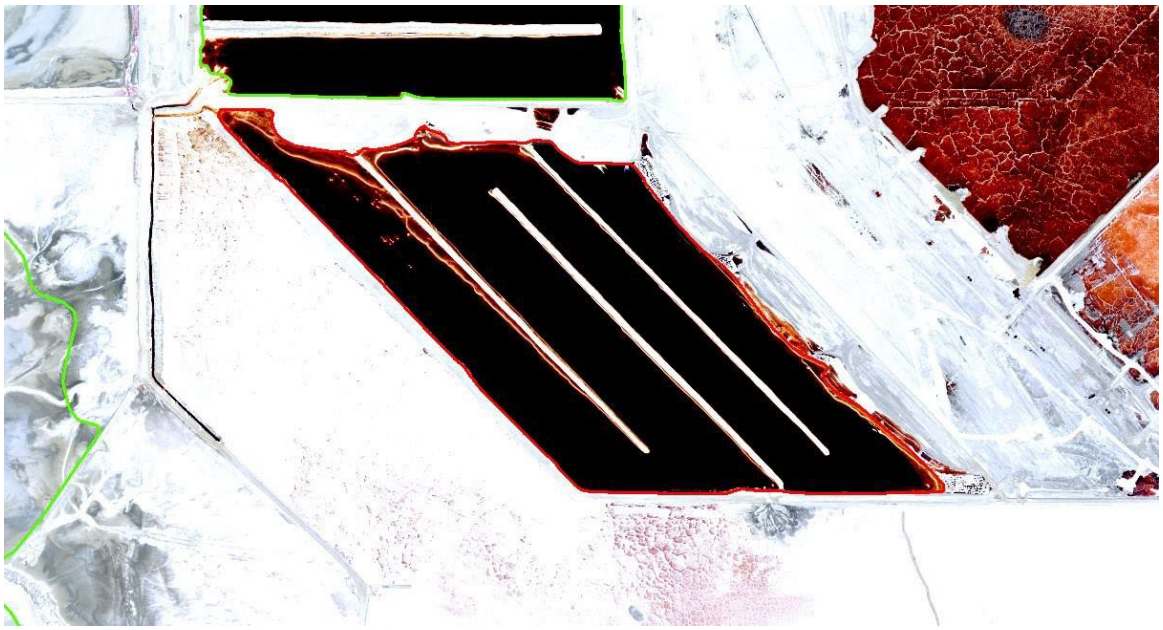
PHOTOINTERPRETATION SIGNATURE: Anthropogenic Areas of Little or No Vegetation appear as cleared land. They normally have a smooth texture and generally reflect the color of the substrate surface formed by its parent material. There is usually a distinct boundary where the vegetation ends and the clearing begins. Cleared edges follow angular or straight lines, which do not normally occur along the boundaries between vegetation types. Anthropogenic areas are difficult to distinguish when adjacent natural vegetation is under 5 percent cover.

Anthropogenic Areas of Little or No Vegetation (9320)



DISTRIBUTION: Anthropogenically cleared areas are consistently scattered throughout the DRECP, especially in more well-developed areas. In the current study area, Anthropogenically Cleared Areas are mapped mostly along the western side of Searles Valley, with a few sites in Panamint Valley, of the Searles Valley subarea. A few sites are mapped in the West Mojave Trails A subarea.

Water Impoundment Feature (9805)

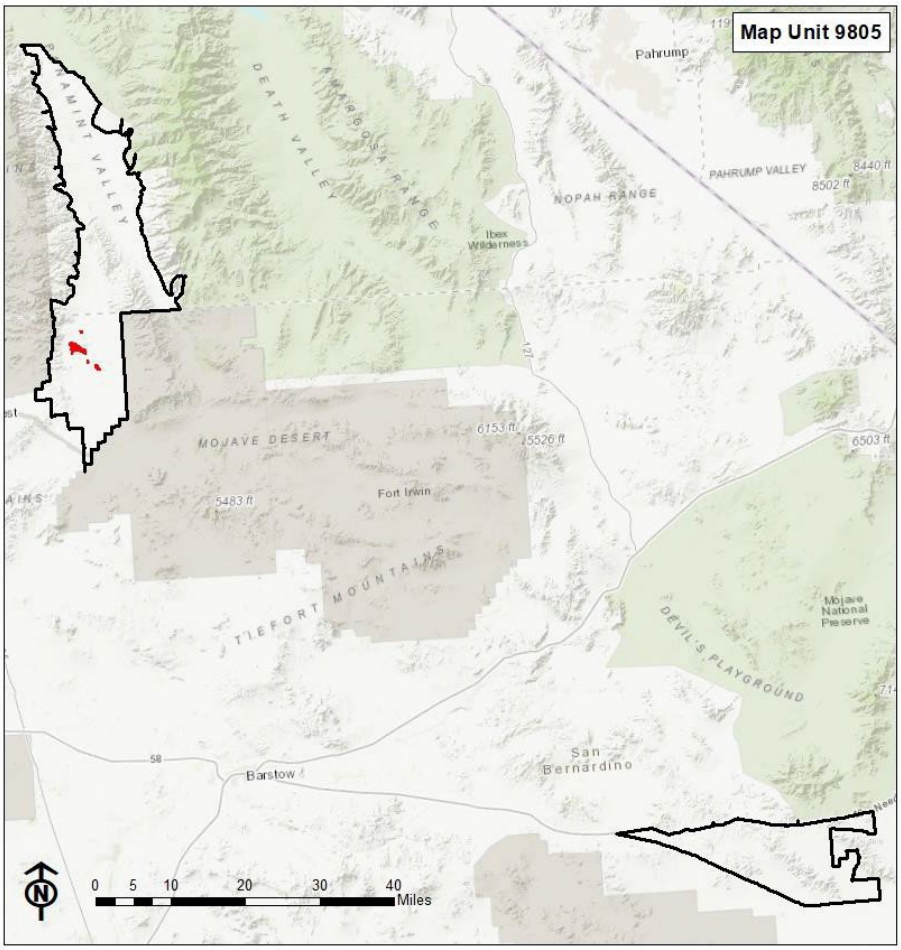


The above aerial image shows a water impoundment feature in the form of a mining evaporative/settling pond on Searles Dry Lake.

DESCRIPTION: This category is composed primarily of straight-edged water bodies impounded by berms and that are at least 2.5 acres in size. Examples include settling ponds, sewage treatment ponds, salt evaporators, duck ponds, and agricultural ponds. Flood control basins are mapped as Water Impoundment Features when they are greater than ten acres in size.

PHOTOINTERPRETATION SIGNATURE: These features are bermed on all sides and may or may not contain water at the time the imagery was flown. Several sets of imagery along with topographic maps were used to help identify some of these features if water was not present at the time the project base imagery was flown.

Water Impoundment Feature (9805)



DISTRIBUTION: Clusters of these water features occur within or near agricultural or developed areas throughout the DRECP, especially in the Western and Central Mojave Desert. In the current study area, this map unit is mapped as a number of ponds (possibly settling ponds, evaporators, or waste ponds) in the mining area on Searles Lake in the Searles Valley subarea. No sites were mapped in the West Mojave Trails A subarea.

APPENDIX C: SUMMARIES OF ACREAGE AND POLYGON COUNT BY MAP UNIT

Three tables are presented on the following pages. The first table lists each of the map units occurring in the final database of the Searles Valley and West Mojave Trails A project, in numerical order by code value. The number of polygons is presented, followed by 4 columns relating to area: the total area covered by the map unit in the study area expressed in hectares; total area in acres; the percent of the total study area mapped as the given map unit; and the map unit's average polygon size in acres. The second table is identical to the first, except the map units are presented in alphabetical order. The third table lists the map units in order by total area from highest to lowest.

Table C-1: Map Unit Acreage, Listed Numerically

Map Unit	Map Unit Description	# of Polygons	Total Area (hectares)	Total Area (acres)	% of Total Area	Average Polygon Size (ac.)
1424	Salix exigua Alliance	2	0.6	1.4	0.0%	0.7
1432	Tamarix spp. Semi-natural Stands	2	1.0	2.4	0.0%	1.2
2305	California annual and perennial grassland (Native component) Mapping Unit	2	9.2	22.6	0.0%	11.3
2330	Mediterranean California naturalized annual and perennial grassland Group	2	24.5	60.6	0.0%	30.3
3410	Arid West freshwater emergent marsh Group	2	1.5	3.6	0.0%	1.8
3721	Allenrolfea occidentalis Alliance	99	2,385.4	5,894.5	1.3%	59.5
3726	Distichlis spicata Alliance	3	2.9	7.2	0.0%	2.4
4110	Lower bajada fan Mojavean-Sonoran desert scrub Group	2	8.8	21.8	0.0%	10.9
4111	Ambrosia dumosa Alliance	90	1,673.3	4,134.9	0.9%	45.9
4113	Atriplex polycarpa Alliance	108	6,838.2	16,897.6	3.9%	156.5
4114	Encelia farinosa Alliance	203	4,836.6	11,951.6	2.7%	58.9
4115	Larrea tridentata – Ambrosia dumosa Alliance	876	80,743.0	199,520.2	45.6%	227.8
4118	Larrea tridentata – Encelia farinosa Alliance	442	18,837.1	46,547.4	10.6%	105.3
4119	Larrea tridentata Alliance	283	14,428.4	35,653.4	8.2%	126.0
4161	Cylindropuntia acanthocarpa / Pleuraphis rigida Alliance	5	27.0	66.8	0.0%	13.4
4211	Ephedra californica – Ephedra trifurca Alliance	23	233.5	576.9	0.1%	25.1
4212	Lepidospartum squamatum Alliance	10	55.0	135.9	0.0%	13.6
4213	Ericameria paniculata Alliance	42	292.8	723.5	0.2%	17.2
4222	Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Alliance	106	165.2	408.2	0.1%	3.9
4226	Acacia greggii – Hyptis emoryi – Justicia californica Alliance	325	1,800.3	4,448.6	1.0%	13.7
5112	Atriplex confertifolia Alliance	67	1,530.5	3,782.0	0.9%	56.4
5419	Ephedra nevadensis – Lycium andersonii – Grayia spinosa Alliance	24	845.1	2,088.4	0.5%	87.0
5424	Yucca schidigera Alliance	1	6.6	16.2	0.0%	16.2
5511	Sarcobatus vermiculatus Alliance	5	47.8	118.1	0.0%	23.6
6110	North American warm desert bedrock cliff and outcrop Group	5	58.7	145.1	0.0%	29.0
6111	Atriplex hymenelytra Alliance	169	6,512.1	16,091.7	3.7%	95.2
6113	Mud Hills sparsely vegetated ephemeral herbs Mapping Unit	95	726.3	1,794.6	0.4%	18.9
6114	Unvegetated wash and river bottom Mapping Unit	30	74.8	184.8	0.0%	6.2

Table C-1: Map Unit Acreage, Listed Numerically

Map Unit	Map Unit Description	# of Polygons	Total Area (hectares)	Total Area (acres)	% of Total Area	Average Polygon Size (ac.)
6116	Sparsely vegetated playa (Ephemeral annuals) Mapping Unit	176	14,515.1	35,867.5	8.2%	203.8
6117	Chorizanthe rigida – Geraea canescens Desert Pavement Sparsely Vegetated Alliance	270	4,158.7	10,276.5	2.4%	38.1
6118	Peucephyllum schottii – Pleurocoronis pluriseta Alliance	16	61.6	152.3	0.0%	9.5
6120	North American warm desert dunes and sand flats Group	1	4.3	10.5	0.0%	10.5
7211	Ambrosia salsola – Bebbia juncea Alliance	181	1,834.1	4,532.3	1.0%	25.0
7222	Chilopsis linearis – Psorothamnus spinosus Alliance	238	770.5	1,904.0	0.4%	8.0
7411	Suaeda moquinii – Isocoma acradenia Alliance	378	4,591.8	11,346.5	2.6%	30.0
9300	Built-up & Urban Disturbance	62	8,150.9	20,141.4	4.6%	324.9
9320	Anthropogenic Areas of Little or No Vegetation	19	91.9	227.1	0.1%	12.0
9805	Water Impoundment Feature	8	532.2	1,315.0	0.3%	164.4
	Totals	**4372**	**176,877.2**	**437,073.1**	**100.0%**	**100.0**

Table C-2: Map Unit Acreage, Listed Alphabetically

Map Unit	Map Unit Description	# of Polygons	Total Area (hectares)	Total Area (acres)	% of Total Area	Average Polygon Size (ac.)
4226	Acacia greggii – Hyptis emoryi – Justicia californica Alliance	325	1,800.3	4,448.6	1.0%	13.7
3721	Allenrolfea occidentalis Alliance	99	2,385.4	5,894.5	1.3%	59.5
4111	Ambrosia dumosa Alliance	90	1,673.3	4,134.9	0.9%	45.9
7211	Ambrosia salsola – Bebbia juncea Alliance	181	1,834.1	4,532.3	1.0%	25.0
9320	Anthropogenic Areas of Little or No Vegetation	19	91.9	227.1	0.1%	12.0
3410	Arid West freshwater emergent marsh Group	2	1.5	3.6	0.0%	1.8
5112	Atriplex confertifolia Alliance	67	1,530.5	3,782.0	0.9%	56.4
6111	Atriplex hymenelytra Alliance	169	6,512.1	16,091.7	3.7%	95.2
4113	Atriplex polycarpa Alliance	108	6,838.2	16,897.6	3.9%	156.5
9300	Built-up & Urban Disturbance	62	8,150.9	20,141.4	4.6%	324.9
2305	California annual and perennial grassland (Native component) Mapping Unit	2	9.2	22.6	0.0%	11.3
7222	Chilopsis linearis – Psorothamnus spinosus Alliance	238	770.5	1,904.0	0.4%	8.0
6117	Chorizanthe rigida – Geraea canescens Desert Pavement Sparsely Vegetated Alliance	270	4,158.7	10,276.5	2.4%	38.1
4161	Cylindropuntia acanthocarpa / Pleuraphis rigida Alliance	5	27.0	66.8	0.0%	13.4
3726	Distichlis spicata Alliance	3	2.9	7.2	0.0%	2.4
4114	Encelia farinosa Alliance	203	4,836.6	11,951.6	2.7%	58.9
4211	Ephedra californica – Ephedra trifurca Alliance	23	233.5	576.9	0.1%	25.1
5419	Ephedra nevadensis – Lycium andersonii – Grayia spinosa Alliance	24	845.1	2,088.4	0.5%	87.0
4213	Ericameria paniculata Alliance	42	292.8	723.5	0.2%	17.2
4115	Larrea tridentata – Ambrosia dumosa Alliance	876	80,743.0	199,520.2	45.6%	227.8
4118	Larrea tridentata – Encelia farinosa Alliance	442	18,837.1	46,547.4	10.6%	105.3
4119	Larrea tridentata Alliance	283	14,428.4	35,653.4	8.2%	126.0
4212	Lepidospartum squamatum Alliance	10	55.0	135.9	0.0%	13.6
4110	Lower bajada fan Mojavean-Sonoran desert scrub Group	2	8.8	21.8	0.0%	10.9

Table C-2: Map Unit Acreage, Listed Alphabetically

Map Unit	Map Unit Description	# of Polygons	Total Area (hectares)	Total Area (acres)	% of Total Area	Average Polygon Size (ac.)
2330	Mediterranean California naturalized annual and perennial grassland Group	2	24.5	60.6	0.0%	30.3
6113	Mud Hills sparsely vegetated ephemeral herbs Mapping Unit	95	726.3	1,794.6	0.4%	18.9
6110	North American warm desert bedrock cliff and outcrop Group	5	58.7	145.1	0.0%	29.0
6120	North American warm desert dunes and sand flats Group	1	4.3	10.5	0.0%	10.5
6118	Peucephyllum schottii – Pleurocoronis pluriseta Alliance	16	61.6	152.3	0.0%	9.5
4222	Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Alliance	106	165.2	408.2	0.1%	3.9
1424	Salix exigua Alliance	2	0.6	1.4	0.0%	0.7
5511	Sarcobatus vermiculatus Alliance	5	47.8	118.1	0.0%	23.6
6116	Sparsely vegetated playa (Ephemeral annuals) Mapping Unit	176	14,515.1	35,867.5	8.2%	203.8
7411	Suaeda moquinii – Isocoma acradenia Alliance	378	4,591.8	11,346.5	2.6%	30.0
1432	Tamarix spp. Semi-natural Stands	2	1.0	2.4	0.0%	1.2
6114	Unvegetated wash and river bottom Mapping Unit	30	74.8	184.8	0.0%	6.2
9805	Water Impoundment Feature	8	532.2	1,315.0	0.3%	164.4
5424	Yucca schidigera Alliance	1	6.6	16.2	0.0%	16.2
	Totals	**4372**	**176,877.2**	**437,073.1**	**100.0%**	**100.0**

Table C-3: Map Units By Total Area

Map Unit	Map Unit Description	# of Polygons	Total Area (hectares)	Total Area (acres)	% of Total Area	Average Polygon Size (ac.)
4115	Larrea tridentata – Ambrosia dumosa Alliance	876	80,743.0	199,520.2	45.6%	227.8
4118	Larrea tridentata – Encelia farinosa Alliance	442	18,837.1	46,547.4	10.6%	105.3
6116	Sparsely vegetated playa (Ephemeral annuals) Mapping Unit	176	14,515.1	35,867.5	8.2%	203.8
4119	Larrea tridentata Alliance	283	14,428.4	35,653.4	8.2%	126.0
9300	Built-up & Urban Disturbance	62	8,150.9	20,141.4	4.6%	324.9
4113	Atriplex polycarpa Alliance	108	6,838.2	16,897.6	3.9%	156.5
6111	Atriplex hymenelytra Alliance	169	6,512.1	16,091.7	3.7%	95.2
4114	Encelia farinosa Alliance	203	4,836.6	11,951.6	2.7%	58.9
7411	Suaeda moquinii – Isocoma acradenia Alliance	378	4,591.8	11,346.5	2.6%	30.0
6117	Chorizanthe rigida – Geraea canescens Desert Pavement Sparsely Vegetated Alliance	270	4,158.7	10,276.5	2.4%	38.1
3721	Allenrolfea occidentalis Alliance	99	2,385.4	5,894.5	1.3%	59.5
7211	Ambrosia salsola – Bebbia juncea Alliance	181	1,834.1	4,532.3	1.0%	25.0
4226	Acacia greggii – Hyptis emoryi – Justicia californica Alliance	325	1,800.3	4,448.6	1.0%	13.7
4111	Ambrosia dumosa Alliance	90	1,673.3	4,134.9	0.9%	45.9
5112	Atriplex confertifolia Alliance	67	1,530.5	3,782.0	0.9%	56.4
5419	Ephedra nevadensis – Lycium andersonii – Grayia spinosa Alliance	24	845.1	2,088.4	0.5%	87.0
7222	Chilopsis linearis – Psorothamnus spinosus Alliance	238	770.5	1,904.0	0.4%	8.0
6113	Mud Hills sparsely vegetated ephemeral herbs Mapping Unit	95	726.3	1,794.6	0.4%	18.9
9805	Water Impoundment Feature	8	532.2	1,315.0	0.3%	164.4
4213	Ericameria paniculata Alliance	42	292.8	723.5	0.2%	17.2
4211	Ephedra californica – Ephedra trifurca Alliance	23	233.5	576.9	0.1%	25.1
4222	Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Alliance	106	165.2	408.2	0.1%	3.9
9320	Anthropogenic Areas of Little or No Vegetation	19	91.9	227.1	0.1%	12.0
6114	Unvegetated wash and river bottom Mapping Unit	30	74.8	184.8	0.0%	6.2
6118	Peucephyllum schottii – Pleurocoronis pluriseta Alliance	16	61.6	152.3	0.0%	9.5
4212	Lepidospartum squamatum Alliance	10	55.0	135.9	0.0%	13.6

Table C-3: Map Units By Total Area

Map Unit	Map Unit Description	# of Polygons	Total Area (hectares)	Total Area (acres)	% of Total Area	Average Polygon Size (ac.)
5511	Sarcobatus vermiculatus Alliance	5	47.8	118.1	0.0%	23.6
4161	Cylindropuntia acanthocarpa / Pleuraphis rigida Alliance	5	27.0	66.8	0.0%	13.4
2330	Mediterranean California naturalized annual and perennial grassland Group	2	24.5	60.6	0.0%	30.3
2305	California annual and perennial grassland (Native component) Mapping Unit	2	9.2	22.6	0.0%	11.3
4110	Lower bajada fan Mojavean-Sonoran desert scrub Group	2	8.8	21.8	0.0%	10.9
5424	Yucca schidigera Alliance	1	6.6	16.2	0.0%	16.2
6120	North American warm desert dunes and sand flats Group	1	4.3	10.5	0.0%	10.5
3726	Distichlis spicata Alliance	3	2.9	7.2	0.0%	2.4
3410	Arid West freshwater emergent marsh Group	2	1.5	3.6	0.0%	1.8
1432	Tamarix spp. Semi-natural Stands	2	1.0	2.4	0.0%	1.2
1424	Salix exigua Alliance	2	0.6	1.4	0.0%	0.7
	Totals	**4372**	**176,877.2**	**437,073.1**	**100.0%**	**100.0**

APPENDIX D

COVER CLASSES

Table D-1: Map Classes for Total Cover by Conifers

Code	Range	Discussion
0	None, Not observable	There are no conifers in this stand.
1	>0-1%	This cover class is rare in the study area. Conifers are widely scattered as emergent. *Juniperus californica and Pinus monophylla* are found in sparse cover on the in the foothills of the San Bernardino Mountains near Highway 247 and adjoins previously mapped areas.
2	>1-5%	This cover class is rare in the study area. Conifers are sparse and unevenly scattered to dispersed and evenly distributed. An area of *Juniperus californica* was mapped on the western edge of the study in the foothills of the San Bernardino Mountains near Highway 247 and adjoins previously mapped areas.
3	>5-15%	This cover class is rare in the study area, only being mapped in a *Pinus monophylla* type. It is located on the western edge of the study area and adjoins previously mapped areas.
4	>15-25%	This cover class was not used in the database.
5	>25-50%	This cover class was not used in the database.
6	>50-75%	This cover class was not used in the database.
7	>75-100%	This cover class was not used in the database.
9	Not applicable/Not assigned	Conifer cover is not applicable when the MapUnit is 9200, 9210, 9220, 9300, 9310, 9800, 9801, 9803, 9804, 9805.

Table D-2: Map Classes for Total Cover by Hardwoods

Code	Range	Discussion
0	None, Not observable	There are no hardwoods in this stand.
1	>0-1%	This cover class is indicative of a sparse cover of hardwoods in stand.
2	>1-5%	A low cover of evenly distributed riparian trees is indicated. This cover is characteristic of stands of *Prosopis glandulosa, Psorothamnus spinosus, Chilopsis linearis, and* washes with *Parkinsonia florida* and *Olneya tesota*.
3	>5-15%	This class is typical of open stands of *Prosopis glandulosa, Psorothamnus spinosus, Parkinsonia florida* and *Olneya tesota* washes and open riparian woodlands with *Populus fremontii*, etc.
4	>15-25%	This class is uncommon in the study area, mostly used with *Prosopis glandulosa* stands and washes dominated by *Parkinsonia florida* and *Olneya tesota*.
5	>25-50%	This class is uncommon in the study area.
6	>50-75%	This is rare in the study area.
7	>75-100%	This cover class is rare in the study area.
9	Not applicable/Not assigned	Hardwood cover is not applicable when the MapUnit is 9200, 9210, 9220, 9300, 9310, 9800, 9801, 9803, 9804, 9805.

Table D-3: Map Classes for Total Cover by Joshua Trees

Code	Range	Discussion
0	None, Not observable	There are no visible *Yucca brevifolia* in the stand, although widely scattered juveniles <3 m tall may be included.
1	>0-1%	This is common in desert shrublands of *Larrea tridentata-Ambrosia dumosa, Coleogyne ramosissima, Yucca schidigera,* etc. *Yucca brevifolia* tree signature may be visible, but individuals are not evenly distributed and are widely dispersed.
2	>1-5%	This class commonly denotes an open, tree-size *Yucca brevifolia* woodland, usually evenly distributed with higher shrub cover.
3	>5%	This density is rare and only found at higher or wetter sites in the Eastern Mojave portion of the study area.
9	Not applicable/Not assigned	Joshua tree cover is not applicable when the MapUnit is 9200, 9210, 9220, 9300, 9310, 9800, 9801, 9803, 9804, 9805.

Table D-4: Map Classes for Total Cover by Trees

Code	Range	Discussion
0	None, Not observable	There are no visible trees (including *Yucca brevifolia*) in the stand, although widely scattered juveniles <3 m tall may be included.
1	>0-1%	Emergent *Yucca brevifolia, Olneya tesota, Parkinsonia florida,* and *Prosopis glandulosa* are examples of this class.
2	>1-5%	Most *Yucca brevifolia* woodlands over a well-developed shrub cover are included. Stands of *Prosopis glandulosa* and desert washes with scattered *Chilopsis linearis, Psorothamnus spinosus,* and *Olneya tesota* with *Parkinsonia florida* are other types commonly found with this cover class.
3	>5-15%	The highest density *Yucca brevifolia* (rarely occurring in the eastern portion of the study area in the Eastern Mojave Desert), open stands of *Prosopis glandulosa,* and well-developed washes containing *Olneya tesota* and *Parkinsonia florida* fall in this class.
4	>15-25%	*Prosopis glandulosa* is the most common example with this cover class.
5	>25-50%	*Prosopis glandulosa* is the most common example with this cover class.
6	>50-75%	This is rare in the study area.
7	>75-100%	This cover class is rare in the study area.
9	Not applicable/Not assigned	Total tree cover is not applicable when the MapUnit is 9200, 9210, 9220, 9300, 9310, 9800, 9801, 9803, 9804, 9805.

Table D-5: Map Classes for Total Cover by Shrub

Code	Range	Discussion
0	None, Not observable	There is no visible perennial shrub signature, such as on extensive cliffs and outcrops, extensive dunes or sand sheets, current agriculture, urban areas, etc.
1	>0-1%	This code value should not be assigned to shrub types. Shrubs are not evenly distributed.
2	>1-5%	Shrubs are widely distributed on harsh substrates, for example *Larrea tridentata-Ambrosia dumosa* or *Encelia farinosa* on steep rocky slopes, or old inactive alluvial surfaces.
3	>5-15%	Upland vegetation (modal *Larrea tridentata-Ambrosia dumosa, Atriplex* spp.) and active vegetated washes (e.g. *Ambrosia salsola*) fall in this range.
4	>15-25%	Well-developed *Coleogyne ramosissima* on moderate rocky slopes, *Isocoma acradenia* in sandy substrates, *Pluchea seric*ea in wet areas, and *Tamarix* are examples with this cover class.
5	>25-50%	This cover class is uncommon in the study area. Examples are high cover stands of *Tamarix,* and *Pluchea sericea,* found in the Salton Sea section of the study area.
6	>50-75%	This cover class is uncommon in the study area. Examples are high cover stands of *Tamarix* and *Pluchea sericea,* found in the Salton Sea section of the study area.
7	>75-100%	This class is rare in the study area.
9	Not applicable/Not assigned	Shrub cover is not applicable when the MapUnit is 9200, 9210, 9220, 9300, 9310, 9800, 9801, 9803, 9804, 9805.

Table D-6: Map Classes for Total Cover by Herbaceous

Code	Range	Discussion
1	0-2%	In general, includes areas with very low rainfall on older alluvial fans and pavement surfaces with impervious substrate, and steep massive bedrock sideslopes.
2	>2-15%	This cover class applies to areas with more rainfall, better soil development, and substrate that is at least somewhat permeable. This is typical of *Coleogyne ramosissima, Yucca schidigera,* and *Atriplex* spp. stands. In addition, dry washes with *Parkinsonia* and *Olneya tesota, Ephedra californica,* or *Chilopsis linearis* are expected to have herb covers in this class.
3	>15-40%	This is rare in the study area.
4	>40%	This is uncommon in this study area. Herbaceous cover in this range is only found in dense wetlands, such as local stands of *Typha, Phragmites australis,* etc.
9	Not applicable/Not assigned	Herbaceous cover is not applicable when the MapUnit is 9200, 9210, 9220, 9300, 9310, 9800, 9801, 9803, 9804, 9805.

APPENDIX E

VEGETATION MISCELLANEOUS CLASSES AND LAND USE MAPPING CRITERIA

Miscellaneous Classes are Vegetation Type (Map Unit) categories reserved for land use types such as agriculture, urban disturbance, and water features, which are attributes of vegetation polygons. A two-tiered coding system (Vegetation Type and Land Use) was used to allow for the coding of a given polygon as both a natural vegetation type and a land use type if the situation warranted it. A polygon that had been assigned a Miscellaneous Class land use code value in the Vegetation Type (Map Unit) Attribute was automatically populated with a corresponding land use code value in the Land Use Attribute.

Minimum Mapping Unit

The minimum mapping unit (MMU) for Miscellaneous Class types 9200, 9210, 9220, 9300, 9320, and 9805 is 2.5 acres. Water types 9800, 9801, 9803, and 9804 have a 1-acre MMU. The minimum size of an Urban Window (9310) polygon is one square mile. Any other specific MMU considerations are given under each map type discussion below. The minimum mapping width (MMW) of a linear-shaped feature is half the width of its appropriate MMU square. These figures served as guidelines rather than strict rules.

Vegetation Type (Map Unit) Attribute:

9000 = MISCELLANEOUS CLASSES

- 9200 = Agriculture
  - 9210 = Woody Agriculture (orchards, vineyards)
  - 9220 = Non-woody Row and Field Agriculture
  - 9230 = Irrigated Pastures
- 9300 = Built-up & Urban Disturbance
  - 9310 = Urban Window
  - 9320 = Anthropogenic Areas of Little or No Vegetation
- 9400 = Restoration
- 9500 = Exotic Trees
  - 9501 = Eucalyptus
- 9701 = Sparsely Vegetated Recent Burned Areas
- 9800 = Water
  - 9801 = Perennial Stream Channel (Open Water)
  - 9803 = Small Earthen-dammed Ponds and Naturally Occurring Lakes
  - 9804 = Major Canals and Aqueducts
  - 9805 = Water Impoundment Feature

9200 = Agriculture
Corresponding Land Use Attribute Code is 2000 or 1436

For this project, agriculture was broken down into three categories: orchards and vineyards (9210), non-woody row and field agriculture (9220), and irrigated pastures (9230). In general, agriculture polygons, such as nurseries, were coded with the generic 9200 code if they were not defined to the 9210 or 9220 subclasses, or were classified as agricultural irrigation channels that met MMU (see below).

Criteria specific to mapping the code 9200 vegetation type is listed below:

a. Nurseries were coded to a vegetation type of Agriculture (9200) with a land use value of Agriculture (2000). This included ambiguous areas where it was unclear if the field was row crop or nursery, and the field was covered with linear patterns of plastic. In these situations, we erred towards calling the polygon nursery.

b. Citrus or orchard removal within 5 years prior to the project base imagery, and appearing as cleared land on the imagery (e.g. Imperial Valley area) were also coded as vegetation type of Agriculture (9200) with a land use value of Agriculture (2000).

c. In the agricultural areas of the Imperial Valley, minor irrigation channels were not considered as water features (9804 = Major Canals and Aqueducts) but rather part of the agricultural practice, therefore the MMW for these minor irrigation channels had to meet the MMW for land use (one-half of a 2.5-acre MMU box or ~150 feet). Usually, these irrigation channels were oriented perpendicular to major canals such as the East Highline Canal or the All American Canal. These small agricultural channels were referred to as “lateral drains” on the USGS topographic map. Often these irrigation channels formed corridors that typically contained one to two small agricultural channels and sometimes included a road and/or a staging area for agricultural practices. These minor irrigation corridors were mapped when they met the MMW of ~150 feet and one of the following criteria:

    - contained two channels
    - contained one channel which appeared to carry water consistently
    - contained one or two channels and a road

The resulting polygon was then coded as vegetation type of 9200 (Agriculture) with a land use value of 1436 (Water Transfer).

Additional criteria related to agriculture areas:

a. Structures associated with agriculture and their adjacent cleared areas were mapped as Built-up & Urban Disturbance (9300) as long as they met the 2.5-acre MMU. Structures or built-up areas not meeting the MMU were combined with their associated agricultural use.

b. Agricultural areas within an urban window (9310) were mapped if they were greater than 10 acres in size.

The criteria that are more specific to the 9210, 9220, and 9230 categories are described in the appropriate sections below.

9210 = Woody Agriculture (orchards, vineyards)
Corresponding Land Use Attribute code is 2200

Woody agriculture (as depicted on the project base imagery) is defined in this study as orchards, vineyards, or jojoba farms. Abandoned orchards remain as 9210 until the trees/shrubs have been removed.

Example 1 – Abandoned Jojoba Plantation
The example above shows a portion of an area west of the small irrigation channel that is an inactive jojoba plantation. Abandoned orchards and vineyards were mapped as Agriculture if the plants were still visible on the imagery. To the east is a citrus grove that is still in production.

Once an orchard/vineyard has been completely removed, the area is mapped as the condition depicted on the base imagery and coded with an appropriate vegetation and/or land use type. If the vegetation was removed and the area was not revegetated, or if it was not evident on the project imagery that the land was taken out of agriculture , then it was coded as vegetation type of Agriculture (9200) with a land use value of Agriculture (2000).

9220 = Non-woody Row and Field Agriculture
Corresponding Land Use Attribute code is 2100

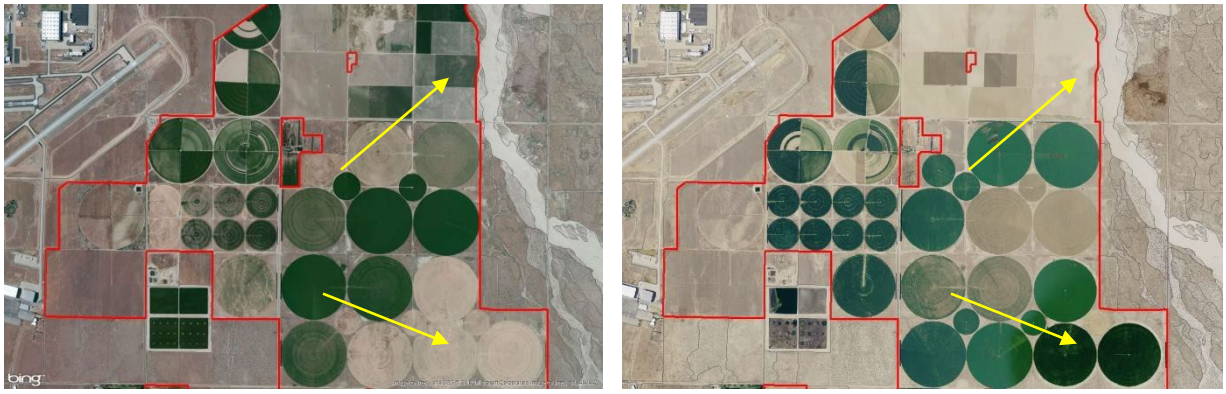
Agriculture in the desert may be difficult to map, especially in areas that have historically been farmed. When mapping an area of agriculture, the question becomes, “when should an area no longer be considered agriculture?” Old plow and irrigation marks on land that has not been cultivated in the past 10 to 20 years or longer may still be visible on the current imagery sources, giving the impression that the area may be agriculture.

To account for the ambiguity of agricultural signatures due to land rotating in and out of agricultural activity, land that had been in crop production at any time within 5 years of the current base imagery is mapped as agriculture for the project. The agriculture polygon boundary was drawn to the largest actively farmed area seen on any of the 5-year set of NAIP imagery. Using the multiple image sets as a guide to code the agricultural areas may have resulted in polygons coded as 9220 that are not photomorphic to the signature on the base imagery. For example, in the 2014-2016 mapping effort, if an area was last actively farmed in 2009, but had been inactive since then, the agriculture polygon extent and attribution was based on the 2009 NAIP image, however, the delineation was based on 2014 image (e.g., following roads, fence lines, etc. that usually appear on all sets of imagery).

The following criteria were set for non-woody Row and Field Agriculture:

a. Land that has been actively farmed within ~5 years was considered agriculture (9220 in the Vegetation Type (Map Unit) Attribute, and 2100 in the Land Use Attribute).
    - If the area in question showed signs of **active** agricultural use (e.g., crop irrigation patterns, or other signs of actively managed crops) on the project base image source, the area was called agriculture (9220).
    - If an area was shown on the project base imagery as fallow, weedy, or abandoned, but earlier sources within the prior 5 years showed active agriculture (crops, plowed dirt, etc.) then the area was still mapped as agriculture.

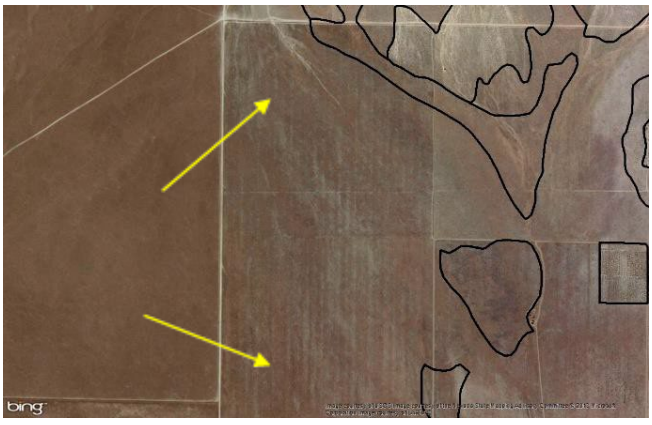
Below is an example of agriculture in different phases.



Example 2 – Annual and Bi-annual Crop Rotation

The above imagery compares a two-year crop cycle. All fallow areas shown on the imagery have been productive at least once within the previous five years. Note the alternating cycles of croplands in and out of rotation.

b. If the area appeared to be **inactive** agriculture (based on the –imagery set going back 5 years from the project imagery) and remained unchanged from image source to image source, then the mapper made the assumption the area was no longer being used for agricultural purposes even though old plow and/or irrigation marks were still visible. Usually the imagery showed a mottled grass or herbaceous signature. Shrubs may have been present in varying amounts and distribution.



Example 3 – Former Agriculture

This example shows former agriculture out of the 5-year timespan returning to natural vegetation. Note the till patterning (eastern 2/3 of the image) that is at least 15 years old.

However, sometimes it was difficult to distinguish an older inactive agricultural field from an active one. Species found in the inactive agriculture fields vary, depending on the location within the study area. The inactive fields usually appeared as a homogeneous, smooth tan grassy signature. These areas were mapped as non-native annual grass (2330) unless the field data noted otherwise. In these situations, an Anthropogenically Altered Disturbance Attribute of 3 was assigned.

c. Cleared and vegetated areas between and at the outer corners of circular pivot-irrigated agricultural fields (crop circles) were evaluated and mapped according to the following criteria:
    - In areas where vegetation (trees, shrubs and grasses) abutted the crop circle, the crop circle was tightly delineated and the vegetation was mapped next to the crop circle if the appropriate MMU was met.
    - The areas between multiple crop circles were often vacant or grassy. If the adjacent area (between or adjacent to crop circles) looked to be cleared or vacant and actively used to aid in the farming operation, then it was coded as part of the 9220 vegetation type.
    - Any buildings with 2.5-acre MMU were coded as the Built-up & Urban Disturbance vegetation type (9300).

9230 = Irrigated Pastures
Corresponding Land Use Attribute code is 2300

This type of agriculture is rangeland pasture that is irrigated during the growing season via ditches and flumes, diverted from small streams, which typically parallel the contours of the land. The annual grassland appears as a green signature, and so are mapped when imagery shows them as actively irrigated. This class is not to be confused with intensive improved pastures which are fenced, with smaller units and associated with agricultural or residential structures (9220 or 9300). They may also be confused with naturally occurring meadows associated with streams, seeps, or springs associated with surface water.

9300 = Built-up & Urban Disturbance
Corresponding Land Use Attribute code is 1000

Built-up & Urban Disturbance represents isolated built-up areas as well as settlements and suburban areas less than 1 square mile in size.

Isolated built-up areas are typically more rural in character, and can range from one isolated homestead to a group of houses on large lots mixed with vacant lots, small agricultural plots, and pods of natural vegetation. Settlements and

suburban areas are larger areas of urban development that are below the 1-square-mile MMU for Urban Window (9310).

There are situations where natural vegetation occurs on the same plot of land as the built-up disturbance. In these settings, it was important to represent the urban disturbance as well as show the continuity of the natural vegetation community by using the two-tiered coding system (Vegetation Type and Land Use Attributes).

- If the natural vegetation met the mapping criteria for an Alliance, the entire area was coded as a natural vegetation type in the Vegetation Map Unit Attribute, and was assigned a Land Use Attribute value of 1000. An example of this is the vegetated campgrounds (Hot Spring Long Term Visitor Area) found in Imperial County.
- If the natural vegetation did not meet the mapping criteria for an Alliance, the entire area was coded as a 9300. This polygon was assigned a Land Use Attribute value of 1000.

The following are mapping considerations for 9300:

a. Photointerpreters were instructed to keep the polygon boundary tight to the land use and associated land use disturbance signature by delineating land use with as little natural vegetation as possible.

b. Natural vegetation that came into the settlement from the outside was continued into the Urban area as a natural vegetation type if the natural area within the Urban area met the 10-acre MMU. When the natural vegetation was riparian, the MMU was lowered to 1 acre to maintain continuity.

c. If a mappable settlement or other developed area polygon (9300) was directly adjacent to an Urban Window (9310) polygon, then the 9300 was incorporated into the 9310.

d. Vacant areas that have “natural” vegetation and are fully contained within a settlement or rural residential area were mapped using the following criteria:
    - A vegetation polygon was created if it was at least 10 acres of contiguous vegetation not split or disrupted by roads or other man-made features. This rule applies to areas that are “more built-up” (settlements) and does not apply to “more natural,” undeveloped areas that are just split by multiple roads.
    - If the vegetated area met the “10-acre contiguous not split by roads” criteria, then other smaller, similarly vegetated areas adjacent to this “main” unit but separated from it by roads were added to the vegetation polygon.

e. Scraped lots and any urban built-up areas that were less than 1 acre and adjacent to urban areas were usually included in the Urban polygon. Context was used for this guideline: for example, scraped areas may not always have been included with the land use, especially if the scrapings were linear along a roadway or fence.

f. Non built-up “holes” within a settlement that are scraped or otherwise disturbed were left as part of the Urban (9300) polygon.

g. An area under construction (including buildings or cleared land with an urban development footprint) was coded as 9300. This includes under-construction areas that were adjacent to existing land uses, such as residential developments, as well as areas that were isolated.

h. If there was a large (at least 2.5 acres) isolated area of disturbance (scraped land) with very little to no development, it was assigned a Vegetation Map Unit code of 9320.

i. On horse-related property, cleared areas were coded as 9300.

j. Flood control basins were included in the code 9300 polygon. However, a basin was mapped separately as a 9805 if it was larger than 10 acres.

k. Major four-lane divided highways and freeways, such as Interstates 8, 15, and 40, were usually delineated to the fenced right-of-way (ROW) as a 9300 polygon. Vegetation within the ROW was normally not mapped. In most cases, the vegetation within the ROW is a disturbance type of vegetation and is different from the natural type of vegetation outside of the ROW.
    - If the ROW fell below the 2.5-acre MMU width (1/2 the width of a 2.5-acre box), that portion of the highway was not mapped unless it was for a very short span, thus keeping the roadway connectivity intact.
    - When the ROW extended beyond 90 feet past the pavement edge, the disturbance corridor was re-evaluated for natural vegetation, and the ROW boundary was not necessarily used as the road/urban boundary. Where possible, the vegetation was kept together in one polygon, and the road and its associated disturbance was captured in a different polygon.

l. Near the Salton Sea, the railroad and California Highway 111 run parallel and were mapped as one polygon coded as “Built-up & Urban Disturbance”. North of the town of Frink where the railroad and Highway 111 complex was mapped, there were man-made berms adjacent to the railroad that were recently scraped. These disturbed berms were included in the 9300 polygon with the railroad and Highway 111. However, south of

Frink, berms paralleling the railroad that were not obviously altered were not included with the “Built Up & Urban Disturbance” polygon, and were therefore mapped to the appropriate vegetation type instead.

m. Surface areas with associated underground mines were mapped as natural vegetation with no land use coding. The Anthropogenically Altered Disturbance Attribute was coded as 1, 2, or 3 depending on surficial disturbance visible on images.

n. Inactive quarries, usually where vegetation has been re-established, were assigned a natural Vegetation Type (Map Unit) code, an Anthropogenically Altered Disturbance Attribute of 1, 2, or 3, and a Land Use Attribute value of 1000.

o. A rural portion of the Mojave Desert near Twentynine Palms contained numerous patchy built-up sections that were under 2.5 acres in size. This region includes built-up areas near the towns of Landers, Sunfair, and in discontinuous locales east to Dale Lake. In these circumstances, the criteria was modified to ensure that the land use was mapped. The specific criteria modifications are listed below:

    - The MMU for active residential was lowered from 2.5 acres to 1.5 acres (i.e. residential areas currently in use).

    - Land use polygons were delineated around active land use including the structures, any exotic plants, and disturbance surrounding the active built-up structures. Photointerpreters excluded as much vegetation from the land use polygon as possible.

9310 = Urban Window
Corresponding Land Use Attribute Code is 1000

Contiguous areas of built-up and disturbed lands greater than 1 square mile in size are considered an Urban Window.

Urban Windows were mapped using the following criteria:

a. If an urban area was smaller than 1 square mile, it was mapped as a code 9300.

b. Urban/disturbed polygons (9300) next to an Urban Window were not mapped separately, but were incorporated into the Urban Window.

c. If an area was within or adjacent to the Urban Window and under construction at the time of the imagery (including buildings or

cleared land with an urban development footprint), it was coded as part of the 9310.

d. Only agricultural areas greater than 10 acres were mapped separately within an Urban Window. However, agricultural areas along the edge of an Urban Window were mapped adhering to the 2.5-acre MMU rule.

e. Natural vegetation was not mapped in an Urban Window unless it met the following criteria:
    - Vacant areas within an Urban Window that were “natural” vegetation were assigned a natural vegetation type if they were at least 10 acres of contiguous area and not split or disrupted by roads or other man-made features. However, adjacent, smaller, similarly vegetated areas were added to the “main” unit even if separated by roads.
    - Natural vegetation that came into the settlement from the outside was continued into the Urban Window area as a natural vegetation type if the natural area met the 10 acre MMU and MMW criteria. When the natural vegetation was riparian, the MMU was lowered to 1 acre to maintain continuity.

f. Flood control basins were included in the code 9310 polygon but were mapped separately as a 9805 if they were larger than 10 acres.

9320 = Anthropogenic Areas of Little or No Vegetation
Corresponding Land Use Attribute Code is 0000

Isolated scrapes that were larger than 2.5 acres with no apparent built-up uses associated with them were mapped as 9320 with an Anthropogenically Altered Disturbance Attribute code of 3.

Intensely used OHV areas, where the vegetation may have been sparse due to high vehicle traffic, were not considered a 9320. Such areas were assigned an appropriate Vegetation Type code and a Roadedness Disturbance Attribute value of 2 or 3. However, cleared or scraped OHV staging areas used for camping or rendezvous were considered 9320. For these situations, a Roadedness Disturbance Attribute value of 3 and an Anthropogenically Altered Disturbance Attribute value of 9 were assigned.

Situations in which scraped land was not coded as 9320 include the following:

a. Isolated scraped land and urban built-up areas less than 2.5 acres were ignored. These visible patterns, when less than 2.5 acres, were treated within the vegetation polygon by using the Anthropogenically Altered Disturbance or the Development Disturbance Attribute codes (both of which had scales ranging from 0 to 3).

b. When scraped land abutted an urban polygon (9300 or 9310) and was greater than 2.5 acres, it was mapped as part of the 9300/ 9310 polygon.

c. When scraped land abutted an urban polygon (9300 or 9310) and was less than 2.5 acres, it was left to the mapper's discretion about how it was mapped.

9400 = Restoration
Corresponding Land Use Attribute Code is 3500

When an area has signs of restoration (rows, obvious planting, etc.), and there is less than 2% vegetation present, then the site is coded as Restoration, with an associated land use code of 3500 (Vacant Land – Restoration).

A number of native revegetation efforts are noted in the DRECP area, especially in the Owens Valley and along the Colorado River. These sites may contain any combination of species, with a varying arrangement and distribution, and not necessarily following the natural landscape. The "unnatural" patterning of the plants, as well as the past history of the site on the imagery, give clues to the area as under restoration. Where species are discernible on the imagery with greater than 2% cover of vegetation, the site may be assigned to an Alliance, Group, or Macrogroup type (if possible) rather than the Restoration map class, but still be given a Land Use class of 3500 = Vacant Land – Restoration.

9500 = Exotic Trees
Corresponding Land Use Attribute Code is 0000

The non-native tree plantings that are mapped under this class are usually associated with former human habitation sites and disturbed areas near the Colorado River as well as near the East Highline Canal. These trees meet the appropriate MMU and are not mapped as part of a 9300 or 9310 polygon. These are considered "hortomorphic" as opposed to "agromorphic" classes in the National Vegetation Classification. The MMU for upland exotic trees is 10 acres and the MMU for wetland exotic trees is 1 acre. (Note: The aggressive non-tree exotics that have their own map unit are *Arundo donax* (1431), *Tamarix* spp. (1432), and Mediterranean naturalized annuals (2330)).

9701= Sparsely Vegetated Recently Burned Areas
Corresponding Land Use Attribute Code is 0000

Areas that have burned so severely in a fairly recent fire (less than three years), where there is no or very little discernable vegetation recovery. Recovery may be very sparse and difficult to photo interpret. Prior vegetation, if assessed from other imagery, can be noted in the Notes field.

9800 = Water
Corresponding Land Use Attribute Code is 9800

The Water map unit includes open water bodies, either natural or artificially created, that may or may not contain water at the time of the project base imagery. For this project, water was further broken down into four categories: perennial stream channels (9801), small earthen-dammed and naturally occurring lakes (9803), major canals and aqueducts (9804), and water impoundment features (9805). The more generalized 9800 code was also applied to artificial perennial water bodies containing water supplied from sources other than the watershed upslope from the mapped feature.

The following are considerations for mapping polygons that were coded as 9800 in this project:

- Artificial water bodies were mapped as 9800. Examples include:
    - Park ponds
    - Recreational lakes within a residential development
    - Reservoirs
    - Curvilinear-shaped duck ponds with water
    - Bermed agricultural ponds with water
- The MMU was 1 acre. However, in an Urban Window (9310) the MMU was 10 acres.
- The water body contained perennial water.
- All the available imagery and topographic references were reviewed.
- The high water line served as the boundary.
- Water in a playa was mapped as part of the playa (Vegetation Type Attribute code = 6116)

9801 = Perennial Stream Channel (Open Water)
Corresponding Land Use Attribute Code is 9800

This type is includes the Colorado River where water flows throughout most average rainfall years. This type has an MMU of 1 acre and an MMW of half the width of a 1-acre square.

9803 = Small Earthen-dammed Ponds and Naturally Occurring Lakes
Corresponding Land Use Attribute Code is 9800

This class includes perennial or seasonally flooded water bodies, either occurring naturally in the landscape or impounded by earthen dams, which receive their water completely from the upstream watershed. They have an MMU of 1acre.

The following are considerations for mapping polygons that were coded as 9803:

- The MMU was 1 acre.
- Small dammed ponds on creeks contain ephemeral water from natural seasonal flow.
- Some dammed ponds are found on drainages in the San Gabriel Mountain foothills.
- Bermed ponds in agricultural fields are not included.

These may include naturally ponded water in the Mojave River and Colorado River floodplain.

9804 = Major Canals and Aqueducts
Corresponding Land Use Attribute Code is 1436

Aqueducts and major canals are coded separately because of their unique characteristics as a water conveyance system. Only open water aqueducts and major canals that meet the 1-acre MMU are mapped. The Colorado Aqueduct, East Highline Canal, Westside Main Canal, All American Canal, Coachella Canal, California Aqueduct, and the Owens Valley portion of the Los Angeles Aqueduct are mapped as this type.

9805 = Water Impoundment Feature
Corresponding Land Use Attribute Code is 9810

These are typically utility or other straight-edged water bodies impounded by berms and may or may not contain water at time of imagery exposure. The MMU is 2.5 acres. Examples are settling ponds, sewage treatment ponds, salt evaporators, non-curvilinear duck ponds (with and without water), curvilinear duck ponds (without water) and bermed agricultural ponds (without water).

Water impoundment features were coded with a Development Disturbance Attribute code of 3 and Anthropogenically Altered Disturbance Attribute code of 3.

The following criteria are provided to give additional clarification for specific situations regarding Water Impoundment Features:

- **Flood Control Basins** – are not mapped as a 9805 unless they are greater than 10 acres in size. Flood control basins less than 10 acres in size are mapped as part of a 9300 or 9310 polygon.

- **Duck Ponds** – In situations where there is a mix of duck ponds (curvilinear, non-curvilinear, with and/or without water) that are determined to be in current use, these were, as a whole, mapped as 9805, and not separated into individual 9800 and 9805 polygons. Inactive duck pond areas with shrubs growing in them are mapped as natural vegetation.

Land Use Attribute:

The land use types are taken from the Southern California Land Use Consortium/ Southern California Association of Government's Land Use Classification developed by AIS (Johnson and Reyes, 1990), which was based on the Anderson, et al. (1972) land use classification system.

Land Use

0000 = Not Assigned/Not Assessed
1000 = Urban
1436 = Water Transfer (major canals, aqueducts and agricultural channels)
1850 = Wildlife Preserves & Sanctuaries
2000 = Agriculture (includes nurseries)
2100 = Non-woody Row & Field Crops
2200 = Orchards & Vineyards
2300 = Improved Pastureland (Irrigated)
3500 = Vacant Land - Restoration
9800 = Undifferentiated Water
9810 = Water Impoundment Feature

0000 = Not Assigned/Not Assessed
Corresponding Vegetation Type is variable

This value is assigned to areas that are not evaluated for land use.

1000 = Urban
Corresponding Vegetation Type is variable

The Level I Urban or Built-up Land category is characterized by intensive land use where the landscape has been altered by human activities. Although structures are usually present, this category is not restricted to traditional urban areas. Urban or Built-up Land Level II categories include Residential; Commercial and Service; Industrial; Transportation, Communication and Utilities; Industrial and Commercial Complexes; Mixed Urban or Built-up; Other Urban or

Built-up and Recreational. Included with each of the above land uses are associated lands, buildings, parking lots, access roads, and other appurtenances, unless these are specifically excluded. Utility features such as settling ponds, sewage treatment ponds, and salt evaporators were mapped as Water Impoundment Feature (9810). Channelized portions of unvegetated maintained stream courses (MapUnit = 6114) and improved flood channels are also included in the Urban class.

1436 = Water Transfer (major canals, aqueducts and agricultural channels)
Corresponding Vegetation Type Code is 9200 and 9804

This Level IV category typically includes major aboveground water distribution channels, aqueducts, water treatment, filtration (non-sewage), reclamation (non-sewage), and pumping facilities. However, for the DRECP mapping project, only aboveground open water transfer conveyance features were mapped as this class. Other facilities, such as treatment, reclamation, and pumping facilities, were mapped as the general Level I Urban category (1000).

Examples of water transfer conveyance features are the California and Colorado River Aqueducts for domestic water; and the Coachella, All American, and East Highline Canals for agricultural irrigation water. These appear on the aerial photos as linear, open water, concrete lined or unlined canals. Also included are small irrigation channels/ditches if they met the mapping MMU/MMW criteria. This category does not include improved flood channels and structures which are included in the Urban category (1000) or Water Impoundment Feature (9810).

1850 = Wildlife Preserves & Sanctuaries
Corresponding Vegetation Type is variable

This Level III category typically includes public and private facilities, and developed areas devoted to the preservation of wildlife species and habitats. For the DRECP mapping project only non-built-up undeveloped public and privately-owned managed wetland areas were mapped as this class. Areas within wildlife refuges that do not appear to be actively managed are not coded as this type.

2000 = Agriculture (includes nurseries)
Corresponding Vegetation Type code is 9200

This Level I category typically includes all lands used primarily for the production of food and fiber, poultry, and livestock, as well as structures associated with these activities. For the DRECP project, Agriculture was broken down into three more specific categories: Non-woody Row and Field Agriculture (2100), Orchards and Vineyards (2200), and Improved Pastureland (Irrigated) (2300). In general, agriculture uses, such as nurseries, were coded with the generic Level I Agriculture (2000) category if they were not defined to the 2100 or 2200 subclasses. Citrus or orchard removal within 5 years prior to the project base

imagery, and appearing as cleared land on the imagery (e.g. Imperial Valley area), were also coded as the Level I Agriculture category.

2100 = Non-woody Row & Field crops
Corresponding Vegetation Type code is 9220

This Level II category was used with areas of Non-woody Row and Field Agriculture.

Included here are active field and row cropland areas and improved pasture lands. The croplands include cultivated, in-crop, harvested, fallow or temporarily idle land. The improved pasture land may be in pasture year-around or may be in the cropland seasonal rotation. Improved pasture land does not include rangeland.

2200 = Orchards & Vineyards
Corresponding Vegetation Type code is 9210

This Level II category includes commercially productive tree, bush, and vine crops.

Orchards include fruit and nut trees, and bush crops. Nut and other fruit trees are similar; however, the color will be a lighter shade of green. The trees are aligned in a matrix form, with crowns abutting each other. Bush crops are similar to orchards; however, they may be configured in rows rather than a matrix, and are much shorter in height. The photo signature for vineyards will appear as dark green, coarse-textured, thin linear rows that, when measured, will be approximately five to ten feet apart. The height of vineyards is shorter than orchards. The orchard and vineyard areas will be neat and uniform.

Orchards in the study area are typically citrus, fruit, and nut crops. Bush crops tend to be jojoba. Vine crops are rare.

2300 = Improved Pastureland (Irrigated)
Corresponding Vegetation Type code is 9230

This Level II class is composed of rangeland that is irrigated by artificial means such as by flumes and ditches. Signature shows green color of grassland in growing season. Polygons would otherwise have been considered vacant land and assigned to the default Land Use Class of Not Assigned. More intensely improved and maintained fenced pastures and corrals associated with residential, commercial, or agricultural structures are considered Urban or Agriculture and would be classed as Land Use = 1000 or 2100, as appropriate.

3500= Vacant Land – Restoration
Corresponding Vegetation Type code is 9400

A number of native revegetation efforts are noted in the DRECP area, especially in the Owens Valley and along the Colorado River. These sites may contain any combination of species, with a varying arrangement and distribution, and not necessarily following the natural landscape. The “unnatural” patterning of the plants, as well as the past history of the site on the imagery, give clues to the area as under restoration.

Where species are discernible on the imagery with greater than 2% cover of vegetation, the site may be assigned to an Alliance, Group, or Macrogroup type rather than the Restoration vegetation map class, but still be given a Land Use class of 3500 = Vacant Land – Restoration. Where restoration is not obvious, such as some planted *Populus fremontii* stands in the Picacho subarea, the Land Use may be coded as 0000 (Not Assigned).

When an area has signs of restoration (rows, obvious planting, etc.), and there is less than 2% vegetation present, then the site is coded as Restoration, with an associated land use code of 3500 (Vacant Land – Restoration).

9800 = Undifferentiated Water
Corresponding Vegetation Type codes are 9800, 9801, 9803

The Level I Undifferentiated Water category typically includes open water bodies, either natural or artificially created, that may or may not contain water at the time of the project base imagery. For this project, perennial stream channels and small earthen-dammed and naturally occurring lakes are included. Major canals and aqueducts are mapped as Water Transfer (1436); water impoundment features (settling ponds, sewage treatment ponds, salt evaporators, non-curvilinear duck ponds that may or may not contain water, curvilinear duck ponds without water, and bermed agricultural ponds without water) are mapped as Water Impoundment Feature (9810).

9810 = Water Impoundment Feature
Corresponding Vegetation Type codes are primarily 9805

The Level II Water Impoundment Features are typically utility or other straight-edged water bodies impounded by berms and may or may not contain water at time of imagery exposure. The MMU is 2.5 acres. Examples are settling ponds, sewage treatment ponds, salt evaporators, non-curvilinear duck ponds (with and without water), curvilinear duck ponds (without water) and bermed agricultural ponds (without water).

APPENDIX F - FIELD FORMS FOR VEGETATION SAMPLING AND ACCURACY ASSESSMENT

CNPS RECON FIELD FORM (March 6, 2019, with slope/aspect)

Recorder: **Other Surveyors:** **Date:** **Return?** ☐

Waypoint ID:

GPS Name _____ **Projected? No / Yes / Base / Digitized**

If Yes, enter: **Bearing (°):** _____ **Distance (m):** _____ **Inclination (°):** _____

UID:

If Yes or Digitized, enter: **Base Waypoint ID**: _____

Location Name:

Base / Projected (circle one) Record either UTMs or Decimal Degrees GPS error: **ft./ m./ PDOP** _____

UTMs: UTME ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___ ___

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

Stand Size: <1 1–5 >5 **Camera:** **Photos:** **View Radius** _____

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

Field Alliance name:

Comments:

% Cover: Conifer Hardwood Total Tree Regen Tree Shrub Herb Total Veg Exotics (L,M,H)

Strata	Species	% cover	Strata	Species	% cover	Strata	Species	% cover

Recorder: **Other Surveyors:** **Date:** **Return?** ☐

Waypoint ID:

GPS Name _____ **Projected? No / Yes / Base / Digitized**

If Yes, enter: **Bearing (°):** _____ **Distance (m):** _____ **Inclination (°):** _____

UID:

If Yes or Digitized, enter: **Base Waypoint ID**: _____

Location Name:

Base / Projected (circle one) Record either UTMs or Decimal Degrees GPS error: **ft./ m./ PDOP** _____

UTMs: UTME ___ ___ ___ ___ ___ ___ **UTMN** ___ ___ ___ ___ ___ ___ ___

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

Stand Size: <1 1–5 >5 **Camera:** **Photos:** **View Radius** _____

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

Field Alliance name:

Comments:

% Cover: Conifer Hardwood Total Tree Regen Tree Shrub Herb Total Veg Exotics (L,M,H)

Strata	Species	% cover	Strata	Species	% cover	Strata	Species	% cover

Field Verification Form: DRECP Vegetation Mapping (11/01/18)

Surveyors (circle recorder):	**Date:**
Location name:	
Base Waypoint ID:	**GPSname:** **Projected?** Yes /No /Base **Error:**+/- m
Polygon UID:	**Bearing:** ___ **(degrees)** **Distance:** _____**(meters)** **Inclination:** **(degrees)**
	LAT _ _ _ _ _ _ _ _ _ LONG- _ _ _ _ _ _ _ _ _

Strata	Species	%cover	(:	trata	Species	%cover C

Notes: (including# and type of roads, recommendations for line-work revision, state of veg. "discernibility" based on season and topography, classification interpretation, homogeneity and unusual sightings of plants or animals)	
Map Unit Name	
Secondary/ Tertiary Map Unit	
Camera Name / Photos	
Conifer Cover	None >0-1% >1-5% >5-15% >15-25% >25-50% >50-75% >75-100% NA
Hardwood Cover	None >0-1% >1-5% >5-15% >15-25% >25-50% >50-75% >75-100% NA
Joshua Tree Cover	None >0-1% >1-5% >5-15% >15-25% >25-50% >50-75% >75-100% NA
Total Tree Cover	None >0-1% >1-5% >5-15% >15-25% >25-50% >50-75% >75-100% NA
Shrub Cover	None >0-1% >1-5% >5-15% >15-25% >25-50% >50-75% >75-100% NA
Herb Cover	0-2% >2-15% >15-40% >40% NA
Exotics	None or not visible 1 2 3 Not Applicable
Roadedness	None or not visible 1 2 3 Not Applicable
Development	None or not visible 1 2 3 Not Applicable
Anthropogenic Alteration	None or not visible 1 2 3 Not Applicable
Hydrologic Modification	NO YES Not Applicable
Percent of delineated polygon viewed	rough% of **polygon** viewed
Is this a "multiple" point assessment?	NO YES if yes: of points for this polygon
If 'multiple point', what is est. % of **stand** viewed?	What is the estimated% of the delineated poly occupied by stand?

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APPENDIX G - FIELD KEY TO VEGETATION TYPES

Hierarchical Field and Mapping Key to California Desert Vegetation Map in Support of the Desert Renewable Energy Conservation Plan
***revised* December 4, 2020**

This key is developed for the areas mapped in support of the DRECP. It is intended for use as a guide to identification of field-based and image interpretation- based vegetation assessments.

Due to the high diversity of the vegetation communities in the area, this is a complex key. You will need to collect or refer to plant composition data that include not only those species that are dominant but also those "indicator," or characteristic species, whose presence may cause the plot to key to another vegetation type. If you are using this key for mapping rules please also note that some of the types are typically below the accurate detectability for mapping in this project.

Terms and Concepts Used throughout the Key

Stand: The basic physical unit of plant communities in a landscape. It has no set size. Some vegetation stands are very small, such as certain wetland types, and some may be several square kilometers in size, such as certain forest types. A stand is defined by two main unifying characteristics:

1. It has compositional integrity. Throughout the stand, the combination of species is similar. The stand is differentiated from adjacent stands by a discernible boundary that may be abrupt or occur indistinctly along an ecological gradient.

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

The structural and compositional features of a stand are often combined into a term called homogeneity. For an area of vegetated ground to meet the requirements of a stand, it must be homogeneous at the scale being considered. The map has a variable Minimum Mapping Unit (MMU) size. For fine scale features such as wetlands, riparian, or playas it is 1 acre and for upland vegetation it is 10 acres. Certain types of upland vegetation are also found in washes (*i.e., Ambrosia salsola* and *Atriplex polycarpa* alliances). In these cases, vegetation is mapped at a MMU of 5 acres in order to maintain the wash vegetation features separate from surrounding upland. Special types are mapped to 1 acre. The foothills of the Transverse Ranges are mapped to 2 acres in keeping with state-wide mapping standards.

Alliance: Plant communities based on dominant/diagnostic species of uppermost or

dominant stratum. Part of the National Vegetation Classification System (NVCS) hierarchy.

Association: The most botanically detailed plant community designation based on dominant species and multiple co- or subdominant indicator species from any strata. Part of the NVCS hierarchy.

Plant community nomenclature: Species separated by "-" are within the same stratum; species separated by "/" are in different strata. The number that precedes some plant community names is the Mapping Code used for labeling plant community polygons for the associated GIS-based plant community map.

Cover: The primary metric used to quantify the importance/abundance of a particular species or a particular vegetation layer within a stand. It is measured by estimating the aerial extent of the living plants, or the bird's-eye view looking from above, for each category. Cover in this mapping project uses the concept of "porosity" or foliar cover rather than "opacity" or crown cover. Thus, field crews and aerial photo interpreters are trained to estimate the amount of shade produced by the canopy of a plant or a stratum by taking into account the amount of shade it casts excluding the openings it may have in the interstitial spaces (*e.g.*, between leaves or branches). This is assumed to provide a more realistic estimate of the actual amount of shade cast by the individual or stratum which, in turn, relates to the actual amount of light available to individual species or strata beneath it. However, as a result cover estimates can vary substantially between leaf-on versus leaf-off conditions.

If there is a species present in high cover for which no type exists in the key, there are two options. First, the plot can key to another species that is present in high cover. For example, a plot with 6 percent cover *Senna armata* and 4 percent *Ambrosia salsola* would key to *Ambrosia salsola*, since there is no *Senna armata* type defined in the study area. If this is not a reasonable option, the plot can be designated "unable to key." Plots that are unable to key may be candidates for new vegetation types especially if similar stands are seen to repeat in the landscape. In addition to *Senna armata,* several other woody species may dominate a stand but may not be keyable here, including: *Tetradymia* spp. (including *T. stenolepis* and *T. fasciculatus*), *Lepidium fremontii*, and *Fraxinus velutina.* Comments are inserted in the likely places in the key to address not as yet formally designated vegetation types, which may be dominated by such species.

Absolute cover: The actual percentage of the surface area of the plot that is covered by a species or physiognomic group (trees, shrubs, herbaceous), as in "creosote bush covers 10 percent of the plot." Absolute cover of all species or physiognomic groups, when added together, may total greater than 100 percent, because this is not a proportional number and plants can overlap each other. For example, a plot could have 25 percent tree cover, 40 percent shrub cover, and 50 percent herbaceous cover.

Relative cover: The percentage of the surface area of the plot that is covered by one species or physiognomic group (trees, shrubs, herbaceous) as compared or relative to the amount of surface of the plot covered by all species or groups. Thus, 50 percent

relative cover means that half of the total proportion of cover of all species or physiognomic groups is composed of the single species or group in question. Relative cover values are a proportional number that, when added together, total 100 percent for each sample or stand. For example, a creosote bush–burro bush vegetation plot with 5 percent cover creosote bush and 5 percent cover burro bush estimated using absolute cover would translate to 50 percent relative cover of creosote bush and 50 percent relative cover of burro bush.

Dominance: Dominance refers to the preponderance of vegetation cover in a stand of uniform composition and site history. It may refer to cover of an individual species as in "dominated by creosote bush," or it may refer to dominance by a physiognomic group, as in "dominated by shrubs." When we use the term in the key a species is dominant if it is in at least 70 percent of the stands of this type, with at least 50 percent relative cover in each stand, however, see "dominance by layer," below.

> **Strongly dominant: 60 percent or more relative cover.** A species in the dominant life form stratum has 60 percent or greater relative cover.
>
> **Codominant: Each species has 30 percent–60 percent relative cover.** Codominance refers to two or more species in a stand with near equal cover. In general, codominance can occur among species that have between 30 and 60 percent relative cover each. **To be codominant species** should be in at least 70 percent of the stands of this type, with at least 30 percent relative cover in each stand. For example in a desert scrub stand with 5% *Larrea tridentata*, 3% *Ambrosia dumosa*, and 4% *Ephedra nevadensis* (total 13% shrub cover), technically only the *Larrea* (5/13 = 39% relative cover) and the *Ephedra* (4/13 = 31% relative cover) would be codominant, even though the stand would key out to *Larrea tridentata – Ambrosia dumosa* alliance (see rules for *Larrea tridentata – Ambrosia dumosa* in key below.).
>
> **Consistent/Characteristic/Diagnostic species:** Should be present in at least 75 percent of the stands of the type, with no restriction on cover.
>
> **Abundant species:** Should be present in at least 50 percent of the samples, with an average of at least 30 percent relative cover in all samples.
>
> **Dominance by layer:** Tree, shrub, and herbaceous layers are considered physiognomically distinct. A vegetation type is considered to belong to a certain physiognomic group if it is dominated by one layer. Layers are prioritized in order of height. The tallest layer, if it meets a criterion in the "characterized" definitions (see below) is said to dominate, and the type is usually named at the alliance level by the characteristic species of the tallest layer. Average covers within the dominant layer reflect the "modal" concept of the characteristics of a particular vegetation type. For example, a higher average cover of woody plants within a stand not recently affected by disturbance reflects a mode of general availability of water, nutrition, and equitable climate, while lower average cover under similar conditions would reflect lower availability of these things.

Layer dominance concepts are relative to higher levels in the classification that are driven by regional climate (usually from Macrogroup to Formation levels). This is an important concept in the mapping area where, for example, desert shrublands meet California Mediterranean climate shrublands or montane woodlands. Rules within the Mojave-Sonoran desert discuss *Yucca brevifolia* having a threshold membership rule of >1% cover with even distribution, even when *Y. brevifolia* occurs over a much more dense and evenly distributed sclerophyllous shrub cover of *Adenostoma fasciculatum* or *Quercus john-tuckeri.* This rule does not apply in a more Mediterranean Californian climate where such a stand would key to the best characteristic species of the shrub layer (e.g., *Adenostoma fasciculatum)*. In order to be keyed to a *Y. brevifolia* alliance, such a stand would have to contain at least 10% cover of *Y. brevifolia* over the sclerophyll layer, since for wetter non-desert environments the rule for tree layer dominance is ≥ 10% tree cover. This also applies to situations where *Pinus monophylla* occurs over chaparral as in portions of the foothills of the Transverse Ranges, since *P. monophylla* alliance is diagnostic of the Intermountain Singleleaf Pinyon - Western Juniper Woodland Macrogroup. Although *P. monophylla* may only need to be >1% cover in desert vegetation, it would need to be >10% when present in predominantly sclerophyllous Mediterranean scrub, which regularly has >25% shrub cover in a stand.

Plant Dispersion (sociability) in semi deserts and sparsely vegetated landscapes: For all desert vegetation, an even distribution of species in the dominant layer is an important factor in correctly identifying alliances and associations. Whatever the dominant overstory layer, the diagnostic species in that layer should be evenly distributed across the stand being assessed. This applies to riparian stands characterized by willows, cottonwoods, and palms; desert scrub with species such as creosote bush, saltbush, or encelia; or herb-land/grassland stands with species such as *Coreopsis, Amsinckia, Eriogonum, Pleuraphis,* or *Bromus*. Therefore, when using this key in the field or with high resolution aerial imagery, it is important to assess not just the estimated cover of the diagnostic species in their layer(s), but also reflect upon their dispersion within the stand.

Relatively even spacing throughout the stand is important particularly in vegetation with low total cover since an even distribution of the diagnostic species is a much better indicator than overall cover, as this may only vary a few percent between diagnostic and associated species. Irregular distribution of species suggests a history of recent disturbance and makes precise determination more difficult. In some cases due to disturbance such as recent fire or clearing, desert vegetation may not be identifiable to alliance and can only be described at higher levels such as group or macrogroup. In other cases early seral vegetation also has diagnostic opportunistic species such as *Ambrosia salsola, Ericameria cooperi, E. nauseosa, or Encelia actoni.* They may quickly colonize and form stands that will begin, if left undisturbed for several years, to shift to a more stable and structurally diverse stand of a different alliance. The key is arranged in the general order of the NVCS hierarchy for situations like this; it reflects such ecological relationships.

Increaser: A plant species (usually shrubs as used in this key) that tends to increase in

numbers and in relative cover following fire, prolonged grazing, or other disturbance.

Estimating cover using actual percentages, rather than cover classes, is preferable, because it gives the fullest picture of the vegetation present. It enables later review of the data to confirm the choice of plant community and may help to describe new vegetation types and answer future management or research questions. If a less rigorous and faster approach is needed, for example, if the project is not primarily a vegetation project, the following cover classes may be used:

1. <1 percent, 2. 1–5 percent, 3a. 6–15 percent, 3b. 16–25 percent, 4. 26–50 percent
5. 51–75 percent, 6. 76–100 percent

All references to percent cover in the key are to absolute cover unless specified in a particular section as relative cover.

Diagnostic species: A species typically found in the dominant stratum of a vegetation type often lending its name to that association or alliance due to its constancy and reliable presence throughout most similar stands.

Sparse: Used to describe individual layers of vegetation (tree, shrub, herb, or subdivisions of them) where the cover is typically less than 2 percent absolute cover.

Sparse vegetation: Neither vascular plants nor nonvascular organisms provide a consistent structural component or play an important role in ecological processes on the site. For the desert this is usually below 2% absolute cover in combination with an irregular uneven distribution across the landscape.

Woody plant: Is any species of plant that has noticeably woody stems. It does not include herbaceous species with woody underground portions such as tubers, roots, or rhizomes.

Tree: A one-stemmed woody plant that normally grows to be greater than 5 meters tall. In some cases, trees may be multiple stemmed following ramifying after fire or other disturbance, but the size of mature plants is typically greater than 5 meters. Undisturbed individuals of these species are usually single stemmed. Certain species that resemble shrubs most of the time in our study area but may be trees in other areas (*e.g.*, *Juniperus californica*) are, out of state-wide tradition, called trees, even though conversely tall shrubs such as *Quercus john-tuckeri* may be equally as tall, but are never called trees. It behooves one to memorize which species are “traditionally” placed in one life-form or another. We use the NRCS Plants Database to do this.

Tree-characterized vegetation: Trees are evenly distributed throughout the stand. In the Mediterranean climate margins of the desert, as in the San Gabriel, San Bernardino, Sierra Pelona, Liebre, or Tehachapi Mountains, trees have typically $\geq$10 percent cover, providing a consistent structural component. In the true desert, short trees such as pinyon pine, Joshua tree, or California juniper are diagnostic at lower than 10% cover. Typically 2 or even 1 percent, of evenly distributed diagnostic tree species is all that is needed, if one or both of the following criteria are met: (1) trees influence the

distribution or population dynamics of other plant species; (2) trees play an important role in ecological processes within the stand.

Forest: In the NVCS, a forest is defined as a tree-dominated stand of vegetation with 60 percent or greater cover of trees. Most forest alliances tend to have average tree cover of 60 percent, but individual stands under certain conditions may drop lower than 60 percent.

Woodland: In the NVCS, woodland is defined as a tree-dominated stand of vegetation with between 25 percent and 60 percent cover of trees. The same notion of "modality" that applies to forest types also applies here and to the sparsely wooded category.

Emergent: A plant (or vegetation layer) is considered emergent if it has a low cover and rises above a layer with has most of the cover in the stand. For example, individual *Quercus lobata* trees may comprise an emergent tree layer of 5 percent over a dense layer of *Artemisia californica* shrubs; the stand would be considered within the *Artemisia californica* Shrubland Alliance because the total tree cover is < 10% and the shrub cover is >10%. Further, medium to tall shrubs are not considered emergent over shorter shrubs, but short trees are considered emergent over tall shrubs. For desert vegetation, which is inherently sparse, the threshold is lower. Trees such as pinyon pine, California juniper, and Joshua tree can be evenly distributed at as low as 1-2% and instead be considered the dominant members of the canopy because the shrub or herb vegetation cover is usually low. An emergent tree in the desert is generally not evenly distributed.

Joshua Tree and "Microphyll" "woodland". *Yucca brevifolia* is iconic and typically substantially taller than most other woody plants of the Mojave Desert. It is considered a tree even in its short clonal form, which is typical of the western desert margins. Even though woodlands outside of the desert are rarely considered such when the tree cover is less than 10%, a stand can be considered Joshua tree woodland when Joshua trees are evenly distributed and have at least 1% cover.

Colorado Desert microphyll woodland species such as *Olneya tesota*, *Parkinsonia florida,* and *Psorothamnus spinosus* even at their best "woodland" development, are rarely over 10% cover throughout a stand though they are visually and structurally conspicuous. They define stands, even with lower than 5% absolute cover, especially since any other component woody species typically have less cover than these trees. Additionally, these plants generally occur in washes with other wash woodland species such as *Chilopsis linearis*.

Shrub: Usually a multi-stemmed woody plant that is between 0.2 meter and 5 meters tall. Definitions are blurred at the low and high ends of the height scales. At the tall end, shrubs may approach trees based on disturbance frequencies (*e.g.*, old-growth resprouting chaparral species such as *Cercocarpus montanus, Fremontodendron californica, Prunus ilicifolia,* and so forth, may frequently attain "tree size"). At the short end, woody perennial herbs or subshrubs of various species are often difficult to

categorize into a consistent life-form.

Sub-shrub: A multi-stemmed plant with noticeably woody stems, typically less than 0.5 meters tall and sometimes confusable with a seemingly woody perennial herb.

Shrub-characterized vegetation: Shrubs (including sub-shrubs) are evenly distributed throughout the stand, providing a consistent (even if sparse) structural component, the stand cannot be characterized as a tree stand, and one or both of the following criteria are met: (1) shrubs influence the distribution or population dynamics of other plant species; (2) shrubs play an important role in ecological processes within the stand.

Herbaceous plant: Any species of plant that has no main woody stem development and includes grasses, forbs, and perennial species that die back each year.

Herb-characterized vegetation: Herbs are evenly distributed throughout the stand, providing a consistent (even if sparse) structural component, and play an important role in ecological processes within the stand, and the stand cannot be characterized as a tree or shrub stand.

Nonvascular vegetation: Nonvascular organisms provide a consistent (even if sparse) structural component and play an important role in ecological processes within the stand.

Botanical nomenclature: We use the NRCS PLANTS database in vegetation mapping as our standard for botanical names.

Use of the Key

This key is constructed in a traditional dichotomous style, with couplets of opposing choices. Exceptions are in the most diverse groups where dichotomies split the main subdivisions of alliances and then a small number of associations may be simply listed below the subdivisions with diagnostic characteristics. The key is blind to any artificial division between trees, shrub, and herbaceous dominated vegetation.
Instead it follows more closely the new National Vegetation Classification hierarchy (Faber-Langendoen et al. 2009) promoted by the Ecological Society of America's Vegetation Panel and the Federal Geographic Data Committee (Peet 2008).

To underscore the relationships of different vegetation in the Western Mojave, bolded text (in addition to Alliance and mapping unit names) has been inserted to show hierarchical position at important ecological breaking points given in the key. Aside from the main concepts of **Alliance** and **Association** previously mentioned above, the other hierarchy units are (from highest to lowest) are: **1. Class, 2. Subclass, 3. Formation, 4. Division, 5. Macrogroup, and 6. Group.**

The vegetation map includes some mapping units that are either human created or are not vegetation at all. These may be individuated from the natural vegetation below by using this short key, below.

KEY TO NATURAL AND ANTHROPOGENIC LAND COVER

1. Landscape unit consists of water bodies 9800 = Water

2. Open waters of naturally flowing streams and rivers…
9801 = Perennial Stream Channel (Open Water)

2'. Water either naturally contained and not flowing, or contained by anthropogenic means (canals, reservoirs or aqueducts)

3. Water contained by earthen dams and/or natural landscape features…
9803 = Small Earthen-dammed Ponds and Naturally Occurring Lakes

3'. Water contained entirely by pavement, concrete, or by human constructed earthen walls…

4. Water in conveyance, including the California Aqueduct and other canals or aqueducts…
9804 = Major Canals and Aqueducts (Open Water)

4'. Water surrounded on all sides by human-constructed walls…
9805 = Water Impoundment Feature

1.' Landscape is not water…

5. Landscape is heavily modified by human activity. This constitutes such things as recently planted agricultural crops, broad extents of residential and industrial buildings, and areas that have been physically denuded of vegetation. In the vegetation mapping classification these are generically termed Miscellaneous Map Classes (the "9000" codes). In the National Vegetation Classification System these would include in part the classes called Hortomorphic (gardens and other plantings for aesthetic purposes) and Agromorphic (all forms of agriculture including annual row crops, vineyards, orchards, and timber plantations)…

6. Landscape is vegetated by human-plantings for aesthetic purposes, food, fiber, or building materials production…

7. Vegetation is confined to active agriculture or active restoration sites (defined as planted and maintained for no more than 5 years earlier than the 2010 NAIP base imagery date). May be dominated by annual or perennial types…
9200 = Agriculture (within the current 5-year cycle) (includes nurseries)

8. Vegetation defined by woody vegetation such as orchards and vineyards.
9210 = Woody Agriculture (orchards, vineyards)

8'. Vegetation defined by annual and perennial herbaceous vegetation, including the following.
9220 = Non-woody Row and Field Agriculture 9230 = Irrigated Pastures 9400 = Restoration Sites

7’. Vegetation confined to aesthetic horticultural plantings of trees not grown for harvest for food or other products…
9500 = Exotic Trees

9. Vegetation consisting of planted trees of the genus *Eucalyptus*…
9501 = Eucalyptus (not mapped and not inventoried in study area)

9’. Vegetation consisting of planted trees of other species… (unit not defined for this project)

6’. Landscape is unvegetated or consists of a matrix of development and small patches of natural or human planted vegetation…
9300 = Built-up & Urban Disturbance

10. Landscape unit is not vegetated but cleared by humans…
9320 = Anthropogenic areas of little or no vegetation

10’. Landscape is defined by a minimum of 1 square mile area, containing a matrix of buildings and small natural or anthropogenic vegetated or unvegetated opening between buildings. Commonly called suburban areas or housing developments…
9310 = Urban Window

5’. Landscape is sparsely to very well-vegetated with naturally growing (not planted and heavily tended) vegetation …
Use key to natural and semi-natural vegetation, below.

KEY TO NATURAL AND SEMI-NATURAL VEGETATION

1. Vegetation largely absent and no species are evenly distributed. Vegetation not uniformly distributed across a landscape surface, generally less than 5% cover, not composed of evenly-spaced trees or shrubs, or not characterized by herbaceous species most of the time. Following seasons of exceptional precipitation, herbaceous annual species may be abundant and evenly distributed...
Class 6 Lithomorphic Vegetation (Nonvascular and Sparse Vascular Rock Vegetation) Subclass 6.C Semi-Desert Nonvascular and Sparse Vascular Vegetation
Formation 6.C.1 Warm Semi-Desert Cliff, Scree, and Rock Vegetation
Division 6.C.1.a North American Warm Semi-Desert Cliff, Scree, and Rock Vegetation
6100 = North American Warm Semi-Desert Cliff, Scree, and Other Rock Vegetation Macrogroup MG117

2. Landscape characterized by open dunes, dune aprons, or sand flats. Vegetation is generally sparse to very open (<2-10% cover) except for annual blooms in favorable years. May include the following possible alliances, although local indicator species may be different including various annual herbs (*e.g.*, *Cryptantha angustifolia, Camissonia claviformis, Cleome* or *Cleomella* spp., *Chorizanthe rigida, Dicoria canescens, Psathyrotes annua,* and *Oenothera deltoides*) or early seral shrubs or perennials (e.g., *Petalonyx* spp., *Croton californicus, Hesperocallis undulata, Rumex*

hymenosepalus)…

6120 = North American Warm Desert Dunes and Sand Flats Group

Dicoria canescens or *Abronia villosa* are often characteristically present in stands, but are not necessarily dominant or even present, depending upon the year and the phenology of these annual plants. Skeletons of *Dicoria, Oenothera deltoides, Abronia villosa, Cleome* or *Cleomella* spp. and other psammophytic annuals are usually present. Uniform woody plant cover is typically <2% absolute cover and may include *Larrea tridentata, Parkinsonia florida* and *Psorothamnus emoryi.* However, other sand-loving shrubs, such as *Petalonyx thurberi* or *Eriogonum deserticola*, may be present and dominant and/or variable in cover…

6121 = *Dicoria canescens - Abronia villosa - Panicum urvilleanum* (Desert dunes) Alliance

Three associations are noted below:

Stands characterized by even, sparse distribution of the stoloniferous dune panic-grass (*Panicum urvilleanum*). Restricted locally to broad sandy riverbed and adjacent low dunes of the Mojave River from Hinkley to Camp Cady…

6122 = *Panicum urvilleanum* (Desert panic grass patches) Association

Stands dominated by the tall perennial herb *Wislizenia refracta,* which may have as low as 1% cover. Found associated with low dunes adjacent to Palen Dry Lake, often adjacent to open stands of *Atriplex canescens* or *Suaeda moquinii)* scrubland…

6123 = *Wislizenia refracta* (Spectacle fruit) Association

Stands characterized by evenly distributed *Salsola tragus* with other annual plants and sparse (<2 %) shrub cover along dunes and sand flats...

6124 = (*Dicoria canescens*) – *Salsola tragus* ((Twinbugs) - Prickly Russian thistle) Association

2’. Landscape characterized by desert pavement, pediment, badlands, playa margins, or outcrops with ≤5 % cover of perennial plant species, none of which are particularly evenly distributed. During exceptional years there may be significant annual ephemeral species cover (which may be evenly distributed). Species are not always present, but on non-sand substrate can include *Plantago ovata, Cryptantha angustifolia, Chorizanthe rigida,* and *Geraea canescens,* etc...

6110 = North American warm desert bedrock cliff and outcrop Group

3. Stands are characterized by very low shrub cover, and are low in total absolute cover (usually 1-5%) of all layers…

4. *Atriplex hymenelytra* usually with >1% cover or no other woody species with equal or higher cover except *Larrea tridentata* or *Ambrosia dumosa,* which may sometime be co- dominant. Often occurs on hot rocky slopes, dry bajadas, alkaline badlands and playa edges. Stands are localized such as near Ridgecrest and Trona on alkali basin sediments and are more extensive in the Calico Mountains and Alvord Mountains on volcanic ash and flows emanating from the southern and eastern sides of these ranges. Stands also occur on volcanic hills southeast of Barstow and west of Daggett, and in various other areas including the eastern Owens Valley and along the western Inyo Mountains. Stands are often considered "sparsely vegetated"; however, some stands can have up to 10% shrub cover under certain circumstances. *Larrea tridentata* often intermixes. Stands co-dominated by *Atriplex confertifolia* are in *Atriplex confertifolia* alliance…
6111 = *Atriplex hymenelytra* (Desert holly scrub) Alliance

4'. Vegetation dominated or characterized by a low total cover of *Ephedra funerea* or *Peucephyllum schottii,* with no other indicator shrub species present in greater cover or dispersion…

5. Stands typical of rocky calcareous rocks (or ultramafic igneous rocks) in localized areas mid-elevations of the study area. *Ephedra funerea, Amphipappus fremontii* or *Salvia funerea* present and diagnostic to codominant or dominant…

6. An uncommon alliance found in calcareous rocky sites, or rarely on dioritic (though nutrient poor) rocky slopes. Often accompanied by *Encelia farinosa, Eriogonum fasciculatum, Echinocactus polycephalus, Ferocactus cylindraceus, Larrea tridentata,* or other shrubs at scarce cover. Surveys include those in the West Mojave Trails National Monument and in Death Valley on limestone parent material…
5444 = *Amphipappus fremontii - Salvia funerea* (Fremont's chaffbush - woolly sage scrub) Alliance

6'. Another uncommon alliance also found in calcareous rocky sites, or rarely, other shallow volcanic slopes in the study area. Often accompanied by *Echinocactus, Ferocactus,* or *Echinocereus* spp. Some surveys have been taken for this alliance in the northern and eastern portion of our study area…
6112 = *Ephedra funerea* (Death Valley joint fir scrub) Alliance (not mapped and not inventoried in study area)

5'. Stands typical of steep massive outcrops of basalt or calcareous rocks (cliffs and scree) at lower elevations across the study area. The bright

green arborescent shrub *Peucephyllum schottii* (which resembles *Larrea* at a distance, beware), *Eucnide urens,* and/or *Pleurocoronis pluriseta* is characteristic in the stand, but is often only 1-5% total cover…
6118 = *Peucephyllum schottii - Pleurocoronis pluriseta* (Desert fir - Bush Arrowleaf) Alliance

3.' Stands usually do not support a sparse, even distribution of shrubs. Cover is either apparently lacking entirely, or in good precipitation years, distinguished by ephemeral blooms of annual plants. Substrates vary from hills, mountains, playas and riverbeds…

7. The substrate is low-lying with little topography; either desert playa or wash and river bed channels of sand, cobbles, silt, clay, or salty or alkaline mineral deposits…

8. This mapping unit is distinguished by largely unvegetated sands and gravels in the active centers of washes throughout the study area. Depending upon site history and recent flooding events these bare "river-wash" channels can change rapidly and regularly from unvegetated to vegetated by annual natives, to vegetated by shrub species indicative of washes of different flooding frequencies and intensities. Mapped usually as scattered shrubs and herbs with <2% average cover and uneven distribution...
6114 = Unvegetated wash and river bottom Mapping Unit

8'. This mapping unit defines silty, clay, or salt crust playa (dry lake) surfaces throughout the study area. Most of the time playas, whether salty, silty, or clay, are usually <2% vegetative cover. However, annuals such as *Monolepis nuttalliana, Atriplex elegans, A. phyllostegia, Chenopodium* spp., and others may occur in good El Niño years in relatively high cover. These are still mapped as this unit. Characteristics include flat or cracked substrate and no obvious slope. Reflectance may be gray to white to light brown...
6116 = Sparsely vegetated playa (Ephemeral annuals) Mapping Unit

7'. The substrate is part of an elevated landscape that usually has hills, slopes, outcrops, or ravines…

9. Stands in recently burn areas where vegetation is scant and difficult to discern due to
<2% shrub and herb cover…
9700 = Burn Areas including 9701 = Sparsely vegetated recently burned areas

9.' Stands are not in burn areas…

10. Stands usually are gradually sloping, but often characterized by small cobbles or rock fragments - the result of long-term weathering of alluvial fans/bajadas and lava flows at the bases of mountains. Settings are

often very sparsely vegetated with few widely scattered shrubs (except in small rills and washes). Herbs are abundantly present following significant rainfall events. Diagnostic herbs, such as *Chorizanthe rigida, C. brevicornu, Geraea canescens*, *Aliciella latifolia, Nama pusillum,* and *Phacelia rotundifolia,* persist as dead skeletons for many months helping in proper identification, yet herbaceous skeletons are often lacking especially on harsh substrates. In the eastern deserts, as near the Colorado River, surfaces are very dark with "desert varnish" due to age of exposure. Younger surfaces to the west, with slightly higher average precipitation, have more regular annual residual vegetation. In the western Mojave, some stands have annuals regularly present, including non-natives such as *Bromus rubens* and *Schismus* spp. Currently the entire suite of "desert pavements" across warm California deserts are considered members of this alliance… **6117 = *Chorizanthe rigida - Geraea canescens* (Spiny herb-Desert gold) Desert Pavement Sparsely Vegetated Alliance**

10'. Stands defined by (usually) steeply to moderately sloping landforms that can be considered hills, badlands, mountains, or outcrops of resistant rock. Vegetation is sparse or at best characterized by sporadic occurrences of ephemeral blooms of annuals following good rainfall…

11. This typically sparsely vegetated type is often with <2% shrub cover or herb cover. Substrate is composed of unconsolidated and uncemented fine, sometimes alkaline, sediments. Strata variations make for different but typically sparsely vegetated slopes. Averaging all cover across these landscapes is usually what constitutes >10-acre mapping polygons, which consist of a matrix of small patches of shrubs or herbs at 2% interspersed with larger areas of little or no measurable cover of herbs or shrubs. Topography is often rugged and eroded ("badlands"), however, in some areas, such in the northern portion of the study area, the same species may occur on relatively flat terrain adjacent to edges of playas and in broad valleys. Some have scattered *Atriplex hymenelytra, A. confertifolia, Stanleya pinnata* and other woody species. In El Niño years, clay slopes are heavily covered with annual *Eriogonum* species, probably most commonly *E. inflatum* (many sizes of this plant). This and other species of *Eriogonum*, along with *Plantago ovata, Chorizanthe* species*,* and sometimes *Lepidium lemmonii, Coreopsis calliopsidea,* and other species can lend noticeable color to these exposures…
6113 = Mud Hills sparsely vegetated ephemeral herbs Mapping Unit

11'. This mapping unit is defined by extensive solid blocks of resistant rock of any type. In our area these may be volcanic extrusives such as basalt or rhyolite; igneous intrusives such as granodiorite, gabbro, or quartz monzonite; or sedimentary sandstones or limestones, etc. Large unfractured bedrock or boulders are typical, with narrow

crevices in different densities. Overall shrub and herb cover tends to be under 5%, making it difficult to distinguish any particularly dominant species. Mapping units of this type may include small (<10 acre) stands of *Ephedra viridis, E. nevadensis, Atriplex polycarpa, Encelia farinosa, Ericameria cuneata, E. teretifolia, Salazaria mexicana, Eriogonum fasciculatum,* and other alliances. Separate this from mud hills by erosional patterns (should see individual rock outcrops, boulders, etc) in this unit…

6115 = Massive sparsely vegetated rock outcrop Mapping Unit

Note: NVC has two additional alliances that fit in this cliff & rock outcrop MU (while other alliances that can also fit in this MU are already noted above in key step 3. under 6110):
6119 = *Aloysia wrightii – Pericome caudata – Ephedra nevadensis* (Oreganillo – Tailed pericome – Nevada joint fir scrub) sparsely vegetated cliff & rock outcrop Alliance, and

7111 = *Ephedra viridis - Chrysothamnus viscidiflorus - Rhus trilobata* (Mormon tea – Sticky-flowered rabbitbrush – Basket bush) Talus Sparse Scrub Alliance

1'. Vegetation easily visible and ≥5 % total cover (sometimes as low as 2% if evenly distributed) and characterized by trees, shrubs and/or herbs that are evenly distributed across the stand.

12. Vegetation dominated by broad-leaved or needle-leaved trees (or if in riparian, larger winter deciduous shrubs, such as *Salix* spp.) generally over 10% absolute cover. In the California desert, tree vegetation is typically taller than the average creosote-bush (*e.g.*, >3m tall). Characteristic species of the dominant layer are either winter deciduous or evergreen and do not exhibit xeromorphic characteristics such as thorns, drought-deciduousness, succulent stems or microphyllous leaves/leaflets. If growing in the desert ecoregion, growing in arroyos, washes, canyon bottoms, springs, seeps, or other areas that receive and retain more moisture than ambient desert settings...

1.C. Temperate Forest and Woodland Subclass

13. Vegetation is dominated by broad-leaved or needle-leaved trees or tall shrubs (such as willows). Not in uplands or dry washes, but in areas where moisture is present at least under the surface in the warmer months (near permanent surface or subsurface moisture). The majority of stands in the study area are riparian and the only truly flooded stands appear at the margins of permanent reservoirs in Palmdale and the western Antelope Valley...

Formation 1.C.3. Temperate Flooded and Swamp Forest
Division 1.C.3.c Western North America Warm Temperate Flooded and Swamp Forest 1400 = Southwestern North American Riparian, Flooded and Swamp Forest Macrogroup MG036 (now called M036 Warm Mediterranean & Desert Riparian, Flooded & Swamp Forest)

14. Stands are dominated or characterized by riparian winter deciduous,

broad-leaved trees or tall shrubs, including *Populus fremontii, Platanus racemosa,* and/or a species of *Salix.* If the tree canopy is between 5 and 10 percent absolute cover, the shrub canopy should not be more than double the tree canopy (otherwise, see 15'). Note that all diagnostics in this macrogroup and group are considered as such even as saplings when similar in size to mature individuals of shrubby *Salix,* (*e.g.,* S*. lasiolepis* and S. *exigua*.) Thus, if the stand has
>threshold cover for indicators of this group as saplings, even if there is similar or greater cover of shrub willow species, the stand would key to the tree type…
1410 = Southwestern North American riparian evergreen and deciduous woodland Group and 1520 Great Basin montane riparian shrub group (= Western montane- subalpine riparian & seep shrubland)

15. *Populus fremontii* or *Fraxinus velutina* is dominant or co-dominant, usually with >5% absolute cover in the tree canopy. Stands occur along streams, springs, and valleys with a subsurface water supply, and may be mapped to small clumps less than 1 acre. Stands may include *Salix, Forestiera, Baccharis,* etc. Stands co-dominated by tree willows such as *Salix gooddingii* or *S. laevigata* will key here. Shrubby *Salix lasiolepis*, *S. exigua*, or *Baccharis* spp. may be present with low to high cover in the understory…
1411 = *Populus fremontii - Fraxinus velutina - Salix gooddingii* (Fremont cottonwood - Velvet ash - Black willow forest) Alliance

15'. *Populus fremontii* or *Fraxinus velutina* is not dominant or co-dominant...

16. *Salix laevigata* or *Salix gooddingii* dominant in the overstory layer. Arroyo willow (*Salix lasiolepis)* may occur as a sub- or co-dominant in the shrub or low tree layer. If present, *S. lasiolepis <S. laevigata* and *Platanus racemosa, Populus* spp*.,* and *S. gooddingii* are all trace. Usually small stands associated with isolated springs and seeps, may be associated with *P. fremontii* or shrubby riparian stands of *Forestiera,*
S. exigua, etc. If present, *Platanus racemosa* and *Populus* spp. are both trace (either of these trees is present and co-dominant with *S. gooddingii* or *S. laevigata*, key to their respective alliances). Most stands are associated with the Mojave River or the Owens River, or are in permanently wet areas in the Antelope Valley and Owens Valley.....
1416 = *Salix gooddingii – Salix laevigata* (Black willow – Red willow thickets) Alliance (including two choices below):

Salix gooddingii strongly dominant in stands, while other tall woody shrubs may be subdominant…
1413 = *Salix gooddingii* (Black willow forest) Association

Salix laevigata is dominant, while other tall woody shrubs may be subdominant to co-dominant…

1412 = *Salix laevigata* (Red willow forest) Association

16'. *Salix gooddingii* or *S. laevigata* is not dominant...

17. *Platanus* racemosa is characteristic of the riparian tree canopy. If present, *Populus* spp. <*P*. *racemosa*. Along major stream courses, often associated with other stands of trees or shrubs within this macrogroup. Individuals of *P. racemosa* occur as far north as Victorville in the Mojave, but actual stands are limited to within a few miles of the edge of the ecoregion as at Rock Creek, Little Rock Creek, and several drainages emerging from the Tehachapi Mountains. Stands are common in the Cajon Pass area...

1414 = *Platanus racemosa* (California sycamore woodlands) Alliance

17'. Other riparian trees are dominant in the overstory…

18. *Betula occidentalis. Populus trichocarpa,* or *Robinia pseudoacacia* is dominant or co-dominant in stands. (three choices below)…

1520 Great Basin montane riparian shrub group (= Western montane- subalpine riparian & seep shrubland)

Betula occidentalis dominant or co-dominant with *Salix* spp. in stands. Along the west side of the Owens Valley in creeks and rivers…

1521 = *Betula occidentalis* (Water birch thickets) Alliance

Populus trichocarpa dominant in stands. Along the west-side of Owens Valley, occurring sporadically in creeks and rivers…

1512 = *Populus trichocarpa* (Black cottonwood forest) Alliance

Robinia pseudoacacia strongly dominant, occurring as plantings or as escaped invasive stands in the Owens Valley…

1611 = *Eucalyptus* spp. - *Ailanthus altissima - Robinia pseudoacacia* (Eucalyptus - Tree of heaven - Black locust groves) Semi-natural Alliance

18' Either *Alnus rhombifolia, Phoenix dactylifera,* or *Washingtonia filifera*
dominant…

19. Stands characterized by even distribution of

Washingtonia filifera and/or *Phoenix dactylifera*, associated with springs and moist canyon bottoms in a few places. Other riparian tree species (*Populus fremontii, Salix laevigata,* or *Prosopis glandulosa*) may be associated with them and may be co-dominant. Stands in the mapping area are mostly introduced in the recent past with the likely exception of Twentynine Palms Oasis and Fortynine Palms Canyon area (two choices below)…

1415 = *Washingtonia filifera* (California fan palm oasis) Alliance OR

1434 = *Phoenix dactylifera – Washingtonia filifera* (Date palm – California fan palm) Semi-Natural Stands (*introduced* stands)

19'. *Alnus rhombifolia* is present and evenly distributed in the riparian tree layer. If *Platanus* is present it is <1% cover and not evenly distributed; *Platanus* >1% keys to *Platanus* alliance. Occurs at extreme edge of study area near Valyermo and possibly other creeks that emerge from the Transverse Ranges…

1500 = Western Cordilleran Montane-Boreal Riparian Scrub and Forest MG034 (now called M034 Rocky Mountain & Great Basin Flooded & Swamp Forest)
1510 = Vancouverian riparian deciduous forest Group
1511 = *Alnus rhombifolia* (White alder groves) Forest Alliance

14'. Stands are dominated or characterized by native or non-native riparian shrubs. None of the above (couplet 15) tree species are present at significant cover or dispersion…

20. Native riparian shrubs of *Baccharis* spp*., Sambucus, Forestiera*, *Rosa woodsii, Vitis* spp., *Salix exigua* or *S. lasiolepis* are dominant or co-dominant*. Populus fremontii* and other *Salix* species may intermix at low cover and uneven distribution and tree willows or other riparian trees are <10% cover in the stand and/or are not evenly distributed… **1420 = Southwestern North American riparian/wash scrub Group and**

1520 = Great Basin montane riparian shrub group (= Western montane-subalpine riparian & seep shrubland group)

21. A *Baccharis* species is characteristic of the overstory shrub layer (three choices below)…

Shrublands characterized by the dominance of *Baccharis salicifolia,* usually with
>50% relative cover in shrub layer. An emergent and sparse tree layer of willows or other species may also be present. Found in upper arroyos on alluvial fans emerging from San Gabriel or San Bernardino Mountains, along the Mojave River at least to Victorville, and in the southern Sierra Nevada, often adjacent to *Populus fremontii, Salix gooddingii, Tamarix,* or other riparian stands…
1422 = *Baccharis salicifolia* (Mulefat thickets) Alliance

Baccharis sergiloides or *Baccharis emoryi* is dominant and characteristic; stands are usually small and associated with rocky granitic arroyos and narrow bouldery drainages adjacent to springs and seeps. Usually in desert mountains or ephemeral creeks in foothills of the Tehachapi, Liebre, or Transverse Ranges, and in the Jawbone study area…
1423 = *Baccharis emoryi - Baccharis sergiloides* (Emory's and Broom baccharis thickets) Alliance

Including the following: *Baccharis emoryi* >3% cover of a single stand and exceeds other shrubs in cover. Like *B. sergiloides*, it tends to occur in lower elevation ditches or washes, but not in granitic mountains near springs where
B. sergiloides is usually found. Only a few stands detected in the study area in the Colorado River Valley north of Blythe…
1421 = *Baccharis emoryi* (Emory's baccharis thickets) Provisional Association (not mapped and not inventoried in study area)

21'. A *Salix, Forestiera, or Sambucus* species is dominant in the shrub layer…

22. *Salix* is dominant (two choices below)…

Salix lasiolepis is dominant, though *S. exigua* may sometimes be co- dominant. Considered a shrub even though it may be taller than 5 m, it may be accompanied by *Baccharis salicifolia* or other riparian shrubs. Small stands occur adjacent to freshwater streams and drainages in the western portion of the mapping area, along Mojave River in Victorville, or at the margin of the desert ecoregion as near Cajon Pass or southern

Sierra Nevada or Owens Valley. If present, *S. laevigata <S. lasiolepis and P. racemosa, Populus spp.,* and *S. gooddingii* are all trace…
1427 = *Salix lasiolepis* (Arroyo willow thickets)

Salix exigua is characteristically present as a dominant or co-dominant shrub, usually with >5% absolute cover and >50% relative cover in shrub layer. It forms an open to continuous canopy along riparian corridors. It often forms narrow strips along major creeks and rivers and along ditches and reservoir edges. Other willow species may be present as sub-dominants with low cover, and *Baccharis salicifolia* may occasionally be co-dominant… **1424 = *Salix exigua* (Sandbar willow thickets) Alliance**

22'. *Forestiera pubescens, Rosa woodsii, Vitis girdiana,* or *Sambucus* are dominant (four choices below)…

Vitis girdiana dominant in the overstory. Often in canyon seeps, such as in the lower, eastern Sierra Nevada just above the Owens Valley….

1428 = *Vitis arizonica - Vitis girdiana* (Wild grape shrubland) Alliance

Forestiera pubescens is the dominant shrub or co-dominant with *Ericameria nauseosa* in the canopy, usually occurring locally around permanent water or subsurface moisture. Stands occur in the western part of the mapping area adjacent to alkaline flats or on steeper slopes along ravines in Sierra Pelona. Stands also occur in the Owens Valley and in montane foothill areas around isolated springs or in bottoms of narrow canyons in the foothills of the Sierra Nevada, Ord Mountains, and El Paso Mountains. Compared to the *Salix exigua* and *Populus fremontii* alliances*, Forestiera pubescens* appears to prefer slightly drier conditions as upslope from flowing water. Stands are usually dense with a sparse understory...
1425 = *Rhus trilobata – Crataegus rivularis – Forestiera pubescens*
(Basketbush - River hawthorn – Desert olive patches) Alliance

Rosa woodsii is the dominant shrub in the canopy, often in thickets adjacent to other riparian shrubland stands such as *Salix exigua* or *Ericameria nauseosa.* Found along the eastern Sierra Nevada and Owens Valley… **1522 = *Cornus sericea - Rosa woodsii - Ribes* spp. (Red osier - Interior rose - Gooseberry thickets) Alliance**

Sambucus nigra is dominant in the overstory (although other shorter shrubs such as *Artemisia tridentata* ssp. *tridentata* and *Eriodictyon* may be equal or somewhat higher in cover). Although considered a shrub, elderberry usually takes the form of a small tree, which forms open, well-spaced stands with a shorter shrub and herb understory. Mappable stands occur only in the margins of the study area including moist bottomlands adjacent to Mojave River near Hesperia, south to Mormon Rocks and Cajon Pass…

1426 = *Sambucus nigra* (Blue elderberry stands) Association

20'. Stands are dominated by non-native *Tamarix (chinensis, ramosissima*, etc.), tall reed *Arundo donax,* and/or non-native *Phragmites australis* (including the non-native subspecies or hybrids of *Phragmites australis*).

1430 = Southwestern North American introduced riparian scrub and herbaceous Group

23. Vegetation strongly dominated (usually >60% relative cover) by tall shrubby invasive *Tamarix* spp. (either *T. ramosissima, T. chinensis*, or other similar species, not including the less invasive, taller *T. aphylla*) over other native tall shrubs and/or low trees. *T. aphylla* (Athyl) trees are usually not invasive and remain in their originally planted arrangement (hortomorphic)…

1432 = *Tamarix* spp. (Tamarisk thickets) Semi-natural Stands

23'. Vegetation strongly dominated by tall herbaceous invasive species including
Arundo donax, hybrid Phragmites, and *Saccharum ravennae.* (two choices below)…

Arundo donax and/or *Phragmites australis* (non-native subspecies or hybrids) dominate as clonal clumps in moist areas. A few small stands occur in moist areas along ditches or occasionally in lines along property boundaries or planted as windbreaks. The characteristic signature of *Arundo* or hybrid *Arundo* X *Phragmites* should be sufficient to pull out small planted stands (exotic plantings as part of development polygons); the semi natural 1431 mapping unit is typically reserved for areas that are not planted or where stands are naturalizing and expanding…

1431 = *Phragmites australis - Arundo donax* (Common reed - Giant reed breaks) Semi-natural Stands

Saccharum ravennae dominates in moist areas. A few small stands along ditches and edges of the Colorado River…

1433 = *Saccharum ravennae* (Ravennagrass) Semi-natural Stands

13'. Vegetation characterized by trees not of wetland or moist low lying areas, although they may grow in washes, arroyos, playas and other intermittently flooded situations…

24. Forest and woodlands characterized by broad-leaved evergreen trees, sometimes with dwarfed stems and small, sclerophyllous leaves (in Mediterranean climates); or various combinations of broad-leaved deciduous, broad-leaved evergreen and needle-leaved evergreen conifer trees. Canopy may range from woodland to forest structure. Characteristic tree distributions are centered in Mediterranean California climate. Winters are mild (mostly frost-free), and may be the rainiest season; springs are temperate humid, summers are hot- dry, and autumn is often dry…

1.B.1. Warm Temperate Forest Formation (F018)

1100 = California Forest and Woodland Macrogroup MG009

25. Broadleaf evergreen or winter deciduous trees of California Mediterranean climate zone. Includes mostly oak trees of the genus *Quercus* in our area, but also includes small extralimital stands of *Aesculus californica* and *Juglans californica.* Either *Pinus sabiniana* or *Juniperus californica* also may be co-dominant with the oaks in stands (to be keyed in one of the oak alliances below) …

1110 = Californian broadleaf forest and woodland Group

26. One or more *Quercus* species are the primary overstory canopy tree, or oaks share dominance with conifers (five choices below)…

Quercus douglasii or *Q. x alvordiana* is dominant to co-dominant in the tree layer. Stands are often mixed with *Q. lobata, Q. chrysolepis*, where it must have >60% relative cover; yet when mixed with *Pinus sabiniana* or *Juniperus californica*, *Q. douglasii* has at least 30% relative cover. Generally only at the base of Liebre Mountains, in the extreme westernmost Tehachapi Mountains near Gorman, and in the southern Sierra Nevada. This alliance is mostly in sheltered locations such as bases of slopes or north-facing slopes or along rolling slopes of the Sierras… **1111 = *Quercus douglasii* (Blue oak woodland) Alliance**

Quercus lobata is dominant to co-dominant. May mix with *Quercus douglasii*, *Q. chrysolepis*, or *Pinus sabiniana*, but must be least 30% relative cover in canopy. Generally only at the base of the Liebre Mountains and in the extreme westernmost Tehachapi Mountains, or in other areas of the southern Sierra Nevada. Stands are usually in deeper, more mesic soils than *Q. douglasii* stands and are scattered in concave to sheltered (flat) slope positions. Exemplary stands are in Liebre Mountains between Gorman and Lone Pine Canyon Road… **1112 = *Quercus lobata* (Valley oak woodland) Alliance**

Quercus chrysolepis is dominant to co-dominant in the tree overstory. Along the Transverse Ranges and southern Sierra Nevada, on generally steep north-facing or concave exposures. If

co-occurring with other oaks (e.g., *Q. lobata or Q. wislizeni*), *Q. chrysolepis* must have at least 30% cover. If co-occurring with *Pinus monophylla* or *P. jeffreyi, Q. chrysolepis* must be >60% relative cover. If *Pseudotsuga macrocarpa* or one/both of these pines are co-dominant to dominant, then key to the respective conifer alliance.

1113 = *Quercus chrysolepis* (Canyon live oak forest) Alliance

Quercus kelloggii is dominant to co-dominant in the tree overstory. In the study area, it is only found along mid- to upper-elevations of the southern Sierra Nevada, often near *Pinus jeffreyi* or *Q. chrysolepis* stands…

1118 = *Quercus kelloggii* (California black oak forest) Alliance

Quercus wislizeni is dominant or co-dominant with >30% relative cover in the tree overstory. *Q. douglasii* and *Q. chrysolepis*, if present, occur at low cover (<30% relative canopy cover). Stands are limited to the north-facing bases of the Liebre and San Gabriel Mountains as far east as Cajon Pass and Silverwood Lake**.** Some stands are in low valleys or on terraces adjacent to true riparian woodlands. Many have been recently burned and are scrubby. *Q. wislizeni* ssp. *frutescens* alliance (which keys in the pre-montane chaparral group) also has been identified in the southern Sierra Nevada …

1114 = *Quercus wislizeni* (Interior live oak woodland & chaparral) Alliance

Quercus agrifolia is dominant to co-dominant in the tree overstory, sometimes with *Q. douglasii*. Appears rarely in the map area, along the base of the Tehachapi Mountains, near the far western tip of the mapping area, on lower slopes above intermittent streams with *Platanus racemosa* Alliance. One inventoried stand with *Q. douglasii* had insufficient relative tree cover for this *Q. agrifolia* Alliance (< 30%) and keyed to *Q. douglasii* Alliance. Another nearby stand with scattered *Q. agrifolia* as the major tree component was tentatively keyed to *Q. agrifolia*. Other stands exist in Transverse Range near, but outside of mapping area (e.g., south of Cajon Pass).…

1117 = *Quercus agrifolia* (Coast live oak woodland & forest) Alliance

26’. Broad-leaf trees other than oaks are dominant or co-dominant (two choices below)…

Juglans californica provides an open to intermittent tree overstory canopy (in some cases it may be a large shrub). Stands are limited in the coastal drainages south of Cajon Pass, associated with seeps and springs. Shrubs of chaparral *(Ceanothus* sp.,

Heteromeles arbutifolia, etc.) may occur in the understory… **1115 = *Juglans* californica (California walnut groves) Alliance** (not mapped and not inventoried in study area)

Aesculus californica is dominant (>60% relative cover) as a tree or tall shrub in the overstory. If buckeye is co-dominant with an oak species, see the *Quercus douglasii* and *Quercus wislizeni* Alliances. Only in the extreme western portion of the study area on north facing or concave slopes of the Liebre Mountains, adjacent to stands of chaparral or *Q. wislizeni*…
1116 = *Aesculus californica* (California buckeye groves) Alliance

25'. Canopy dominated by conifers, locally, either short shrubby trees of *Juniperus californica* or by taller *Pinus sabiniana* or *Pinus coulteri*. Stands with other xeromorphic or mesomorphic trees may occur (*Yucca brevifolia, Quercus lobata, Q. douglasii, Q. chrysolepis*), if so, different relative cover rules apply, see comments within key to alliances in this group.
1120 = Californian evergreen coniferous forest and woodland Group (three choices below)…

Pinus sabiniana is the dominant tree in the overstory (>60% relative cover), and generally has >10% absolute cover. Stands identifiable as the alliance occur largely over herbaceous or mixed chaparral shrub and herb understories. Stands are limited in extent, usually in proximity to *Quercus john-tuckeri* (shrub), *Q. lobata* or *Q. douglasii* stands. Most stands occur over grassy understory in northwest Liebre Mountains and in the southern Sierra Nevada….
1121 = *Pinus sabiniana* (Foothill pine woodland) Alliance

Juniperus californica is evenly distributed and dominant in the tree or tall shrub layer. If *Quercus douglasii, Yucca brevifolia* or *Quercus john-tuckeri* is present and evenly distributed, it has less than 30% relative cover (e.g., if *J. californica* >10% absolute cover, then *Y. brevifolia* has no more than 4 % absolute cover, or if *J. californica* is 4% and *Quercus john-tuckeri* is <2% goes to *Juniperus*) in the tree or tall shrub layer. In other words, when *Y. brevifolia* is present, *Juniperus* must have at least 3X its cover. Most stands range from 3 to 15% absolute *J. californica* cover. When sparse (*e.g.*, <5%), the general rule is that *J. californica* is evenly distributed and, if present with large shrubs such as *Purshia tridentata, Adenostoma fasciculata,* or *Arctostaphylos glauca*, they must have strong dominance to fall within their own alliances. This is because although *J. californica* is considered a "tree" it is ecologically a large shrub…
1122 = *Juniperus californica* (California juniper woodland) Alliance

Pinus coulteri stands are restricted to mid- to upper-elevations of the Transverse Ranges…
1123 = *Pinus coulteri* (Coulter pine woodland) Alliance

24’. Stands are pure or mixed broad-leaved deciduous or needle-leaved evergreen tree growth forms, with a seasonal green understory of herbs. Winters are cool and summers may receive some montane thunderstorms. The tall-shrub layer is variable. Stands occur in higher elevation areas at the edge of the desert in the Transverse Ranges or Sierra Nevada, or in highest desert mountains. Snow may be on the ground between <1 to 6 months of the year…

1.B.2. Cool Temperate Forest Formation (F008)

27. Stands characterized by *Abies concolor, Pseudotsuga macrocarpa* or *Pinus jeffreyi,* present and evenly distributed in canopy, usually with *Quercus chrysolepis* and/or *Q. kelloggii* co-dominant, which may be up to 3 times the cover (*e.g.*, *Q. chrysolepis* 30%, while *Pseudotsuga macrocarpa* or *P. jeffreyi* 10%).…

1200 = Californian-Vancouverian Montane and Foothill Forest Macrogroup MG023 (now called M023 Southern Vancouverian Montane & Foothill Forest)

1210 = Californian montane conifer forest Group

Pseudotsuga macrocarpa stands are restricted to sheltered sites (sheltered from canopy fire and relatively steep and shady lower canyons and slopes) in Liebre and San Gabriel Mountains….

1211 = *Pseudotsuga macrocarpa* (Bigcone Douglas-fir forest) Alliance

Pinus jeffreyi stands are restricted mid- to upper-elevations of the southern Sierra Nevada, such as in the Piute Peak and Owens Peak areas…

1213 = *Pinus jeffreyi* (Jeffrey pine forest) Alliance

Abies concolor stands (California race) restricted to highest elevation ridges of the study area (e.g., ridgeline above the Lehigh quarry, upper north-facing slopes in the San Emigdio Mtns.) in the southern Sierra Nevada typically with *Quercus kelloggii*… **1212 = *Abies concolor* (Sierran white fir forest) Alliance**

27’. *Abies concolor* or *Pinus monophylla* >3% absolute cover, especially in higher elevations of the Mojave Desert (two choices below):

Abies concolor stands (Rocky Mountain race) restricted to high elevation, north-facing slopes in the Mojave Desert typically with *Pinus monophylla* such as in the Kingston and Clark mountains…

1800 = Southern Rocky Mountain Lower Montane Forest Macrogroup M022 1810 = Southern Rocky Mountain White Fir - Douglas-fir Dry Forest Group 1811 = Abies concolor Dry (White fir dry forest) Alliance

Pinus monophylla evenly distributed throughout the stand. Stand may

have equal or higher cover of *Juniperus californica, Yucca brevifolia* and/or shrubs such as *Quercus john-tuckeri.* Difficulty in stand identification exists at ecoregional boundaries in stands with co-dominance of *Juniperus californica* or with scrub oaks such as *Quercus john- tuckeri* or other tall chaparral species such as *Fremontodendron californica*, *Cercocarpus montanus, Arctostaphylos glandulosa,* etc. If these species are present and <10% absolute cover, *Pinus monophylla* must be >3% absolute cover and evenly distributed in the stand (usually it is at least 5% cover and evenly distributed). If chaparral species are >25% absolute cover throughout the stand, *P. monophylla* must be >10% absolute cover (e.g., scattered low cover *P. monophylla* is overruled by dense chaparral stands). If *Yucca brevifolia* is present and >1% cover, the stand must have
>3x as much *Pinus monophylla* to be *Pinus (Yucca brevifolia* takes precedence when co-dominant). If *Juniperus californica* is present, *Juniperus* must have >3x as much absolute cover as *Pinus monophylla* (which takes precedence when co-dominant)… **1300 = Intermountain Basins Pinyon-Juniper Woodland Macrogroup MG026 1310 = Western Great Basin montane conifer woodland Group**
1311 = *Pinus monophylla* (Singleleaf pinyon woodland) Alliance

12'. Vegetation dominated by shrubs or herbs; trees if present, generally <10% absolute cover, or if greater cover, then characterized by trees with xeromorphic features such as succulence, spines, or drought-deciduousness…

28. Vegetation dominated by mesomorphic grasses and shrubs, with or without scattered trees (and trees typically <10% cover), ranging from temperate coastal and inland lowland and montane grasslands and shrublands, to bogs, fens, and marshes, with a strongly seasonal climate, with at least some frost to extended cold seasons. Occasional desert border stands have a mixing of mesomorphic and xeromorphic (class 2000, mixing with desert classes 4000 and 5000) species. The woody species of the predominant class (*e.g.*, chaparral shrubs with small proportion of emergent xerophyll Joshua Trees) would prevail in the key…
2000 = MESOMORPHIC SHRUB AND HERB CLASS (2 Temperate & Boreal Shrubland & Grassland)

29. Vegetation defined by plant growth strategies driven by a Mediterranean climate, characterized by dry summers and mild, humid, sometimes rainy winters. Sclerophyll-leaved shrub growth forms prevail, though drought-deciduous forms also occur. Size and coverage of the shrubs range from arborescent (2m to 5m tall) with a closed canopy, to <1m and open. Mediterranean grassland and meadow are included in this formation. In California, these scrubs are separated out at the macrogroup level, where they occur primarily in the western Mojave adjacent to the Transverse Ranges and the southern Sierra Nevada and Tehachapi Mountains where

enough winter moisture affords persisting stands of non-desert chaparral, coastal scrub, and related grasslands…

2.B Mediterranean Scrub & Grassland Subclass

30. Vegetation characterized by shrubs averaging ≥10% in even distribution over the stand and herbaceous species not predominant.

2.B.1. Mediterranean Scrub & Grassland Formation (F038) D021 California Grassland & Meadow Division

31. Shrubby sclerophylls (formation typically known as chaparral) dominant in the overstory; indicator genera include *Arctostaphylos, Adenostoma, Ceanothus, Fremontodendron, Quercus* (scrub oak species), etc. Note that at the margins of the desert, chaparral intermingles with desert scrub where unusual stand composition can occur. When diagnostic chaparral shrub species is/are present and make up
>50% relative cover of the shrub overstory and are evenly distributed, the stand keys to a member of this group…

2100 = California Chaparral Macrogroup MG043

32. Sclerophyll shrublands have dominance of one or more of the following species: *Adenostoma fasciculatum, Arctostaphylos glauca, A. viscida, Ceanothus crassifolius*, *C. cuneatus,* or *Fremontodendron*. Stands may have co-dominance of drought-deciduous *Salvia mellifera*. This chaparral group is located inland from maritime chaparral of sea level up to 2000m (6400ft) elevation from northern Baja California, Mexico, across California and into southwestern Oregon. Most stands occur on well-drained soils on exposures that are in full sun much of the growing season including slopes, spur ridges, and convexities. This group is made up of a mixture of obligate seeders, facultative seeders, and resprouters…

2110 = Californian xeric chaparral Group

33. *Adenostoma fasciculatum* is the sole dominant or is co-dominant with *Salvia mellifera, Eriogonum fasciculatum* or a species of *Eriodictyon.* If *Quercus berberidifolia* or *Cercocarpus montanus* co-dominates, see leads 35 and 35', respectively (two choices below)…

A*denostoma fasciculatum* occurs as a dominant, or as a co-dominant with *Eriogonum fasciculatum* or other shrubs such as *Eriodictyon crassifolium* or *E. trichocalyx*. If co-dominant with *Arctostaphylos glauca,* then key to *A. glauca* alliance. Occurs along the margins of the Transverse Range and the Tehachapi Mountains (probably mostly out of our area in the Tehachapis). Found on convex slopes above stands of *Quercus john- tuckeri, Artemisia tridentata, Salazaria*

mexicana, and *Eriogonum fasciculatum* on slopes ramping up to Cajon Pass area…
2112 = *Adenostoma fasciculatum* (Chamise chaparral) Alliance

Salvia mellifera shares dominance with *Adenostoma fasciculatum* in the shrub canopy, with *A. fasciculatum* sometimes having twice as much cover as *S. mellifera*. Only a few stands occur in coastal drainages on steep south- or west-facing. Mostly sandstone slopes south of Cajon Pass, south and east of Mormon Rocks...
2115 = *Adenostoma fasciculatum – Salvia mellifera* (Chamise - Black sage chaparral) Alliance

33'. Species other than *Adenostoma fasciculatum* are dominant or co- dominant (five choices below)…

Arctostaphylos glauca is the dominant or co-dominant overstory shrub (locally especially with *Adenostoma fasciculatum*); conifers (*Pinus monophylla, Juniperus californica*) absent or in very low cover. Occurs only on the edges of the study area in the Tehachapi Mountains or Transverse Ranges, usually adjacent to other chaparral stands. Most stands are small, sometimes on steep slopes mixed with scattered *Yucca brevifolia.* Largest stands in map area are near Cajon Pass…
2111 = *Arctostaphylos glauca* (Bigberry manzanita chaparral) Alliance

Arctostaphylos viscida is the dominant or co-dominant in overstory shrub; conifers (*Pinus, Juniperus*) absent or in very low cover. Occurs only in the southern Sierra Nevada, on steep convex slopes…
2117 = *Arctostaphylos viscida* (Whiteleaf manzanita chaparral) Alliance

Ceanothus crassifolius usually occurs as a dominant or as a co-dominant with other chaparral shrubs (*e.g.*, *Adenostoma fasciculatum, Heteromeles arbutifolia* and *Cercocarpus montanus*). Only occurs in the southern portion of the mapping area, southwest of Cajon Pass, which drains to the Santa Ana River and Pacific Ocean…
2113 = *Ceanothus crassifolius* (Hoary leaf ceanothus chaparral) Alliance

Ceanothus cuneatus is the dominant overstory shrub or co-dominant with other chaparral shrubs such as *Adenostoma fasciculatum*. Only occurs in the southern Sierra Nevada, on mid-elevation slopes often in post-burn areas or intermixed

with *Quercus douglasii* woodlands…
2116 = *Ceanothus cuneatus* (Wedgeleaf ceanothus chaparral) Alliance

Fremontodendron californicum dominant with a mixture of desert chaparral and shorter shrubs including *Purshia tridentata, Hesperoyucca whipplei, Eriodictyon trichocalyx, Eriogonum fasciculatum, Ceanothus greggii, Cercocarpus montanus, Ceanothus leucodermis, Ericameria linearifolia, Salvia dorrii Artemisia tridentata* ssp. *tridentata,* and scattered emergent *Yucca brevifolia.* Often occurs in disturbed areas (post-burn or washes) or lower steep colluvial slopes of mountains. Often adjacent to *Quercus john- tuckeri, Adenostoma fasciculatum, Pinus monophylla* and *Yucca brevifolia stands,* or recent burns with *Encelia actoni* and *Eriogonum fasciculatum s*tands…
3316 *Ceanothus greggii – Fremontodendron californicum* (Cupleaf ceanothus – Flannelbush chaparral) Alliance)

Including the 2114 = *Fremontodendron californicum* (Flannelbush scrub) Association

32’. Chaparral stands of either cooler (winters with regular frost or snow) or moister (north-facing slopes and concavities) environments than previous group. Other shrub species predominant than those listed in couplet 32…

34. Stands are either co-dominated or dominated by *Arctostaphylos glandulosa* or *Ceanothus leucodermis*. These sclerophyllous shrubs are more frost-tolerant and found at higher, cooler and generally more mesic sites than the California Xeric Chaparral Group or the California Mesic Sclerophyll Scrub Group. They are particularly well-developed in central and southern California mountains between 1000 and 2000m, and tend to be composed of shrubs that can both resprout and are obligate seeding … **2120 = Californian mesic and premontane chaparral Group** (two choices below)

Arctostaphylos glandulosa occurs as a dominant or co-dominant in the shrub overstory. Stands are found on north-facing slopes, outcrops, and ridges on shallow soils, only on the desert-facing slopes of the San Gabriel Mountains as near Pine Creek and south of Mormon Rocks or near Hwy 2 and Desert-Front Road. Common only on open ridges and convex slopes surrounded by other chaparral stands (e.g., *Adenostoma fasciculatum* or *Quercus berberidifolia*). Difficult to tell from *Arctostaphylos glauca* in some cases without burl

inspection…

2121 = *Arctostaphylos glandulosa* (Eastwood manzanita chaparral) Alliance

Ceanothus leucodermis characterizes the shrub canopy as a dominant or co-dominant. No consistent canopy tree overstory (top-killed stems of short resprouts of *Quercus wislizeni* may be present, though). Stands are found primarily on north-facing slopes only in recently burned areas of the Liebre Mountains. A common post-fire regeneration type following a 2000 fire in *Quercus wislizeni* and some resprouting chaparral stands.

Occurs adjacent to *Q. lobata* stands as well…

2123 = *Ceanothus oliganthus - Ceanothus leucodermis (*Hairy leaf ceanothus – Chaparral whitethorn chaparral) Alliance

Including the 2122 = *Ceanothus leucodermis* (Chaparral whitethorn chaparral) Association

34'. This shrubland group occurs in mesic site conditions such as north- facing slopes, concavities and toeslopes with well-drained soils throughout Mediterranean California, mostly inland from the coastal fog belt. It occurs most often on north-facing slopes up to 1600m (5250 ft) in elevation and up to 1830m (6000ft) in southern California. This group tends to be dominated by a variety of mixed or single-species, evergreen, sclerophyllous shrubs that resprout from lignotubers following fire…

2120 = Californian mesic and pre-montane chaparral Group

35. Stands characterized by *Quercus berberidifolia* or *Quercus wislizeni* with or without co-dominance of *Adenostoma fasciculatum* (two choices below)…

Quercus berberidifolia usually occurs as a dominant or, it co- dominates with various shrubs including *Cercocarpus montanus* and *Ceanothus* spp. If it co-dominates with *Adenostoma fasciculatum,* it is a separate association of this alliance (see below).. It is only in the southern part of the mapping area, southwest of Cajon Pass, and likely does not occur in the Liebre Mountains. Individuals of *Q. berberidifolia* occur within *Q. john-tuckeri* stands near Cajon Pass, and they are difficult to discriminate from *Q. john-tuckeri* alliance.

When in doubt go with surrounding associated species; if desert mix then *Q. john-tuckeri*, if mostly other California

chaparral species, then *Q. berberidifolia* …
2132 = *Quercus berberidifolia* (Scrub oak chaparral) Alliance

Including the following: *Quercus berberidifolia* co-dominates with *Adenostoma fasciculatum* (*A. fasciculatum* and *Q. berberidifolia* each having greater than 15% relative cover in the shrub layer). Other shrubs in the stands have significantly less cover. Only in Cajon Pass and Pine Creek area…
2133 = *Quercus berberidifolia – Adenostoma fasciculatum*
(Scrub oak - Chamise chaparral) Association

Quercus wislizeni var. *frutescens* is dominant or is co-dominant with shrubs such as *Ceanothus* species or *Cercocarpus montanus*. *Pinus sabiniana* may be scattered in stands. Found in southern Sierra Nevada. Since shrub stands can be too difficult to differentiate from tree stands of *Q. wislizeni,* they are being mapped as one unit… **1114 = *Quercus wislizeni* (Interior live oak woodland and chaparral) Alliance**

35'. Stands characterized by *Cercocarpus montanus* or *Prunus ilicifolia*
as dominants or co-dominants (two choices below)…

Cercocarpus montanus >30% relative cover in the shrub canopy. *Adenostoma fasciculatum, Arctostaphylos glauca, Artemisia tridentata* spp. *tridentata, Ceanothus* spp., *Quercus john-tuckeri* or *Eriogonum fasciculatum* may have similar cover. Found in the northwest Liebre Mountains in the extreme west of mapping area, on north slopes of San Gabriel Mountains or Cajon Pass area, and in the southern Sierra Nevada. Usually associated with the *Quercus john-tuckeri*, *Arctostaphylos glauca, Eriogonum fasciculatum* or *Adenostoma fasciculatum* alliances. May have emergent *Pinus sabiniana* or *P. monophylla...*
2131 = *Cercocarpus montanus* (Birchleaf mountain mahogany chaparral) Alliance

Stands dominated or co-dominated by *Prunus ilicifolia*. *Heteromeles arbutifolia* or a species of *Eriodictyon* may be co-dominant. If *Quercus john-tuckeri* co-dominates, the stand keys to *Q. john-tuckeri* alliance. Rare in the study area; usually on either steep south- or east-facing

slopes near Canon Pass…
2134 = *Prunus ilicifolia - Heteromeles arbutifolia* (Holly leaf cherry - Toyon chaparral) Alliance

31'. Stands dominated by drought-deciduous shrubs, though at times can have characteristic but not dominant deep-rooted sclerophyll shrubs. Stands are mixed coastal shrublands from central California south into Baja, Mexico. They generally occur below 1500m (5000ft) elevation and can extend inland from the maritime zone in hotter, drier conditions. Moisture typically comes from winter and spring rains. Most predominant shrubs include *Artemisia californica, Salvia mellifera, S. apiana, S. leucophylla, Encelia californica, Eriogonum fasciculatum, E. cinereum*, *Hesperoyucca whipplei,* and *Opuntia littoralis*. On recently disturbed sites, such as after fire, *Diplacus aurantiacus, Lotus scoparius*, *Lupinus albifrons* and/or *Lupinus* can be dominant. Note: *Eriogonum fasciculatum* alliance stands occur in different expressions across the study area, including coastal scrub stands on the margins of the Transverse Ranges and Tehachapi Mountains, often adjacent to chaparral, and desert stands often mixed with *Ephedra nevadensis, Yucca* spp*., Viguiera parishii, Simmondsia chinensis, Grayia spinosa,* and other desert shrubs. *E. fasciculatum* alliance with mostly cismontane species will be found in this macrogroup, and a separate alliance with primarily desert species in the Inter-Mountain Dry Shrubland and Grassland Macrogroup MG098. Dominance in membership rules in the desert macrogroup will align with desert scrub cover and thus will be only ≥2% cover as long as no other shrub exceeds *E. fasciculatum* in cover…
2200 = California Coastal Scrub Macrogroup MG044

36. Stands usually open and/or display recent evidence of fire or other disturbance. Stands are dominated or co-dominated by the following species: *Gutierrezia californica, Lotus scoparius, Lupinus albifrons, Lupinus excubitus, Ericameria linearifolia,* or a species of *Eriodictyon, Malacothamnus fasciculatus, Eriogonum elongatum, Eriogonum nudum*, *Corethrogyne filaginifolia, Dendromecon rigida…*

2210 = Central and south coastal California seral scrub Group (nine choices below)…

The short shrub, *Gutierrezia californica* dominates an open shrub canopy, and other shrubs may occur at low cover. The herb layer is usually well- developed, including natives such as *Poa secunda* and non-natives such as *Bromus* and *Erodium* species. Appears in western Antelope Valley associated with grasslands…
2211 = *Gutierrezia californica* (California match weed

patches) Provisional Alliance (not mapped and not inventoried in study area)

Successional shrublands occurring in chaparral or coastal sage scrub in which short-lived subshrubs or shrubs of *Lotus scoparius* or *Lupinus albifrons* dominate following disturbance, particularly fire. The shrub canopy is sometimes over a higher cover of annual or perennial herbs such as *Bromus* spp., *Corethrogyne filaginifolia, Nassella, Erodium* spp., *Avena* spp., etc.
Stands have been observed such as the area that drains to the Pacific Ocean in the vicinity of Cajon Pass…
7520 = *Lotus scoparius - Lupinus albifrons - Eriodictyon* spp. (Deer weed - Silver bush lupine - Yerba santa scrub) Alliance (not mapped and not inventoried in study area)

Including the following:
2212 = *Lotus scoparius* (Deer weed scrub) Association And
2213 = *Lupinus albifrons* (Silver bush lupine scrub) Association

Another lupine, such as *Lupinus excubitus,* dominates or co-dominates the canopy and grows on slopes that are post-burn or other disturbance. Low cover of other shrubs may be present including *Purshia glandulosa, Gutierrezia* spp., and *Eriogonum fasciculatum*. Herbs often high in cover including *Mentzelia* spp., *Chaenactis xantiana, Coreopsis bigelovii,* annual *Eriogonum* spp., etc.
2217 = *Corethrogyne filaginifolia - Eriogonum* (elongatum, nudum) (Sand-aster - Perennial buckwheat fields) Alliance

Including the 2219 = *Lupinus excubitus - Mentzelia albicaulis - Eriogonum* spp. (Grape soda lupine - White blazingstar – Annual buckwheat) Association

Ericameria linearifolia is dominant to co-dominant in the shrub canopy with *Isomeris arborea* and/or *Gutierrezia californica, Eriophyllum confertiflorum, Eriogonum fasciculatum, Gutierrezia sarothrae,* and others. The herb layer can be well-developed, and *Poa secunda* is characteristically present…
2214 = *Ericameria linearifolia - Cleome isomeris* (Narrowleaf goldenbush - bladderpod scrub) Alliance

An *Eriodictyon* species dominates and *Eriogonum fasciculatum* often intermixes. Locally stands are dominated by *E. trichocalyx* or *E. crassifolium.* Typically, stands are *E. crassifolium* on the north side of the Liebre Mountains and *E. trichocalyx* on the

north side of the San Gabriel and San Bernardino Mountains and in the Cajon Pass region...
7520 = *Lotus scoparius – Lupinus albifrons – Eriodictyon* spp. (Deer weed - Silver bush lupine - Yerba santa scrub) Alliance

Including the 2215 = *Eriodictyon (crassifolium, trichocalyx*) (Thick leaf and hairy yerba santa scrub) Provisional Association

Malacothamnus fasciculata or *Malacothamnus fremontii* dominates recently burned chaparral. No mappable stands have been inventoried, but small patches occur in the vicinity of the Liebre Mountains and Cajon Pass… **2216 = *Malacothamnus fasciculatus* - *Malacothamnus* spp. (Bush mallow scrub) Alliance** (not mapped and not inventoried in study area)

Corethrogyne filaginifolia, Eriogonum elongatum, or *E. nudum* occur within herbaceous stands often co-dominated by native and non-native grasses and annual forbs. These perennial herbs are sometimes abundant colonizers of recent burns or areas released from regular grazing in the foothill regions of the west Mojave Desert. Also found as small sub-MMU stands occur in the vicinity of Cajon Pass and the northern Liebre Mountains foothills …
2217 = *Corethrogyne filaginifolia - Eriogonum* (*elongatum, nudum*) (Sand-aster - Perennial buckwheat fields) Alliance

Including the following: *Corethrogyne filaginifolia* characterizes stands, typically with highest cover in recently burned margins of chaparral or coastal sage scrub in foothills of the Western Mojave Desert, in the vicinity of Cajon Pass, and northern Liebre Mountains foothills…
2218 = *Corethrogyne filaginifolia* (Sand-aster scrub) Association

Dendromecon rigida, a short-lived shrub characteristic of recent post fire chaparral stands at the border of the study area, is dominant. Only one stand is mapped near Cajon Pass. Post fire stands are to be expected in similar areas of chaparral. Usually within a few years, stands are replaced by longer lived shrubs such as *Adenostoma fasciculatum* or *Quercus berberidifolia*…
7520 = *Lotus scoparius – Lupinus albifrons – Eriodictyon* spp. (Deer weed - Silver bush lupine - Yerba santa scrub) Alliance

Including the 5216 = *Dendromecon rigida* (Bush

poppy scrub) Association

36'. Stands are characterized by the presence of *Eriogonum fasciculatum, Hesperoyucca whipplei, Artemisia californica, Salvia mellifera*, *Eriogonum wrightii, Eriogonum heermannii, Buddleja utahensis, Dedeckera utahensis,* and other sub-shrubs without significant cover of the previous group of seral scrubs… **2220 = Central and South Coastal Californian coastal sage scrub Group and** (five choices below)...

Eriogonum fasciculatum typically ≥2% absolute cover or >50% relative cover in the shrub canopy, but read full description for exceptions. Most pure stands occur along the east face of the Tehachapi and Scodie Mountains and southeastern edge of the Sierras. In the desert hills and mountains >1000m (3000ft) elevation, *Eriogonum fasciculatum* occurs with many other semi-desert shrubs; if *Encelia actoni, Ericameria teretifolia, Purshia tridentata, or Ericameria linearifolia* are equal or higher cover, stands key to those alliances. *Hyptis emoryi* or *Salvia dorrii* may be higher than *E. fasciculatum* and still be in this Alliance (Thomas et al. 2004). Mixed stands with *Ephedra nevadensis, Ambrosia salsola, Ericameria cooperi, Grayia spinosa,* and other mid elevation shrubs only require *Eriogonum fasciculatum* to be higher cover and/or more evenly distributed than any of the other shrubs…
2221 = *Eriogonum fasciculatum - Viguiera parishii* (California buckwheat - Parish's goldeneye scrub) Alliance

Eriogonum fasciculatum dominant and occurring with cis-montane shrubs, such as *Artemisia californica, Salvia mellifera,* and *Lotus scoparius;* or *Hesperoyucca whipplei* is the dominant or co-dominant with *Eriogonum fasciculatum, Ephedra californica,* or *Lupinus albifrons* in cismontane stands.. **2226 = *Eriogonum fasciculatum* (California buckwheat scrub) Alliance**

Salvia mellifera usually >60% or combined with a coastal scrub species >30% relative cover in the shrub canopy (Klein and Evens 2005, Keeler-Wolf and Evens 2006). Only occurs southwest of Palmdale on Sierra Pelona and Signal Ridge adjacent to the California Aqueduct…
2223 = *Salvia mellifera* (Black sage scrub) Alliance (not mapped and not inventoried in study area)

Artemisia californica > 50% relative cover, though sometimes it

may co- dominate with *Eriogonum fasciculatum*, and occurring with other cismontane shrubs such as *Salvia* spp…
2225 = *Artemisia californica* (California sagebrush scrub) Alliance

Eriogonum wrightii, Eriogonum heermannii, Buddleja utahensis, Hecastocleis shockleyi is/are dominant or co-dominant. Often associated with *Eriogonum fasciculatum, Ericameria cooperi,* and *Prunus fasciculata* stands in the vicinity of Hesperia, Cajon Pass, and the southern Sierras. May have emergent *Yucca brevifolia* or *Juniperus californica…*
2222 = *Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis* (Wright's buckwheat - Heermann's buckwheat - Utah butterfly bush patches) Alliance

30'. Vegetation characterized by grasses and herbs adapted to Mediterranean climates. Shrubs, if present, not >10% and/or not evenly distributed in the stand…
2.B.2 Mediterranean Grassland & Forb Meadow
Formation D021 California Grassland & Meadow
Division
2300 = California Annual and Perennial Grassland Macrogroup MG045
Note: stands that are assumed to contain native species especially without wildflower color signature are placed into this mapping unit…
2305 = California annual and perennial grassland Mapping Unit (Native component)

37. Stands dominated or characterized by mostly annual grasses and forbs. Native herbs are characteristic and evenly distributed across the herbaceous layer, though non-native forbs and grasses may be dominant. Cover and composition vary year to year, but indicators usually present in sufficient amounts to differentiate from non- native stands. Diagnostic species include *Amsinckia* spp., *Coreopsis* spp,, *Chaenactis* spp., *Eschscholzia* spp., *Lasthenia* spp., *Plantago erecta* and *Vulpia microstachys*…
2310 = California annual forb/grass vegetation Group

38. *Eschscholzia californica* and/or *Lupinus nanus* is seasonally dominant on upland slopes or flats with well-drained sandy to loamy soils. *Amsinckia, Avena, Bromus, Castilleja exserta, Erodium cicutarium, Lupinus bicolor, L. microcarpus, Uropappus lindleyi* and a variety of other native and non-native forbs and grasses may be present. Known from famous wildflower fields in Antelope Valley on non- alkaline soils from west of Lancaster and Palmdale to Gorman; associated with *Poa secunda, Achnatherum speciosum, Gutierrezia, Eriogonum fasciculatum, Ericameria linearifolia,* and *E. nauseosa* alliance stands. Tolerates regular spring grazing and some agricultural tilling history…

2311 = *Eschscholzia (californica) - Lupinus (nanus*) (California poppy - Sky lupine fields) Alliance

38'. *Eschscholzia californica* is not conspicuous in the spring flowering season. Other wildflower species characteristic of Mediterranean California are present…

39. *Amsinckia menziesii, A. intermedia, A. tessellata, A. vernicosa,* and/or *Phacelia* spp. are seasonally characteristic in the herbaceous layer with greater than or equal to 10% relative cover. Soils are often well-drained and loamy and may have high levels of bioturbation (*e.g.,* rodent burrows) and/or high levels of (past/current) grazing. Stands also occur well into the central Mojave Desert in good rainfall years in recently disturbed (mostly burned) desert scrub…
2312 = *Amsinckia (menziesii, tessellata) - Phacelia* spp. (Fiddleneck - Phacelia fields) Alliance

39'. Other forb species besides *Amsinckia* and *Phacelia* are characteristic and/or dominant in proper phenology (three choices below)…

Native annual species *Vulpia microstachys*, *Plantago erecta* and/or *Lasthenia californica* (or *L. gracilis)* are characteristically present in stands and usually at least 10% relative in cover to other herbs. Other native species such as *Castilleja exserta, Crassula connata, Lepidium nitidum, Lupinus,* and *Trifolium* species are often well-represented (and sometimes co-dominant to dominant) as well as a variety of herbs. Soils may be clayey, wet to moist in spring and dry by summer. Stands occur in Antelope Valley west of Lancaster and Palmdale, but may occur in clearings in *Larrea tridentata* or related alliances all the way to the Granite and Sidewinder Mountains. Stands with an even distribution of *Larrea* or other desert shrubs >2% would key to the shrub type. Must have properly timed surveys / aerial imagery for detection…
2313 = *Lasthenia californica - Plantago erecta - Vulpia microstachys* (California goldfields - Dwarf plantain - Six-weeks fescue flower fields) Alliance

Monolopia lanceolata is seasonally dominant or co-dominant on fine- textured, moderate to steep slopes, or *Coreopsis calliopsidea* is the dominant annual herb. Less than 2% absolute shrub cover and/or shrubs not evenly distributed. Stands form bright golden-yellow seasonal patches on fine textured soils in the West Mojave (especially the area around Four Corners). [Note: *Coreopsis calliopsidea* is actually likely to be a better indicator of mud hills and clay beds (6113) in

the Lithomorphic class than of California annual forb/grass vegetation Group (2310)]…
2314 = *Monolopia (lanceolata) - Coreopsis (calliopsidea)* (*Monolopia* and Tickseed fields) Alliance

Including: Other herbs are high in cover, including *Coreopsis bigelovii, Chaenactis xantiana, Layia glandulosa, Mentzelia* spp., *Eriogonum* spp., etc., while *Lupinus excubitus,* may be emergent in a sparse shrub canopy and grows on slopes that are post-burn or other disturbance.
Low cover of other shrubs may be present including *Purshia glandulosa, Gutierrezia* spp., and *Eriogonum fasciculatum*… ***Coreopsis bigelovii - Layia glandulosa - Mentzelia* spp. (Bigelow's tickseed - Whitedaisy tidytips - Blazingstar fields) Association**

Plagiobothrys nothofulvus or other similar *Plagiobothrys* are dominant and characteristic in spring seasons with good rainfall. Probably does not form mappable stands in the study area; most stands or other ecologically similar species (e.g., *Cryptantha* or *Pectocarya* sp.) are part of other alliances such as *Eschscholzia, Bromus-Schismus, Lasthenia*, etc...
2315 = *Plagiobothrys nothofulvus* (Popcorn flower fields) Alliance (not mapped and not inventoried in study area)

37'. Stands characterized by native perennial bunch grasses such as *Nassella pulchra* OR completely dominated by non-native annual grasses (*e.g.*, *Bromus rubens, Schismus* spp.) or forbs (*e.g.*, *Brassica* sp., *Salsola* sp.) with little or no native component…

40. Stands dominated or characterized by perennial native bunch grasses or perennial forbs usually with a number of native and non-native annuals present (three choices below)…
2320 = California perennial grassland Group

One or more species of *Nassella* (=*Stipa*) spp. and/or *Melica* spp. is/are co- dominant in the herbaceous layer ….
2322 = *Nassella* spp. - *Melica* spp. (Needlegrass - Melic grass grassland) Alliance

Including: 2321 *Nassella* cernua (Nodding needle grass grassland) Association

2323 = *Nassella pulchra* (Purple needle grass grassland) Sub- Alliance (not mapped and not inventoried in study area)

Corethrogyne filaginifolia, Eriogonum elongatum, and/or *E. nudum* is/are co- dominant in the herbaceous layer…
2217 = *Corethrogyne filaginifolia - Eriogonum (elongatum, nudum)*
(Sand-aster – Perennial buckwheat fields) Alliance

40'. Stands strongly dominated by non-natives, lacking evenly distributed diagnostic native plants (usually <5% relative cover). Annual *Bromus, Schismus, Avena, Brassica* and other non-native herbaceous species are strongly dominant, with little regular cover of native herb species…
2330 = Mediterranean California naturalized annual and perennial grassland Group (and now some considered in G677 North American Warm Desert Ruderal Grassland) (four choices below)…

Hirschfeldia incana, Brassica tournefortii or *Sisymbrium irio* are locally prevalent dominants in an herbaceous layer (where shrubs <2% absolute cover and/or not evenly distributed). Usually on sandy substrates, often near road cuts or in clearings, fallow fields, large washes, riverbeds, etc. *B. tournefortii* casts a straw colored signature over sandy sites such as in Dunn, East of Dale Lake, etc. Can model for exotic class 2 in these settings where *Larrea tridentata* or other alliances still prevail….
2331 = *Brassica tournefortii - Malcolmia africana*
(Upland desert mustards) Semi-natural Stands

Bromus rubens (B. madritensis ssp. *rubens)* and/or *Schismus arabicus or S. barbatus* with the highest percent cover of non-native grasses present, generally strongly dominant; without even shrub layer or without even distribution of native desert annual herbs or grasses. These stands are usually the result of multiple short interval fires or clearings in desert scrub such as *Larrea tridentata – Ambrosia dumosa*; *Schismus* tends to dominate on sandier or siltier substrates than *B. rubens* and tends to not take up as much area as *B. rubens* stands (not usually mappable)…
2332 = *Bromus rubens - Schismus (arabicus, barbatus*) (Red brome or Mediterranean grass grasslands) Semi-natural Stands (not mapped and not inventoried in study area)

Lolium perenne or *Pennisetum* spp. dominant…
2333 = *Lolium perenne* (Perennial rye grass fields) Semi-natural Stands
(not mapped and not inventoried in study area)

2334 = *Pennisetum setaceum* (Fountain grass swards)

Semi-natural Stands (not mapped and not inventoried in study area)

29'. Vegetation not adapted to Mediterranean climate. Either typically cooler winters (more continental climate), moister summers (ameliorated locally by cool, shady slope exposures, or surface and subterranean runoff), or both. Stands are higher in the mountains or more strictly associated with cooler and moist to wet microsites…

3000 = TEMPERATE AND BOREAL SHRUBLAND AND GRASSLAND SUBCLASS (3000)

41. Stands are upland grasslands, herblands, or shrublands not associated with areas of moisture accumulation that could be considered marshes, wet meadows, or swales… **3100 = Western North American Temperate Grassland and Meadow Macrogroup MG048**

42. Stands strongly dominated (>80% relative cover) by non-native annual cool season cheat grass (*Bromus tectorum*) or by *Bassia* spp. and/or *Salsola* spp. (with two choices below)…

3110 = Vancouverian and Rocky Mountain naturalized annual grassland Group (now considered part of G600 Great Basin & Intermountain Ruderal Shrubland & Grassland Group)

3111 = *Bromus tectorum - Taeniatherum caput-medusae* (Cheatgrass - Medusahead grassland) Semi-natural Stands
[Not mapped and not inventoried in study area, but some mixes with *B. trinii* and *B. rubens* were seen in the Antelope Valley. *Note: B. tectorum* is very common as an understory of chaparral and *Juniperus* stands in the higher and cooler margins of the study area and likely to form stands if subjected to repeat short interval fires].

3112 = *Isatis tinctoria - Salsola tragus* (Dyer's woad - Prickly Russian thistle Ruderal annual forb meadow) Semi-natural Stands
Bassia hyssopifolia, B. scoparia, Salsola kali, Salsola tragus, or a related non-native invasive forb taxon dominant.

42'. Stands dominated by evergreen or deciduous shrubs or by native bunchgrasses…

43. Native perennial grasses such as *Poa secunda, Elymus elymoides,* or *Elymus multisetus* or sedge *Carex douglasii* (the only certain members of this group locally) are diagnostic and evenly distributed although may be co-dominant with non-native annuals (three choices below)…

Poa secunda, Elymus multisetus, and/or *Elymus elymoides* is dominant or co-dominant with *Bromus rubens* on clayey soils on both flats and north- facing hillslopes along with *Allium* spp., *Claytonia parviflora, Erodium cicutarium, Dichelostemma capitata, Trifolium willdenovii* and/or other herbs.

The primary member of this group in the mapping area is the *P. secunda* but other grasses may occur as dominant or co-dominant. Occurs restricted to the northwestern part of the study area such as stands on Tejon Ranch, just across fence-line in west Antelope Valley, and scattered in the southern Sierra Nevada. If *Eschscholzia* is seen, always label as *Eschscholzia*, but in other areas that have high natives and no obvious wildflower fields, one might expect this alliance, especially following fire and removal of shrub cover on north-facing slopes as far east as Ord Mountain area…

Aristida purpurea, Elymus elymoides and/*or Poa secunda* dominant in dry meadows and post-burn slopes…
3120 = Western dry upland perennial grassland Group
3122 = *Aristida purpurea - Elymus elymoides - Poa secunda* (Purple three-awn - Squirreltail - Curly blue grass grassland) Alliance (not mapped in study area)

Carex douglasii or *Muhlenbergia richardsonis* is dominant, in wet to moise, often alkaline meadows in higher elevations…./.
3220 = Western Cordilleran montane moist graminoid meadow Group
3221 = *Poa secunda – Muhlenbergia richardsonis – Carex douglasii (*Onesided blugrass - Mat muhly - Douglas' sedge meadows) Alliance (not mapped and not inventoried in study area)

43’. Shrubs dominant…

44. Winter deciduous shrubs dominant and characteristic…
3200 = Western Cordilleran Montane Shrubland and Grassland Macrogroup MG049 (now called M049 Southern Rocky Mountain Montane Grassland & Shrubland)
3210= Western Cordilleran montane deciduous scrub Group (now called G275 Northern Rocky Mountain Montane-Foothill Mesic Deciduous Shrubland Group)

45. *Ceanothus integerrimus* is dominant in the shrub, or co-dominant with other chaparral shrubs, often growing after recent fires in mid montane sites. Seen only in small stands (<5 acre) in the southern Sierra Nevada…

3212 *Ceanothus cordulatus - Ceanothus integerrimus* (Mountain whitethorn - Deer brush chaparral) Alliance
Including the 3213 = *Ceanothus integerrimus* (Deer brush chaparral) Association

45'. *Ribes quercetorum* is the dominant shrub in the canopy, often growing clonally that resprouted recently after fire on steep or concave north facing slopes. Seen only in small stands (< 1 acre MMU) in the foothills of Liebre Mountains next to *Ericameria nauseosa, Quercus lobata* and *Q. douglasii* stands …
3211 = *Ribes quercetorum* (Oak gooseberry thickets) Provisional Alliance

44'. Stands characterized by a moderately open to intermittent cover of sclerophyll shrubs of *Quercus* spp. or of *Ceanothus greggii* over a shorter layer of subshrubs with at least some presence of xerophylls such as *Opuntia, Cylindropuntia, Yucca* spp., etc. and presence of various drought deciduous species such as *Ericameria* spp., *Encelia actoni,* etc., which have desert affinities. True Mediterranean California chaparral species such as *Adenostoma, Arctostaphylos*, *and Ceanothus* (other than *C. greggii*), and others are lower in cover or absent, yet stands of the California Chaparral Macrogroup can be adjacent...
D061 Western N. American Interior Sclerophyllous Chaparral Shrubland
3300 = Warm Interior Chaparral Macrogroup MG051
3310 = Western Mojave and Western Sonoran Desert borderland chaparral Group

46. *Quercus cornelius-mulleri*, *Q. john-tuckeri,* or *Q. turbinella* dominant or co-dominant in the shrub canopy, and is ≥4% cover; however *Juniperus californica* can be almost as high in cover. Note: These two desert scrub oak species, along with the common other scrub oak species *Q. berberidifolia* (map code 2132) can be difficult to distinguish and serve similar ecological roles. If two or more scrub oaks are present (e.g., in the Cajon Pass area for *Q. berberidifolia* and *Q. john-tuckeri*) use the sum of their absolute covers and key to the predominant species.…

47. *Quercus john-tuckeri, Q. cornelius-mulleri, Q. palmeri* or *Q. turbinella* is the dominant oak as a low tree or shrub. Three choices below:

Quercus john-tuckeri is dominant or it intermixes with similar or higher cover than *Juniperus californica*. A variety of shrubs, such as *Arctostaphylos glauca,*

Ceanothus cuneatus, Cercocarpus betuloides, Garrya flavescens, Ericameria linearifolia, E. cooperi, Adenostoma fasciculatum, Eriogonum fasciculatum, etc., may be present at low cover in the shrub layer…
3312 = *Quercus john-tuckeri* (Tucker oak chaparral) Alliance

Quercus cornelius-mulleri is dominant or co-dominant, and evenly distributed across the stand with *Eriogonum fasciculatum, Ericameria linearifolia, E. teretifolia,* and/or *Yucca schidigera.*
Stands only occur around Morongo Valley and the town of Joshua Tree, typically on north- facing slopes. They often mix with stands of *Juniperus californica* or *Coleogyne ramosissima*. If *J. californica* and *Quercus cornelius-mulleri* are co-dominant, and stands contain some *C. ramosissima*, then key to *J. californica* alliance…
3314 = *Quercus cornelius-mulleri* (Muller oak chaparral) Alliance

Quercus turbinella is dominant as a low tree or shrub, intermixing with upland species such as *Eriogonum wrightii* and *Rhus trilobata*, or riparian species such as *Baccharis sergiloides….*
3322= ***Quercus turbinella* (Sonoran scrub oak chaparral) Alliance** (not mapped and not inventoried in study area)

47’. *Quercus palmeri* is the dominant as a low tree or shrub… **3313 = *Quercus palmeri* (Palmer oak chaparral) Association in the *Quercus john-tuckeri* Alliance**

46’*. Ceanothus greggii* is dominant or co-dominant in the stand with *Fremontodendron californicum* or other shrubs. Stands have been identified from the study area in the margins of the Transverse Ranges and southern Sierra Nevada …

3316 = *Ceanothus greggii - Fremontodendron californicum* (Cup leaf ceanothus - Flannelbush chaparral) Alliance

Including *Ceanothus greggii* (=*Ceanothus vestitus, C. perplexans)* dominant typically in post-burn areas in mid to upper elevations of desert and desert transition…

3311 = *Ceanothus greggii (var. vestitus, perplexans)* (Cup leaf ceanothus chaparral) Association (not mapped and not inventoried in study area)

41'. Stands dominated by tall to short herbs and graminoids in wet to moist meadows, seasonal ponds, vernal pools, or in regularly to episodically flooded bottomlands or depressions (including saline and alkaline depressions such as playas). Due to the proximity of fresh and saline or alkaline water sources in the study area it is possible for freshwater and salt or alkaline stands to be immediately adjacent to one another. This makes mapping of wetland complexes such as near large playas, rivers, or artificial sources such as water treatment plants, sometimes problematic…

48. Stands restricted to freshwater seeps, marshes, and wet meadows. Stands are of three main types; 1) dominated by tall emergent perennial herbs such as reeds, tules, and cattails found in permanently wet soil or standing water; 2) stands dominated by smaller mostly annual herbs of ephemeral ponds and swales, drying by mid-growing season, and 3) stands dominated by mid-sized perennial wetland graminoids such as rushes (*Juncus* sp.)…

2.C.5 Temperate & Boreal Freshwater Wet Meadow & Marsh D031 Western North American Freshwater Wet Meadow & Marsh

Type 1 falls within the following macrogroup and group:
3400 = Western North American Freshwater Marsh Macrogroup MG073 (now called Warm Desert Freshwater Shrubland, Meadow & Marsh MG076) 3410 = Arid West freshwater emergent marsh Group
This type has three main mappable categories, listed below:

Phragmites australis ssp. *americanus*, the tall stoloniferous wetland grass, dominates the stand. Most stands are small and occur adjacent to permanent water sources such as springs, flowing streams and rivers. Most are below mappable size for this project, with the exception of some stands along the Colorado River and near the Salton Sea. Hybrids between the native races of the American Southwest and non-native Eurasian races are occurring in some areas and make conservation prioritization difficult. Most stands in isolated wetlands and along ditches appear native…

3416 = *Typha* (*angustifolia, domingensis, latifolia*) (Cattail marshes) Alliance

Including the **3411 = *Phragmites australis* ssp. *americanus* (Common reed marshes) Association**

Schoenoplectus spp. (tall bulrushes) dominate the stand. Small, but often mappable stands occur in all areas of the study where ponds and sluggish permanently flowing water exist. Note: two or more alliances are treated within this mapping unit. It is not possible to map them individually. They have similar ecologies. *S*. acutus occurs in fresh or brackish water; *S. californicus* appears more regularly at edges of open water; and *Bolboschoenus maritimus* (formerly *Scirpus m*., and not represented by a specific map code in this project), the alkali bulrush, occurs in brackish to salty or alkaline water near or on playas such as Coyote Lake and the Owens Valley…

3412 = *Schoenoplectus (acutus, californicus)* (Hardstem bulrush, California bulrush marsh) Alliance including the below:

3413 = *Schoenoplectus acutus* (Hardstem bulrush marsh) Association
3414= *Schoenoplectus californicus* (California bulrush marsh) Association

Typha spp. dominate stands in the tall herb layer. Most stands growing within water with slightly alkaline or saline chemistry are *T. domingensis*. Stands of
T. latifolia have only been inventoried in fresh water at Lost Lake (Cajon Pass region)…
3416 = *Typha (angustifolia, domingensis, latifolia)* (Cattail marshes) Alliance

Type 2 is probably restricted to the Antelope Valley region and is likely present but due to inaccessibility, no certain stands were inventoried. Three polygons (all privately owned and not accessible) are mapped as vernal pools or swales in this area. If accurate, these would likely be similar to those of the southern San Joaquin Valley or the inner south Coast Ranges, farther west and outside of the study area. Landscapes with pools and swales near Rosamond and north of Lancaster, which contain an even distribution of low cover *Atriplex confertifolia* over *Lasthenia* and other native herbs are keyed in the *A. confertifolia* alliance (couplet 67)…
3500 = Western North America Vernal Pool Macrogroup MG074 3510 = Californian mixed annual/perennial freshwater vernal pool/swale/plain bottomland Group

One particular alliance that may possibly occur in the area is characterized by the summer or late spring flowering *Deinandra fasciculata*. No verified occurrences of this type have been seen in the area…

3511 = *Deinandra fasciculata* (Clustered tarweed fields) Alliance (not mapped and not inventoried in study area)

Type 3 is composed of mid-sized grasses and graminoids, characteristic of moist to wet meadows and marsh edges with fresh to slightly alkaline or saline water chemistry. Most stands are small, although some meet MMU requirements and have been mapped.
3600 = Western North America Wet Meadow and Low Shrub Carr Macrogroup MG075 (now called Western North American Montane & Subalpine Wet Shrubland & Wet Meadow)
3610 = Californian warm temperate marsh/seep Group (four choices below)...

Juncus arcticus, the dark brownish-green rhizomatous rush, is dominant and characteristic. Stands may include similar to lower cover of other native and non-native herbs, but *J. arcticus* is prevalent throughout. Largest mappable stands occur in the Silverwood Lake area and around seeps and springs such as on the west side of Coyote Lake and Paradise Springs…
3611 = *Juncus arcticus (var. balticus, mexicanus)* (Baltic and Mexican rush marshes) Alliance

Leymus triticoides, the pale green creeping grass, or *Leymus cinereus* characterizes the stands or are co-dominant with other grasses such as *Distichlis spicata* and/or *Sporobolus airoides*. Stands are usually too small to map and often occur adjacent to edges of permanent wetlands (when the group 3610 or Macrogroup 3600 categories are acceptable) or riparian woodland as near Victorville or in the Owens Valley. May be saline, alkaline, or fresh water. Usually in slightly drier conditions than *Juncus arcticus*… **3612 = *Leymus cinereus - Leymus triticoides* (Ashy ryegrass - Creeping rye grass turfs) Alliance**

Muhlenbergia rigens, the tufted perennial grass, characterizes the stand. Small stands have been seen within the study area, including along the upper Mojave River drainage upstream from Silverwood Lake...
3613 = *Muhlenbergia rigens* (Deer grass beds) Alliance (not mapped / not inventoried in study area)

Mimulus guttatus or related *Mimulus* species, a wetland forb, is dominant or characterizes stands along with other herbs such as *Juncus bufonius, Nasturtium officinale,* and *Urtica dioica*, along seeps…
3614 = *Mimulus (guttatus)* (monkey flower seeps) Alliance

48’. Stands restricted to marshes or episodic wetlands that concentrate salts or alkaline minerals. Many stands are too small to effectively be mapped...
2.C.6 Salt Marsh.

49. Stands are wet, flooded, or at least moist throughout the growing season and support dense herbaceous growth…
3700 = Warm Semi-Desert/Mediterranean Alkali–Saline Wetland Macrogroup MG083
3710= Southwestern North American alkali marsh/seep vegetation Group

50. *Juncus* spp. (rushes), *Schoenoplectus, Scirpus,* or *Bolboschoenus* (bulrushes) dominate the stands (four choices below)…

Vegetation of saline or alkaline marsh vegetation dominated by densely tufted *Juncus cooperi*, or co-dominated by *J. cooperi* and *Distichlis spicata*. Most stands occur to the east of our study area in the Death Valley-Soda Lake Trough in the eastern Mojave Desert…
3726 = *Distichlis spicata* (Salt grass flats) Alliance

Including the 3714 = *Juncus cooperi* (Cooper’s rush marsh) Association (not mapped in study area)

Schoenoplectus americanus, a vivid green triangular stemmed bulrush, forms stands in moist to flooded borders of saline or alkaline marshes in basins or near playas, such as China Lake. Large stands also mix with *Bolboschoenus maritimus* in seeps below the water treatment storage ponds north of Lancaster (edge of Edwards Air Force Base)…
3718 = *Schoenoplectus americanus* (American bulrush marsh) Alliance

Bolboschoenus maritimus dominant or co-dominant in inland marshes in areas with alkali, brackish settings, such as in Owens Valley. Stands of alkali bulrush (*Bolboschoenus maritimus* or *B. robustus*) also occur in a few areas, including Harper Lake Wildlife Observation area, the center of Coyote Dry Lake, and below the Lancaster waste water ponds on the border of Edwards Air Force Base. Currently these are being treated as members of a generic bulrush mapping unit …
3715 = Bolboschoenus maritimus – Schoenoplectus americanus
(Salt marsh bulrush – American bulrush marshes) Mapping Unit

Including 3717 = *Bolboschoenus maritimus* (Salt

marsh bulrush marsh) Alliance

Scirpus nevadensis (= *Amphiscirpus nevadensis*) is dominant, co- dominant or characteristically present with *Distichlis spicata* in inland alkaline marshes, such as in Owens Valley…
3726 = *Distichlis spicata* (Salt grass flats) Alliance

Including *Distichlis spicata - Scirpus nevadensis* (Salt grass - Nevada Bulrush) Alkaline Association

Eleocharis rostellata is dominant or co-dominant with *Juncus* spp. in inland alkaline marshes, such as in Owens Valley…
3719 = *Eleocharis (palustris, rostellata)* (Alkaline spikerush marsh) Alliance

50'. Stands characterized by *Anemopsis californica, Spartina gracilis, Sporobolus airoides, Muhlenbergia asperifolia,* or *Distichlis spicata.* Stands in moist meadows and flats often associated with alkaline water and stands of *Distichlis spicata, Schoenoplectus americanus*, or *Juncus arcticus*, but none of these species are dominant. Stands are small and uncommon, with none known to be large enough to be mapped in this study. Individual stands occur in the vicinity of Victorville near the Mojave River narrows some in actively grazed irrigated meadows (four choices below)…

Anemopsis californica, Solidago confinis, or *Solidago spectabilis* dominant or co-dominant with other herbs and graminoids such as *Juncus mexicanus…*
3713 = *Anemopsis californica - Helianthus nuttallii - Solidago spectabilis* (Yerba mansa - Nuttall's sunflower - Nevada goldenrod meadow) Alliance

Sporobolus airoides, Muhlenbergia asperifolia, Puccinellia nuttalliana, and/or *Spartina gracilis* occur as dominants or co-dominants in stands, such as in the Owens Valley, and near Hwy 14 and west side of Edwards Air Force Base. Sometimes *Bassia* and/or *Salsola* may be co-dominating with the native perennial grasses, and still be in this alliance. Stands often adjacent to or in a matrix with *Allenrolfea occidentalis, Atriplex torreyi, Ericameria nauseosa* and/or *Sarcobatus vermiculatus* stands in the Owens Valley and adjacent to *A. confertifolia* stands in the central Mojave. Shrubs often present, including *A. torreyi, Ericameria nauseosa,* and *Sarcobatus vermiculatus,* where the shrubs are scattered or evenly distributed but herbs are at least 3X

the cover of the shrubs (regardless of the amount of total cover)…

3712 = *Sporobolus airoides - Muhlenbergia asperifolia - Spartina gracilis* (Alkali sacaton - Scratchgrass - Alkali cordgrass meadow) Alliance

Includes the following association where *Spartina gracilis* is dominant or co-dominant in stands…

3711 = *Spartina gracilis* (Alkali cordgrass meadow) Association

Although formally considered part of the next group (3720 = Southwestern North American salt basin and high marsh Group), *Distichlis spicata,* the short rhizomatous salt grass, is likely to be seen adjacent to episodically flooded basins, springs, playas, and salt marshes, sometimes without visible salt deposits on the surface.

Mappable stands occur at Harper Lake, Owens Valley, and several other sites in the study area…

3726 = *Distichlis spicata* (Salt grass flats) Alliance

49'. Stands usually restricted to alkali or salt basins, margins of springs, or river terraces where salt deposits or alkali deposits are often present…

3720 = Southwestern North American salt basin and high marsh Group

51. Stands are dominated by succulent stemmed shrubs or herbs in the Chenopod family. Leaves can be scale-like and inconspicuous. Restricted to salty basins that are often seasonally inundated or saturated (two choices below)…

Allenrolfea occidentalis has the highest cover (often >2% absolute cover) in the shrub canopy OR has similar cover to *Suaeda moquinii*, *Atriplex confertifolia,* or *A. canescens.* Occurs on saline playas and margins of salt pannes. Can occur in hummocks that are widely spaced on relatively flat playas. Stands may also form borders around edges of playas on edges of stabilized dunes. In general, stands in the Mojave and Colorado deserts have small, low, and widely to intermittently spaced shrubs, but stands at China Lake may be denser and have a *Distichlis* understory. If herbs are present, they are <3 x the cover of the shrubs…

3721 = *Allenrolfea occidentalis* (Iodine bush scrub) Alliance

The annual pickleweed, *Salicornia depressa,* is the dominant herb. No other species approaches cover of *S. depressa*. In winter, skeletons of the annual plants are usually visible to

confirm identification. The only stands known are at Harper Lake, probably adjacent to *Suaeda moquinii* and enhanced (trenched and watered) *Bolboschoenus* stands. Based on the imagery used for this project, stands were not mappable…
3727 = *Salicornia depressa* (Pickleweed flats) Herbaceous Alliance
(not mapped and not inventoried in study area)

51'. Stands are dominated by non-succulent, shrubby members of the Chenopod family or by other species of shrubs or herbs without succulent stems. Stands are rarely inundated or briefly so, as compared to above…

52. Stands dominated or characterized by shrubby members of the genus *Atriplex* (three choices below)…

Stands dominated (typically >60% relative cover) by *A. lentiformis* or
A. torreyi (= A. lentiformis ssp. *torreyi*). Stands are relatively uncommon and are of two kinds. The tall, broad, bushy form of *A. lentiformis* occurs on river terraces adjacent to *Populus fremontii* stands near Victorville below the Mojave River narrows mixed with *A. polycarpa* and *A. canescens*. Small stands of *A. torreyi* (Nevada saltbush) occur on the beds of dry lakes and valleys. Mapping sites of *A. torreyi* might be in Edwards, Lucerne, Koehn, or perhaps China lakes, locally, while stands are well-established in Owens Valley. Charlton (in Lichvar et al. 2004) states: [Nevada] saltbush is strongly associated with specific environments and occurs as pure stands in clay washes and on the playa edge where drainages empty out into the playa. [Nevada] saltbush is commonly associated with shadscale or spinescale in communities adjacent to washes in or near playas.

A. torreyi is usually associated with *Suaeda moquinii, Ericameria nauseosa,* and/or *Atriplex canescens.* If *Suaeda moquinii* is dominant to co-dominant, key to *Suaeda.* Charlton (at Edwards AFB) has a description of a *Suaeda–Atriplex torreyi* Shadscale Association. If *E. nauseosa* is co-dominant, key to *E. nauseosa.*
Strong dominance by *A. confertifolia,* key to *A. confertifolia*...
3722 = *Atriplex lentiformis* (Quailbush scrub) Alliance

Atriplex spinifera (spinescale saltbush) dominates or co-dominates with *A. polycarpa, Larrea tridentata,* or *Ambrosia dumosa* in the shrub canopy. When *A.*

confertifolia is co-dominant with *A. spinifera,* key to *A. confertifolia.* Stands may include with *Artemisia spinescens* and *Lepidium fremontii* near playa lakebeds, where either of these additional species may co-dominate. *A. spinifera* prefers fine- textured silty or clay soils that are not strongly alkaline or saline; shrubs are typically evenly-spaced with small gray clay lenses scattered throughout, and not highly reflective whitish pannes.

Occasionally, stands occur in less silty and sandier soils as near Hinkley and Helendale (west of Barstow) where one would normally predict *A. polycarpa*. Stands may be extensive or can occur in a fine matrix with *Ambrosia dumosa* (present or co-dominant)*, Atriplex polycarpa*, and *Krascheninnikovia lanata* (e.g., in Four Corners area north to Cuddyback Lake). Herbs may have open to intermittent cover and include *Bromus rubens, Erodium cicutarium* and *Lasthenia*. *Lasthenia gracilis* or *Coreopsis calliopsidea* may be dominant annuals in spring. *A. spinifera* often occurs on hydrophobic soils that saturate to only a few centimeters during the rainy season. Soils remains moist throughout spring. These conditions favor the development of the blacktop form of cryptobiotic crust. Sensitive species observed in this community include Mojave spineflower *(Chorizanthe spinosa)* and crowned onion *(Muilla coronata)…*

3723 = *Atriplex spinifera* (Spinescale scrub) Alliance

Stands are dominated by the mid-sized shrub *Atriplex parryi.* Stands are mappable at China Lake and Owens Lake where they occur in alkaline basins on fine textured soils just upslope from *Allenrolfea occidentalis* stands or down slope from the *Atriplex confertifolia* stands. Small stands (not mappable) have been noted within larger *A. confertifolia* stands such as at Coyote Lake, and with *A. spinifera* near California City…

5511 = *Sarcobatus vermiculatus* (Greasewood scrub) Alliance

Including the 3729 = *Atriplex parryi* (Parry's saltbush) Association

52'. Stands dominated by either the low subshrub *Frankenia salina*, the taller succulent leaved *Suaeda moquinii, Isocoma acradenia, Cressa truxillensis, Stutzia covillei* (= *Endolepis covillei*), and/or the low grass *Distichlis spicata* (five choices below)…

Frankenia salina is dominant or co-dominant in playas, alkaline depressions and alkali sinks with seasonally moist, poorly drained soils. *Atriplex* spp., *Cressa truxillensis,* and other species may be present. Stands are part of the high marsh vegetation in southern California; inland they occur on alkaline flats. They are often intermixed with *Bassia, Salsola*, or other alkali-tolerant weeds.
Stands of mappable size are unusual in the study area; e.g, relatively uncommon at Harper and China Lakes, and often < 1 acre in size… **3724 = *Frankenia salina* (Alkali heath marsh) Alliance**

Suaeda moquinii characterizes stands, typically with ≥2% cover (it may have lower cover in shrub stands with a sparse canopy) where it is evenly distributed with no other native shrub having greater cover. If *S. moquinii* and *Atriplex canescens, A. polycarpa,* or *A. torreyi* co-dominate, the alliance is *Suaeda*. If *S. moquinii* and *Allenrolfea occidentalis* co-dominate, the alliance is the latter. Where wind-blown salts are deposited, *S. moquinii* and *Kochia* may co-occur (China and Rosemond Lakes), and these stands are mapped as *S. moquinii* alliance - there is no *Kochia* alliance defined yet. Stands typically occupy strongly alkaline playas, usually with distinct salt deposits on the soil surface, but may occur in upland areas adjacent to playas (e.g., Lucerne Lake). Stands often create fine-scale drainage patterns in cracks in lake beds. They are mapped as low cover (1- 5% shrub) over broad areas in such situations (as at Coyote Lake)…
7411 = *Suaeda moquinii - Isocoma acradenia* (Bush seepweed - Alkali goldenbush scrub) Alliance

Isocoma acradenia is dominant on flat to gentle slopes near salty margins of dry lakes and playas or on episodic alkaline outwash deposits from springs and seeps. Larger stands occur on western shore of Coyote Lake and some at China and Lucerne Lakes (they may not always be mappable due to small size and intermixing with *Atriplex confertifolia*, *A. parryi*, and *Suaeda moquinii* stands)…
7411 = *Suaeda moquinii - Isocoma acradenia* (Bush seepweed – Alkali goldenbush) Alliance Including
3728 = *Isocoma acradenia* (Alkali goldenbush) Association

Distichlis spicata with ≥2% cover and typically dominant or co- dominant in the herb layer; though, non-native

herbs may be present with moderately higher cover. Soils are often deep, alkaline or saline, and poorly drained. A variety of native and non-native forbs and grasses may be present. *Distichlis spicata* is restricted to moderate to strongly alkaline and saline soils. Large (>5 ha, 12 ac) stands do occur at Harper Lake (the south shore margin has a stand >100m (300ft) wide for >4 ha or 10 acres). Stands are associated with alkali springs, playa and panne margins…

3726 = *Distichlis spicata* (Salt grass flats) Alliance

Distichlis spicata, Cressa truxillensis, Stutzia covillei (= *Endolepis covillei*), and/or other forbs such as *Plagiobothrys stipitatus, Sesuvium verrucosum,* or *P. parishii* occur on vernally moist clay soils, such as in small patches in Owens Valley and Cronese Lake areas…

3512 = *Cressa truxillensis – Distichlis spicata* (Alkali weed – Salt grass playas and sinks) Alliance

Including the *Cressa truxillensis – Endolepis covillei* (Alkali weed - Coville's endolepis) Provisional Association

28'. Vegetation is defined by scrubs and occasional grasslands within the warm and cold desert of California. Diagnostics usually exhibit characteristics of xeromorphy and are naturally distributed in scrubs and grasslands with lower overall cover than mesomorphic (class 1000 or 2000) vegetation…

SEMI-DESERT CLASS

53. Principal indicator species are adapted to very hot dry summers and mild winters, characteristic of the majority of the lower to mid elevations of the Mojave, Sonoran and Colorado deserts. The main indicator genera include: *Ambrosia, Acacia, Chilopsis, Encelia, Larrea, Hyptis, Senna, Parkinsonia, Olneya, Ferocactus, Psorothamnus,* and *Krameria*. Stands with emergent *Yucca brevifolia* over higher, more uniform cover of sclerophylls (*e.g.*, *Fremontodendron, Adenostoma,* or shrubby *Quercus*) key to chaparral. If stands do not meet these criteria, please go to couplet 52'.

4000 = WARM SEMI-DESERT SCRUB AND GRASSLAND SUBCLASS

54. Vegetation of the lower slopes, fans and small sheet flow areas of the warm desert parts of the state, but not of well-defined washes or arroyos with clear banks and channels. Dominated or co-dominated by small to moderate sized shrubs (or perennial grasses) of the genera *Ambrosia, Encelia, Larrea, Senna, Parkinsonia, Olneya, Ferocactus, Prunus fasciculata, Simmondsia chinensis, Psorothamnus* and *Krameria.* If *Yucca*, *Salazaria, Grayia,* or *Ephedra nevadensis* are present, they have equal or lower cover and are overshadowed by members of the

aforementioned genera. Winters may experience short frosts, but generally are not subject to persistent freezes and snow accumulation…
4100 = Mojavean–Sonoran Desert Scrub Macrogroup MG088

55. *Agave deserti, Carnegiea gigantea, Parkinsonia microphylla, Prunus fremontii,* and *Simmondsia chinensis* occur as dominant or codominant plants in the shrub layer. Stands may have be intermixed and highly variable.
4150 = Arizonan upland Sonoran desert scrub Group

56. *Carnegiea gigantea* and/or *Parkinsonia microphylla* characteristically present and usually >2% cover. Stands are restricted in California to the Whipple Mountains…
4152 = *Carnegiea gigantea – Parkinsonia microphylla – Prosopis velutina*
(Saguaro – foothill palo verde – velvet mesquite desert scrub) Alliance

56’ Shrubs other than *Carnegiea* and *Parkinsonia microphylla* dominant or codominant including *Prunus fremontii, Simmondsia chinensis,* and *Tetracoccus hallii.* (Three choices below)…

Agave deserti dominant or co-dominant in the shrub layer. Stands occur in desert transition, often on alluvial flats and lower alluvial to colluvial slopes… **4154 = *Agave deserti* (Desert agave scrub) Alliance**

Prunus fremontii dominant or co-dominant in the shrub layer. Stands occur in desert transition, often on north-facing alluvial slopes…
4153 = *Prunus fremontii* (Desert apricot scrub) Alliance

Simmondsia chinensis dominant or co-dominant with other shrubs including *Ambrosia* spp., *Eriogonum fasciculatum, Cylindropuntia* spp., *Viguiera* spp., and various others. Stands occur in desert transition…
4155 = *Simmondsia chinensis* (Jojoba scrub) Alliance

55’. Stands not as above. Dominated or co-dominated by small to moderate sized shrubs (or perennial grasses) of the genera *Ambrosia, Cylindropuntia, Encelia, Larrea, Ferocactus,* and *Krameria…*
4110 = Lower bajada and fan Mojavean–Sonoran desert scrub Group

57. *Ambrosia dumosa* covers ≥2% (rarely 1% in very sparse stands) of a single stand and exceeds any other shrub in cover. Stands lack significant cover of *Larrea tridentata* or *Larrea* cover is patchy and not uniformly distributed and ≤2% absolute cover and/or *Ambrosia*

dumosa > 3 times the cover. When *Kraschenninnikovia lanata, Ericameria cooperi, Tetradymia spp.,* or *Eriogonum fasciculatum* (but not *Grayia spinosa,* or *Atriplex spinifera*) are co-dominant they fall within the *Ambrosia dumosa* alliance. Stands are either on uplands with relatively fine-textured soil or in active washes or terraces adjacent to medium to large washes. They also may occur on steep slopes with neutral or southerly exposures (but not too bouldery). In the West Mojave (especially the northwestern portion of the mapped area) stands often result from fire or clearing of *Larrea* in formerly mixed *Larrea tridentata – Ambrosia dumosa*. Many stands commonly occur mixed with *Kraschenninnikovia lanata, Grayia spinosa, Ambrosia salsola, Ericameria cooperi*, and other species of "bathtub ring" shrubs above *Atriplex spinifera* or *A. polycarpa* and below *Larrea tridentata – Ambrosia dumosa* of mid- or upper fans…

4111 = *Ambrosia dumosa* (White bursage scrub) Alliance

57'. *Ambrosia dumosa* may be present, either co-dominant with, or have less cover than *Atriplex* spp., *Larrea tridentata, Encelia farinosa, Viguiera parishii, Pleuraphis*, *Tidestromia oblongifolia,* or *Cylindropuntia* spp…

58. *Atriplex polycarpa* typically has the highest shrub cover, usually with ≥2% cover and >50% relative shrub cover. Scattered along broader washes and on adjacent terraces. May occur on playa edges, in washes through alkaline areas, or occasionally uplands with alkaline substrate. Stands can occur on broad flats, in washes, or on steep volcanic ravines and slopes. In this alliance, *Atriplex polycarpa* is dominant in the shrub canopy if these shrubs are present: *Ambrosia dumosa*, *A. salsola*, *Atriplex canescens*, *Chamaesyce polycarpa, Cleome isomeris, Isocoma acradenia*, and *Larrea tridentata*. If *Larrea tridentata* is co-dominant, key to the *Larrea tridentata* Alliance. Rarely, *A. dumosa* is co- dominant with *Atriplex* polycarpa and be a part of this alliance. Emergent *Prosopis glandulosa* trees may be present at low cover. If *A. spinifera* is co- dominant with *A. polycarpa* in a stand, key to *A. spinifera* Alliance…

4113 = *Atriplex polycarpa* (Allscale scrub) Alliance

58'. *Atriplex polycarpa* is not dominant, conspicuous or evenly spaced…

59. *Encelia farinosa* is dominant or co-dominant with *Ambrosia dumosa, Larrea tridentata, Cylindropuntia bigelovii,* and/or *C. munzii*….

60. *Cylindropuntia bigelovii* or *Cylindropuntia munzii*

typically co- dominant with *Encelia farinosa* in localized settings of the southern Mojave and Sonoran Desert including the Chocolate Mountains and Sacramento Mountains…
4124 = *Cylindropuntia bigelovii* (Teddy bear cholla patches) Alliance

60'. *Encelia farinosa* is dominant or co-dominant with *Larrea tridentata* and/or *Ambrosia dumosa.* (Two choices below)…

Encelia farinosa with ≥2% cover and no other species having equal or higher cover – though *Ambrosia dumosa* may occasionally be co-dominant. *Larrea tridentata* is absent or clearly sub-dominant. *Ambrosia dumosa* and *Fagonia laevis* have been noted as associated species. Stands occur on mid to upper (most exposed) hot and dark rocky substrate on south-facing slopes, of the southern or lowest elevation parts of the study area (as far north as Trona and Spangler Hills, south side of Alvord Mountains, Paradise Range, and south side of Sidewinder Mountains near Lucerne). Usually bordered by *Larrea tridentata – Encelia farinosa* Alliance on slightly less exposed slopes (lower or less steep adjacent slopes) and giving way to *Larrea tridentata – Ambrosia dumosa* Alliance on more neutral slopes…
4114 = *Encelia farinosa* (Brittle bush scrub) Alliance

Larrea tridentata and *Encelia farinosa* are both present and often in similar cover (broadly co-dominant), although when *E. farinosa* is sub-dominant to *L. tridentata,* then *Ambrosia dumosa* also has very low cover or is absent. *L. tridentata, E. farinosa,* and sometimes *A. dumosa* co-dominate, sometimes along with these other conspicuous or co-dominant warm desert rupicolous shrubs: *Pleurocoronis pluriseta, Viguiera parishii, Trixis californica*, and *Simmondsia chinensis.* Stands sometimes have *A. dumosa, Hyptis emoryi*, or *Acacia greggii* as a third co-dominant. Usually in rocky/bouldery uplands or on well-drained bajadas…
4118 = *Larrea tridentata* – *Encelia farinosa* (Creosote bush - Brittle bush scrub) Alliance

59'. Shrubs other than *Encelia farinosa, Cylindropuntia bigelovii* or *C. munzii* dominant or co-dominant including

Atriplex hymenelytra, Viguiera parishii, Cylindropuntia acanthocarpa, and/or *Larrea tridentata*...

61. *Larrea tridentata* is either co-dominant with *Ambrosia dumosa*, the sole dominant shrub, or is the sole indicator with other mixed shrub species. *Yucca* species are generally less than 1% and not evenly distributed…

Larrea tridentata and *Ambrosia dumosa* evenly distributed across the landscape and characteristic of stand. In combination, the two species clearly dominate when their covers are added. However, mapping aggregations sometimes take into account mixes of *L. tridentata* without *A. dumosa* or *A. dumosa* without *L. tridentata* if they occur in fine scale patches within broader *Larrea tridentata – Ambrosia dumosa* stands. *A. dumosa* is conspicuously present (≥1% cover) as a short shrub between evenly spaced *Larrea*. *A. dumosa* can have higher cover than *L. tridentata*. If *Encelia farinosa* is present, it is sub-dominant. *Yucca schidigera,* if present, is <1% cover or is unevenly distributed (if it has higher cover and/or evenly distributed, see the *Yucca schidigera* Alliance). *Atriplex polycarpa* can be co-dominant. Widespread on all but the hottest, rockiest, sandy, or alkaline areas of the middle and lower elevations. Do not expect this Alliance on old alluvial surfaces where *A. dumosa* tends not to grow. Instead, older alluvial fans with interfluves are typical of *Larrea tridentata* Alliance. Stands tend to occur on north-facing slopes at the lowest and hottest exposures, where south-facing slopes would be *Larrea tridentata – Encelia farinosa* or *Encelia farinosa*. Occurs on shadier, extremely dry, north-facing exposures in the Colorado Desert…

4115 = *Larrea tridentata* – *Ambrosia dumosa* (Creosote bush
- White bursage scrub) Alliance

Larrea tridentata is the dominant shrub with at least 2% cover (rarely 1% cover in stands with a very sparse shrub canopy) and is evenly distributed in the stand. *Ambrosia dumosa* and/or *Encelia farinosa* are clearly sub-dominant if present. Other associated shrubs may include *Krameria* spp., *Bebbia juncea*, *Ericameria teretifolia*, *Acamptopappus sphaerocephalus*, *Ephedra nevadensis* or

Cylindropuntia acanthocarpa…
4119 = *Larrea tridentata* (Creosote bush scrub) Alliance

61'. *Larrea tridentata* may be present but if so, at least one of the following shrubs is present in significant cover*: Tidestromia oblongifolia*, *Pleuraphis rigida* (actually a shrubby grass), *Brickellia desertorum, Tetracoccus hallii, Cylindropuntia acanthocarpa, Viguiera, Salazaria,* or *Yucca* with five choices below (note: these are all in different NVC groups/macrogroups than the above)…

The small, stellate-pubescent subshrub, *Tidestromia oblongifolia* rarely forms stands in the study area, has been inventoried east of this area. Or stands include with *Atriplex hymenelytra* with or without *T. oblongifolia.* Stands occur on sand ramps and dune aprons and lower bajadas in hot and very dry locations tending to have <5% perennial cover…
6111 = *Atriplex hymenelytra* (Desert holly scrub) Alliance Including 4121 = *Tidestromia oblongifolia - Atriplex hymenelytra* (Arizona honey sweet scrub - Desert holly scrub) Provisional Association (not mapped and not inventoried in study area)

Pleuraphis rigida is the dominant perennial species and can be considered in the same layer as commonly occurring shrubs such as *Larrea, Ambrosia dumosa, Ephedra trifurca,* or other species. Stands are often mixed with lower cover of other shrubs and found on sand ramps, dune aprons, stabilized dunes near playas, or wide washes adjacent to *Larrea tridentata-Ambrosia dumosa* stands. Sandy stands adjacent to freeways and disturbance often have a significant non-native component of *Brassica tournefortii, Schismus* spp, etc. Stands are not often separable from the *Larrea tridentata - Ambrosia dumosa* / *Pleuraphis rigida* Association, but are occasionally large enough to map in the far eastern portion of map area. The western-most occurrence of this type is west of Barstow near Hinkley…
4122 = *Pleuraphis rigida* (Big galleta shrub-steppe) Alliance

Viguiera parishii with ≥1 percent cover. No other

species with greater or equal cover, except for *Acacia greggii, Ambrosia dumosa, Eriogonum fasciculatum, Simmondsia chinensis, Pleuraphis rigida, Lotus rigidus, or Encelia actoni.* Usually on rocky slopes in areas with cobbles, boulders, and/or outcrops at low to mid elevations or, rarely, in washes. Occurs on northerly slopes of the Mojave and Sonoran Desert in California. Found just above the *Larrea tridentata – Ambrosia dumosa* Alliance or in washes in the east Mojave Desert. Found on bouldery, often granitic slopes in the southeast portion of study area and not found elsewhere. [Note: this shrub is usually non-descript to photointerpreters and tends to co-dominate with several shrub species]…

2221 = *Eriogonum fasciculatum - Viguiera parishii* (California Buckwheat - Parish's goldeneye scrub) Alliance Including the 4151 = *Viguiera parishii* (Parish's goldeneye scrub) Association

Cylindropunta acanthocarpa ≥2 percent cover and co-dominant often with other succulent species such as *C. echinocarpa, C. ramosissima, Ferocactus cylindraceus,* and *Opuntia basilaris* along with lower cover of other shrubs such as *Ambrosia dumosa, Eriogonum fasciculatum, Krameria erecta,* and *Yucca schidigera. Pleuraphis rigida* may also be present. Stands appear transitional between lower bajada scrub and mid- elevation mixed scrub, and they and may be present due to past disturbance…

4161 = *Cylindropuntia acanthocarpa / Pleuraphis rigida* (Buckhorn cholla / Big galleta grass scrub) Alliance

Brickellia desertorum occurs on steep, colluvial or boulder- strewn slopes of granitic or volcanic rocks or in rocky to sandy washes; usually with relatively large, but scattered shrubs. Often associates with *Ambrosia salsola, Ericameria teretifolia, Atriplex polycarpa,* and may be adjacent to *Larrea tridentata* or *Larrea tridentata – Ambrosia dumosa*. Appears to resprout or recolonize after fires, flooding, and other disturbance. Map when there are not enough other definitive shrubs of other alliances on boulders, recently burned slopes (grass carries the fires up into the rocks), or in washes…

7211 = *Ambrosia salsola – Bebbia juncea* (Cheesebush – Sweetbush scrub) Alliance Including the 4123 = *Brickellia desertorum*

(Desert brickellbush scrub) Association (not mapped and not inventoried in study area)

54’ Vegetation of well-defined desert washes that shows distinct changes in plant composition and/or cover from adjacent upland vegetation stands. These washes may be broad and many-channeled or narrow and contain one or a few channels. They may occur in hills, flow across moderate sloping fans, or have a barely discernable slope and meander across lower toeslopes or basins. Diagnostic species include *Ephedra (californica* or *trifurca), Lepidospartum squamatum, Ericameria paniculata, Ambrosia salsola, Prunus fasciculata, Brickellia incana, Artemisia tridentata* ssp. *parishii*, *Acacia greggii, Hyptis emoryi, Prosopis glandulosa P. pubescens*, *Chilopsis linearis*, *Psorothamnus spinosus*, *Parkinsonia florida*, and *Olneya tesota*...

4200 = Madrean Warm Semi-Desert Wash Woodland/Scrub Macrogroup MG092 [Note: there are many warm and cool desert alliance indicators that may occur in washes, including *Larrea tridentata, Ambrosia salsola, Salazaria mexicana, Lycium cooperi, Atriplex polycarpa, A. canescens,* etc. This macrogroup is defined based on a series of indicators which are largely diagnostic of washes. Although it does exclude other alliances with broad ecological tolerances, this does not by any means exclude other alliances from occurring in washes on occasion].

62. Vegetation of washes and dominated by, co-dominated by, or containing evenly distributed shrubs of the following species: *Ephedra (californica* or *trifurca), Lepidospartum squamatum, Ericameria paniculata, Ambrosia salsola, Prunus fasciculata, Brickellia incana, Artemisia tridentata* ssp. *parishii* or *Bebbia juncea*...

4210 = Mojavean semi-desert wash scrub Group

63. Vegetation either dominated or co-dominated by *Ephedra californica* or *Ephedra trifurca. Senna armata* and *Ambrosia salsola* may intermix with similar or even higher shrub cover. *Ephedra californica* is typically of broad, active washes of mid to upper bajadas and fans, and this species may be confused with the similar *Ephedra trifurca* of washes and sand dunes from Barstow eastward.

E. trifurca is characteristic of low dunes and sand-sheets in the Colorado Desert but generally attains higher cover than vegetation types in the lithomorphic class that includes sparsely vegetated dunes. Due to similar ecology, both species are treated together in this *Ephedra californica* alliance. Stands dominated by *Senna armata,* with either species of *Ephedra* intermixing as an evenly distributed and important shrub, are also currently placed in this alliance (new evidence, following the conclusion of the field work for this project, suggests *Senna armata* may be a separate type)…

4211 = *Ephedra californica - Ephedra trifurca* (California joint

fir - Longleaf joint-fir scrub) Alliance

63’ Vegetation not dominated or-co-dominated by *Ephedra californica* or *E. trifurca*…

64. Vegetation characterized by *Lepidospartum squamatum.* Stands are concentrated along washes on the eastern base of the San Bernardino, San Gabriel and southern Sierra Nevada. Usually in larger washes with regular flooding, the substrate texture is coarse sand to small cobbles to gravel. Stands rarely occur well out into the desert (except along the Mojave River) and are usually at the bases of mountains in arroyos or on upper fans. [Note: Compare with *Ericameria paniculata, Ambrosia salsola, and Chilopsis linearis* alliances]…
4212 = *Lepidospartum squamatum* (Scale broom scrub) Alliance

64’ Vegetation not dominated by *Lepidospartum squamatum* but instead is dominated or characterized by *Ericameria paniculata, Prunus fasciculata, Brickellia incana, Fallugia paradoxa, Ambrosia salsola, Artemisia tridentata* ssp. *parishii* or *Bebbia juncea* (seven choices below)...

Ambrosia salsola characterizes stands and typically has the highest cover (usually >50% relative cover in dominant shrub layer). *A. salsola* may mix with equal or somewhat higher amounts of *Senna armata* or with *Larrea tridentata* in washes and still be considered this alliance (however, new evidence, following the conclusion of the field work for this project, suggests *Senna armata* is a separate association in the northwest Mojave, found in the Spangler Hills and the vicinity of Red Rock Canyon State Park). If *A. salsola* is co-dominant with *Eriogonum fasciculatum*, key to the *E. fasciculatum* Alliance. Stands of washes or disturbed uplands. Upland stands are usually associated with fire, clearing, or other disturbance in former *Larrea tridentata-Ambrosia dumosa*, *Juniperus californica, Yucca schidigera, Coleogyne ramosissima* or other upland vegetation. Most non-fire related stands of *A. salsola* are associated with washes in lower and mid elevations. For this project, stands in washes were >5 acres in order to map. If smaller, they were mapped with the adjacent best-wash indicator (e.g., *Ericameria paniculata, Chilopsis linearis, Ephedra californica, Psorothamnus spinosus, Prosopis glandulosa,* etc.*)...*
7211 = *Ambrosia salsola - Bebbia juncea* (Cheesebush - Sweetbush scrub) Alliance
Including the 4216 = *Ambrosia salsola* (Cheesebush)

Mapping Unit

Ericameria paniculata ≥2% absolute cover and/or ≥ 25% relative cover. Widespread throughout a broad elevation range in much of the mapping area, in relatively large, recently active washes. Usually in lower energy portions of washes than *Lepidospartum squamatum* and, if mixed with it, then >2 times the cover of it to make this alliance. If a stand is below MMU and adjacent to a *Chilopsis linearis* stand, subsume it into the *Chilopsis* map polygon…

4213 = *Ericameria paniculata* (Blackstem rabbitbrush) Alliance

Prunus fasciculata or *Salazaria mexicana* ≥2% absolute cover and ≥25 percent of total relative cover. *Gutierrezia sarothrae* and *Lycium cooperi* may have higher cover (up to 2x). If *P. fasciculata* co-occurs with other tall shrubs such as *Acacia greggii*, it must have 2x the cover of other species to make the alliance definition. Usually of upper elevations (above 1000m, 3000ft) and usually in mountains in well defined canyons or valley bottoms. Typically of washes and arroyos but may occur on wash terraces or on concave rocky slopes. Cover may be high following resprouting from fire. The following species are common associates: *Ericameria teretifolia, Lycium cooperi, Yucca schidigera, Rhus trilobata,* and *Purshia tridentata.* Occurs adjacent to *Eriogonum fasciculatum* or *Grayia spinosa* stands, and also occurs adjacent to *Artemisia tridentata* stands near base of San Gabriel Mountains...

7212 = *Prunus fasciculata - Salazaria mexicana* (Desert almond - Bladder sage scrub) Alliance

Including the 4214 = *Prunus fasciculata* (Desert almond - Bladder sage) Sub-Alliance

Fallugia paradoxa is the dominant or co-dominant with other shrubs including *Garrya flavescens* and *Prunus fasciculata.* It occurs in rocky washes and arroyos….

7213 = *Fallugia paradoxa* (Apache plume scrub) Alliance (not mapped and not inventoried in the study area)

Rarely strongly dominant, *Brickellia incana* usually occurs with *Ephedra californica* and/or *Ambrosia salsola*. It occurs in sandy washes in the Central Mojave, usually at mid to lower elevations as around Coyote Lake, and south of Barstow. Some large stands are strongly dominated by *B. incana,* as seen in the hills northwest of the Hodge Road exit off of Interstate 15, between Victorville and Barstow...

7211 = *Ambrosia salsola - Bebbia juncea* (Cheesebush - Sweetbush scrub) Alliance

Including the 4215 = *Brickellia incana (*Woolly brickellia) wash scrub Provisional Association

Bebbia juncea is the dominant shrub or co-dominant with *Ambrosia salsola* along rocky washes or on rocky slopes, often occupying sites following disturbance such as fire and clearing. Stands may include *Hyptis emoryi, Parkinsonia florida,* or other taller woody species at sparse cover. Stands are often present further south in the Colorado / Sonoran Desert and southern Mojave Desert…

7211 = *Ambrosia salsola - Bebbia juncea* (Cheesebush - Sweetbush scrub) Alliance

Including the 4218 = *Bebbia juncea* (Sweet-bush scrub) Association

Artemisia tridentata ssp. *parishii* is the dominant shrub. Stands may have *Atriplex canescens, A. polycarpa, A. torreyi, A. confertifolia* or *Ericameria nauseosa,* or and may have emergent *Forestiera or Prosopis* with low cover. Small, usually linear stands associated with low gradient channels and washes around Lancaster-Palmdale. Associated with *Prosopis glandulosa* on Edwards AFB, and with *Forestiera and A. polycarpa* on finer soils west and north of Lancaster, and with *Ericameria nauseosa* in the Owens Valley. This vegetation is often habitat for the rare species, *Calochortus striatus.* Mapped if ≥1 acre in size [Note: see 69 for stands dominated by *Artemisia tridentata* ssp. *tridentata*]…

5311 = *Artemisia tridentata* (Big sagebrush) Alliance

Including the 4217 = *Artemisia tridentata* ssp*. parishii* (Parish's sagebrush) Provisional Association

62'. Wash or wetland margin vegetation of the warmer desert parts of the study area. Shrubby "trees" of mesquite (*Prosopis glandulosa* or *P. pubescens*), desert willow (*Chilopsis linearis*), smoke tree (*Psorothamnus spinosus*), paloverde (*Parkinsonia florida*), ironwood (*Olneya*) or tall wash or wetland shrubs such as *Pluchea sericea* and *Hyptis emoryi* characterize these stands. Usually found in areas that concentrate water such as edges of springs, river terraces, washes, etc. It is important to note that all of these taller desert woody plants are considered "trees" and thus require only a minimum of 2% absolute cover (evenly distributed) to be considered the dominant layer. This is true even if the lower shrub or herb layer is noticeably higher in cover...

4220 = Sonoran-Coloradan semi-desert wash woodland/scrub

65. Stands dominated by generally large woody plants that tend to

be taller or broader than the typical *Larrea tridentata.* These include mesquite (*Prosopis glandulosa* or *P. pubescens*), desert willow (*Chilopsis linearis*), smoke tree (*Psorothamnus spinosus*), paloverde (*Parkinsonia florida*), or ironwood (*Olneya*) (five choices below)...

Prosopis glandulosa and/or *P. pubescens* typically ≥2% absolute cover (rarely 1% in stands with sparse total canopy cover) as the dominant woody plant(s) - not exceeded in cover by any other species of microphyllous tall shrub or tree. In *P. glandulosa* stands, understory shrubs may exceed it in cover, including species such as *Atriplex canescens, A. polycarpa, Larrea tridentata, Pluchea sericea,* and *Suaeda moquinii. P. glandulosa* is usually associated with stabilized dunes or sand sheets adjacent to playas or basins and is mapped even if stands have very low vegetative cover, especially with evidence of recent die-off due to dewatering via ground pumping, etc. Stands along the Mojave River near Daggett-Yermo are almost completely dead, but are mapped if possible. Due to similar ecology and sporadic occurrence as a type, *Prosopis pubescens* is treated in this combined alliance. Furthermore, *P. pubescens* is associated with stands of the usually more abundant *P. glandulosa*. Small stands have been noted for Barstow near the Mojave River, Paradise Springs, and a few other areas. The only large stands seen were along the Colorado River in the Colorado River Indian Reservation…
4222 = *Prosopis glandulosa - Prosopis velutina - Prosopis pubescens* (Mesquite bosque, mesquite thicket) Alliance

Stands characterized (1% or higher cover) by *Chilopsis linearis. Chilopsis* usually has higher cover than any other large shrub/small tree, although stands may contain similar cover of *Acacia greggii* and/or *Prunus fasciculata.* Occurs in washes, intermittent channels, arroyos, or lower canyons that are intermittently flooded. Stands rarely at permanent springs or seeps and not usually associated with *Populus fremontii, Salix* spp., or other true riparian species; adjacent to *Ericameria paniculata, Ephedra californica, Ambrosia salsola,* and *Atriplex polycarpa or A. canescens* stands in washes as far west as Daggett along the Mojave River. Stands tend to occupy sandy or gravelly washes where wash energy is dissipated across a relatively wide flood path. It does not range up into the mountain valleys and narrow arroyos as much as the *Acacia greggii* or *Prunus fasciculata* Alliances, and does not tend to occupy the most active wash centers, as do the *Psorothamnus spinosus, Ericameria paniculata, or Ambrosia salsola* Alliances...
7222 = *Chilopsis linearis - Psorothamnus spinosus*

(Desert willow - Smoke tree woodland) Alliance
Including the 4224 = *Chilopsis linearis* (Desert willow woodland) Association

Psorothamnus spinosus is consistently distributed in low energy washes (normally at >1%, but occasionally lower). No other tall shrub or short tree species with greater cover. *Chilopsis linearis* may occur in some stands at equal cover. *Larrea tridentata* or *Ambrosia salsola* may be similar or higher in cover. Only in eastern part of study area on lower or mid fan wash systems out of Newberry Mountains or Twentynine Palms area. Usually associated with *Ericameria paniculata* or *Ambrosia salsola* washes, occasionally with *Ephedra californica* stands.
7222 = *Chilopsis linearis - Psorothamnus spinosus* (Desert willow - Smoke tree woodland) Alliance
Including the 4225 = *Psorothamnus spinosus* (Smoke tree woodland) Association

Olneya tesota and *Parkinsonia florida* occur together or on their own and have at least 2% combined cover (in both the shrub and tree layers).
Associated species may include *Larrea tridentata* and *Ambrosia salsola*, which may have similar or higher cover to *Olneya tesota* and/or *Parkinsonia florida*. Stands occur east and south of Joshua Tree National Park. They are usually tied to small to large washes and occasionally are spread out over the middle portions of large alluvial fan systems...
4227 = *Parkinsonia florida* – *Olneya tesota* (Blue palo verde-ironwood woodland) Alliance

65'. Stands with the major woody species *Acacia greggii*, *Castela emoryi, Pluchea sericea*, *Tetracoccus hallii,* or *Hyptis emoryi* visually prominent (may be as low as 1% cover), characteristic, and of even distribution. These species are smaller in stature than those in couplet 65. Although the stands may include scattered individuals of those species characteristic of the previous couplet, they are in insufficient cover or dispersion to be diagnostic (four choices below)...

Pluchea sericea is present in the canopy with >2% absolute cover and no other shrub species having equal or greater cover. Occurs around springs, seeps, irrigation ditches, canyon bottoms, stream sides, and seasonally flooded washes. May include *Baccharis salicifolia, Atriplex, Ericameria nauseosa*, and others. Stands occur abundantly adjacent to the Colorado River Valley in alkaline terraces adjacent to *Prosopis glandulosa, Suaeda moquinii*, and occasionally *Phragmites australis*

stands...
4221 = *Pluchea sericea* (Arrow weed thickets) Alliance

Acacia greggii (= *Senegalia greggii*) or *Hyptis emoryi* is characteristic, occasionally with as low as 1% cover. No other tall shrub species has greater cover, except *Prunus fasciculata,* which may have equal or slightly greater cover. Smaller shrubs such as *Larrea tridentata, Ericameria paniculata, Krameria grayii* or *Ambrosia salsola* can have higher cover but no more than three times the cover of *Acacia greggii* or *Hyptis emoryi* (these taller shrubs are 25% relative cover or greater). Occurs in washes and arroyos, as well as upland valleys and on bouldery slopes. Proliferates after disturbance, such as flood and fire. Found in the Ord Mountains and as far west as the north slope of Sidewinder Mountain into our study area and near Twentynine Palms…
4226 = *Acacia greggii – Hyptis emoryi – Justicia californica* (Catclaw acacia thorn – Desert lavender – Chuparosa scrub) Alliance

Including the following: *Hyptis emoryi* is characteristic at ≥2% cover. Other shrub species similar in cover or co-dominant and may include *Acacia greggii, Hymenoclea salsola, Larrea tridentata,* and *Sarcostemma hirtellum.* In rocky washes of upper bajadas and low-elevation canyons, only in the southern and eastern portion of the study area north of Joshua Tree NP…
4228 = *Hyptis emoryi* (Desert lavender scrub) Association

Tetracoccus hallii is characteristic and dominant or co-dominant. Localized in a few areas of the Sonoran and Colorado Desert in alluvial, wash sites with *Acacia greggii, Hymenoclea salsola,* and related wash shrubs…
4211 = *Acacia greggii – Hyptis emoryi – Justicia californica* (Catclaw acacia thorn – Desert lavender – Chuparosa scrub) Alliance, 7223 = *Tetracoccus hallii - Acacia greggii* (Hall's shrubby- spurge - Catclaw acacia patches) Association

Castela emoryi is characteristic and dominant or co-dominant. Localized in a few areas of the southern Mojave, Sonoran, and Colorado Desert in alluvial, wash sites and small playas…
4229 = *Castela emoryi* - (*Ephedra californica*) (Crucifixion thorn – (California joint fir scrub) Association

53'. Stands occur in dry interior portions of the cool temperate zones of

continents where precipitation is low but winters are also relatively cold. In this study, stands occur primarily in the Mojave Desert and adjacent desert mountain borderlands and not in the southerly lower elevation portions of the study area such as the Sonoran or Colorado Deserts. Locally it is difficult to differentiate some alliances in this subclass from those in the warm semi-desert subclass because the Mojave Desert is transitional between cool and warm deserts and has great topographic variety. Therefore it is common to encounter stands of the warm and cool deserts (52 and 52') adjacent or even intermixed. Thus, this seemingly large dichotomy in the key is often locally less significant than it appears. Mid- and upper-elevation vegetation characteristic of the Mojave Desert ecoregion can be placed into cool semi-desert subclass based on overarching ecological conditions. This includes such iconic vegetation as the *Yucca brevifolia* and *Yucca schidigera* alliances.

Stands include long-persisting woody species but also commonly include species that colonize readily and rapidly when certain conditions are met. *Ericameria* is a particularly diagnostic genus (except *E. paniculata*). *Atriplex confertifolia* and *A. canescens* are both placed in the cool desert subclass even though at the subspecific level, the local expression of this vegetation may occur in warmer parts of the desert…

5000 = COOL SEMI-DESERT SCRUB AND GRASS SUBCLASS

66. Stands with the following, generally short-lived and fast-colonizing shrubs being common and diagnostic: *Atriplex canescens, A. confertifolia, Artemisia tridentata* (various subspecies), *Ericameria cooperi, E. nauseosa, Encelia actoni*, *Gutierrezia microcephala, Ambrosia salsola*, and *Sarcobatus vermiculatus...*

67. Stands are dominated or co-dominated by *Atriplex canescens, A*. *confertifolia*, *Sarcobatus vermiculatus, A. polycarpa,* or *Chrysothamnus albidus.* They occur in many settings, including in dry lakebeds, low dunes adjacent to them, and in rocky uplands or sandy washes...

5100 = Cool Semi-Desert Alkali-Saline Flats

Macrogroup MG093 5110 = Shadscale-saltbush cool semi-desert scrub Group

(four choices below)…

Atriplex canescens characterizes stands, typically with the highest shrub cover, though *A. polycarpa* and *Ambrosia salsola* may have similar or slightly higher cover. Stands may have emergent *Yucca brevifolia*. Prefers sandy substrates, usually stabilized dunes or sand ridges, and sandy washes surrounded by *Larrea tridentata – Ambrosia dumosa, Yucca brevifolia* or *Y. schidigera a*lliances. May occur above 1000m (3000ft) elevation in sandy washes in granitic mountains (e.g., Sidewinder Mountains). Var. *linearis* prefers saltier

or more alkaline sand at edges of Coyote Lake, adjacent to *Suaeda moquinii* (downslope) or *Atriplex polycarpa* (upslope). An ecologically similar variety, var. *laciniata*, occurs around the low dunes and playa margin at Palen Lake. This taxon appears to be more salt-tolerant and can occur adjacent to *Allenrolfea occidentalis* on the playa...

5111 = *Atriplex canescens* (Fourwing saltbush scrub) Alliance

Atriplex confertifolia typically has the highest shrub cover, or co-dominates with *A. spinifera* and/or *Artemisia spinescens* on playa edges (as at Edwards Air Force Base). When co-dominant with *Suaeda* on playas, stands key to *Suaeda* Alliance. If *Larrea tridentata* is co-dominant, stands key to *Larrea tridentata* Alliance. When mixed with *Stanleya pinnata, Lepidium fremontii,* and *A. parryi,* stands key to the *A. confertifolia* alliance. When associated with pool and swale topography and *Lasthenia* spp. in Antelope Valley key to *A. confertifolia.* Stands may occur in alkaline valleys or playas and in the upper mid-elevation Mojave Desert on rolling hills and slopes. Stands are common in the northern portion of the mapping area on rhyolite, upland alkaline soils or silty badlands. According to Charlton (in Lichvar et al. 2004), at Edwards Air Force Base, *A. confertifolia* tolerates more saline and finer soils than *A. spinifera* (in areas that have high salt and clay concentrations from hydrological activity at lower elevations)....

5112 = *Atriplex confertifolia* (Shadscale scrub) Alliance

Sarcobatus vermiculatus ≥2%. *Sarcobatus* is the relative dominant and may have S*uaeda moquinii* and *Atriplex confertifolia* or *A. canescens* associated in lesser cover. Stands occur extensively across the Owens Valley in alkali dunes and flats. Also known in study area from small (<1ha) stands in the alkali dunes and flats above the southeast shore of Rodgers Lake, the southwest shore of Rosamond Lake and the southeast margin of Buckhorn Lake. *Sarcobatus* seems to prefer sandy and salty soil just above the more abrupt transition to more alkaline/saline and fine textured lake bed. Locally, stands occur adjacent to *Suaeda* or *A. confertifolia* alliance stands. In one case, the edge of the stand was marked by a sandy ridge covered by an *A. canescens* – *Yucca brevifolia* stand. Note: formally this alliance is part of the **5500 = Cool Semi-Desert Alkali-Saline Wetlands MG082,** nested within the **5510 = Great Basin cool semi-desert alkali basin Group**. However, ecologically it is associated with *Atriplex confertifolia* and *A. canescens* in the stands known from this study area...

5511 = *Sarcobatus vermiculatus* (Greasewood scrub) Alliance

Including *Chrysothamnus albidus* (*=Ericameria albida*) dominant in the shrub layer, typically along alkali terraces or

marshes or alkaline seeps, such as in Fish Slough and Saline Valley, typically associated within the same vicinity as *Sarcobatus*…

***Chrysothamnus albidus* (White-flower Rabbitbrush scrub) Association**

(not mapped and not inventoried in study area)

Atriplex polycarpa typically has the highest shrub cover, usually with ≥2% cover. May occur on playa edges, in washes though alkaline areas, or occasionally uplands with alkaline substrate. Stands can occur on broad flats, in washes, or on steep volcanic ravines and slopes. In this alliance, *Atriplex polycarpa* is dominant in the shrub canopy if these shrubs are present: *Ambrosia dumosa*, *A. salsola*, *Atriplex canescens*, *Cleome isomeris, Isocoma acradenia*, and *Larrea tridentata*. If *Larrea tridentata* is co-dominant, key to the *Larrea tridentata* Alliance. Rarely, *A. dumosa* is co-dominant with *Atriplex* polycarpa and is a part of this alliance. Emergent *Prosopis glandulosa* trees may be present at low cover. If *A. spinifera* or *Suaeda moquinii* is co-dominant in a stand*,* key those respective alliances…

4113 = *Atriplex polycarpa* (Allscale scrub) Alliance

67’. Stands characterized by *Artemisia tridentata, A. arbuscula, Encelia actoni, E. virginensis, Ericameria nauseosa, E. cooperi or Gutierrezia,* with *Atriplex canescens,*
A. confertifolia or *Sarcobatus* being absent or insignificant. Stands may have received recent disturbance from fluvial action, fire, or clearing and are usually in rocky uplands, cobbly washes, or stands are in other upland mid to higher elevation areas that are not alkaline, playa-like, or particularly sandy...

68. The dominant taxa are relatively small, short-lived plants that colonize uplands following natural or unnatural disturbance such as clearing or fire. Stands are characterized by species such as *Encelia actoni, E. virginensis, Ericameria nauseosa, E. cooperi, Gutierrezia, or Psorothamnus spp.* Other co- dominant plants that may occur in such settings include *Ambrosia salsola, Eriogonum fasciculatum,* especially ssp. *polifolium, Ephedra nevadensis, Thamnosma montana*, and *Tetradymia* sp.…

5200 = Cool Semi-desert wash and disturbance scrub Macrogroup MG095 5210 = Intermontane seral shrubland Group (six choices below)...

Encelia virginensis, *E. actoni,* and/or *Viguiera reticulata* ≥2% cover. No other shrub species with greater or equal cover. Typically of washes or other disturbed areas (such as recently burned mid elevation desert slopes) throughout the Mojave

Desert. In the West Mojave borders of the Transverse and Tehachapi ranges, stands often occur on steep south-facing slopes associated adjacent to *Hesperoyucca whipplei* or *Eriogonum fasciculatum*.
The biggest stands are upland, steep, south- or southeast-facing slopes near Valyermo or Gramercy Avenue off of Hwy 138 south of Phelan. Small stands occur in washes and on recently burned slopes in the Stoddard Wells and Whitehorse Mountain area and as far east as Ord Mountain. Stands may also have relatively high cover of *Achnatherum speciosum* and *Salazaria mexicana*. (Note: *Encelia actoni* was previously considered a subspecies of *Encelia virginensis.* The two share very similar ecological traits. *E. actoni* is the taxon most common in the study area)…
5211 = *Encelia (actoni, virginensis*) - *Viguiera reticulata* (Acton's and Virgin River brittlebush - Net-veined goldeneye scrub) Alliance

Ericameria nauseosa typically has ≥2% absolute and ≥30% relative cover. If
E. nauseosa is co-dominant with *Eriogonum fasciculatum,* key to the *E. fasciculatum - Viguiera parishii* Alliance. Found in mid and upper elevations, usually in areas with fire, flood or agricultural or grazing history. Most mappable stands are in the Antelope Valley to Hesperia and are particularly abundant on the margins of the Liebre, Tehachapi, and Sierra Nevada mountains and also off alkali soils in the Antelope Valley. Other mappable stands in the Owens Valley often have *Atriplex torreyi* (which is often sub- dominant). Several subspecies of *E. nauseosa* are included. However, if *Distichlis spicata, Sporobolus airoides* and/or *Leymus cinereus* alone or together with other herbs are ≥3x the absolute cover of *E. nauseosa* and other shrubs, then key to their respective herbaceous alliance …
5212 = *Ericameria nauseosa* (Rubber rabbitbrush scrub) Alliance

Including *Ericameria nauseosa* co-dominant with *Atriplex torreyi (=Atriplex lentiformis* var. *torreyi*)…
5217 = *Ericameria nauseosa – Atriplex lentiformis* (Rubber rabbitbrush – Quailbush scrub) Mapping Unit

Gutierrezia microcephala or *G. sarothrae* are locally dominant on loose substrates such as gravelly washes, and on steep rocky slopes with unstable substrate. Cover of *Gutierrezia microcephala* or *G. sarothrae* is higher than any other shrub. Other shrubs may include *Grayia spinosa, Salvia mohavense, Ericameria teretifolia,* or *E. cooperi.* Most stands in our area are composed of *G. microcephala,* not *G. sarothrae*...

5214 = *Gutierrezia sarothrae – Gutierrezia microcephala* (Snake weed scrub) Provisional Alliance

Ericameria cooperi is strongly dominant across the stand. Stands show evidence of recent disturbance (typically fire) and are usually adjacent to stands with larger and longer-lived shrubs that are more easily keyed to *Grayia spinosa, Ericameria teretifolia, Coleogyne ramosissima,* or *Larrea tridentata – Ambrosia dumosa*. In this type, *E. cooperi* has a significant presence (generally >60% relative cover) in a stand is unusual; most stands with co-dominant *E. cooperi* can be better placed in the *Ambrosia dumosa*, *Ephedra nevadensis - Lycium andersonii - Grayia spinosa*, or *Ambrosia salsola* alliances. Stands co-dominated by *E. nauseosa* or *E. teretifolia* usually key to those alliances, respectively. The species occurs commonly in the Mojave in all sub-regions. It is spring-flowering and shorter-lived species that is more of a disturbance responder than *Ericameria teretifolia… Ericameria cooperi* is co-dominant with *Acamptopappus sphaerocephalus, Pleuraphis rigida,* and other shorter-lived shrubs…
5215 = *Ericameria cooperi* (Cooper's goldenbush) Provisional Association in the *Ephedra nevadensis - Lycium andersonii - Grayia spinosa* (Nevada joint fir – Anderson's boxthorn - Spiny hop sage scrub) Alliance

Ericameria cooperi is evenly distributed and dominant to co-dominant with other shrubs including *Atriplex* spp., *Ephedra nevadensis, Grayia spinosa*, *Lycium andersonii* in rocky often volcanic hills and slopes…
5419 = *Ephedra nevadensis - Lycium andersonii - Grayia spinosa* (Nevada joint fir – Anderson's boxthorn - Spiny hop sage scrub) Alliance

Including the *Ephedra nevadensis - Ericameria cooperi* (Nevada joint fir - Cooper's goldenbush) Association

Psorothamnus arborescens, P. fremontii, P. polydenius, P. schottii, or *Sarcobatus baileyi* is dominant or co-dominant in the shrub canopy. Stands are often on volcanic alluvium or lava flows and may be an artifact of disturbance (e.g., grazing, flooding, fire), or they occur in low-energy sandy washes or along sand dunes (with disturbance from its shifting substrate)… **4219 = *Psorothamnus fremontii - Psorothamnus polydenius* (Fremont's and Nevada smokebush scrub) Alliance**

Including the 4231 = Psorothamnus schottii (Schott's indigo bush) Association

68’. *Artemisia tridentata, A. nova,* or *A. nova* is dominant or co-dominant in the shrub canopy…

69. A subspecies of *Artemisia tridentata* is dominant or co-dominant in the shrub canopy. *A. tridentata* (*sensulato*) ≥2% absolute cover in the shrub canopy. Classification of vegetation using *Artemisia tridentata* has proceeded using different subspecies to indicate alliances due to the ecological stereotypy of many of the races. However, identifying subspecies is difficult because genotypic and phenotypic variation is common. Two different ecologically distinct races are segregated in the classification within the study area:
5300 = Western North America Tall Sage Shrubland and Steppe Macrogroup MG096
5310 = Inter-Mountain West mesic tall sagebrush shrubland and steppe Group…

70. *Artemisia tridentata* ssp. *tridentata* or *A. tridentata* spp. *parishii* is dominant or co-dominant. No other single shrub species has greater cover except *Ericameria nauseosa, Eriogonum fasciculatum*, or *Eriodictyon trichocalyx.* These stands occur in coarse alluvium (granitic sands and gravels) of valleys on the north side of the San Gabriel and Sierra Pelona ranges. Stands also occur in the Owens Valley, which may include ssp. *tridentata* and/or ssp*. parishii.* Stands with co-dominance of *Prunus fasciculata* key to *Prunus.* Stands with >2% cover of *Juniperus californica* or *Yucca brevifolia* (regardless of height) key to *Juniperus* or *Yucca*, respectively...
5311 = *Artemisia tridentata* (Big sagebrush) Alliance

Including the following: *Artemisia tridentata* ssp*. parishii* is dominant or co-dominant. No other single shrub species with greater cover, except *Ericameria nauseosa, Eriodictyon trichocalyx, Atriplex polycarpa, A. canescens, A. confertifolia*, or *A. spinifera*. Those species may be no more than 60% relative cover as long as *Artemisia tridentata* ssp. *parishii* has at least 30% relative cover and is evenly distributed. *A. tridentata* ssp. *parishii* occurs on finer textured soils, more immediately adjacent to swales or intermittent channels than typical stands of *A. t.* ssp. *tridentata*. *A. t.* ssp. *parishii* is largely restricted to silty alluvial sediments of the west Mojave and adjacent Transverse Ranges and appears relatively tolerant of alkalinity, and it also occurs in the Owens Valley. Stands occur adjacent to stands of *Atriplex spinifera, A. polycarpa, A. torreyi,* and

A. confertifolia, Prosopis, Larrea tridentata – Ambrosia dumosa and other core Mojave Desert Alliances. They may also occur immediately adjacent to wetlands (*Juncus arcticus, Distichlis spicata*) and riparian (*Populus fremontii, Forestiera pubescens*) stands. [Note: this can also be keyed in desert xero-riparian group of this key (at couplet 64')]...

4217 = *Artemisia tridentata* ssp*. parishii* (Parish's sagebrush) Association of the *Artemisia tridentata* (Big sagebrush) Alliance

70'. *Artemisia tridentata* spp. *vaseyana* is dominant or codominant with *Ephedra viridis.* Stands typically occur in upper elevation slopes, including along granitic, quartzite, gneiss and other crystalline parent materials of the Inyo, Panamint, and other high mountain ranges of the northern Mojave Desert …
5312 = *Artemisia tridentata* ssp. *vaseyana* (Mountain big sagebrush) Alliance

69'. *Artemisia arbuscula* ssp*. arbuscula* or *A. nova* is dominant or co- dominant in the shrub canopy…
5600 = Western North America Dwarf Sage Shrubland and Steppe Macrogroup MG097.
5610 = Intermountain Low Sage Shrubland and Steppe Group

71. *Artemisia arbuscula* ssp. *arbuscula* is dominant or co-dominant with shrubs such as *Chrysothamnus viscidiflorus, Ephedra viridis, Gutierrezia sarothrae, Purshia tridentata.* Found at higher elevation, upper slopes often on calcareous substrates in the highest portions of the Inyo, Panamint, and other tall ranges of the northern Mojave Desert…
5611 = *Artemisia arbuscula* ssp. *arbuscula* (Little sagebrush scrub) Alliance

71'. Found at higher elevation, rocky slopes and ridges of basalt or limestone with shallow and poorly drained soils in the highest portions of the Funeral, Inyo, Panamint, and other tall ranges of the northern Mojave Desert…
5612 = *Artemisia nova* (Black sagebrush scrub) Alliance

66'. Vegetation is usually characterized by scrubs of the cooler (higher elevation) desert. Most diagnostic species are long-lived. Some resprout following fire, but some are extremely sensitive to fire (especially *Coleogyne*). Although widespread in the higher elevations of the Mojave Desert, in many areas of the western and central Mojave and Sonoran desert, fires and clearing have resulted in a complex of transitional types

that intergrade between seral scrub alliance stands and more stable persistent stands. *Larrea tridentata, Encelia farinosa,* and for the most part *Ambrosia dumosa* are not present as major alliance indicators. Indicator species include: *Coleogyne ramosissima, Ericameria teretifolia, Grayia spinosa, Krascheninnikovia lanata, Ephedra nevadensis, E. viridis, Eriogonum fasciculatum, Lycium andersonii, L. cooperi, Purshia tridentata, Salazaria mexicana, Yucca brevifolia* and *Yucca schidigera…*

5400 = Inter-Mountain Dry Shrubland and Grassland Macrogroup MG098

72. Stands with the following species as diagnostics: *Grayia spinosa, Krascheninnikovia lanata, Ephedra nevadensis, E. viridis, Eriogonum fasciculatum, Lycium andersonii, L. cooperi,* and *Salazaria mexicana.* These vegetation types merge with the upper edge of the *Larrea tridentata – Ambrosia dumosa* belt and are usually seen on north-facing slopes at lower elevations, but also occupy basins and slopes at all elevations above 1050m (3500ft). While they may occur on slopes, they are also found on medium textured soils of basin margins and lower fans, especially in cool air drainages. This group includes many similar vegetation types with subtle distinction between them based on soil texture, chemistry and disturbance regime. Most types recover rapidly following fire compared to the Mojave and Great Basin Upper Bajada and Toeslope Group. [Note: *Eriogonum fasciculatum* (esp. *E.* ssp. *polifolium*) is a common associate in this group, especially on rocky uplands. If *Eriogonum fasciculatum* is a dominant with any of the following alliance-level indicators present, key to *Eriogonum fasciculatum* (desert version), if lower in cover than any other shrub, key to another appropriate alliance based on rules in categories in the following alliances]...

5410 = Intermontane deep or well-drained soil scrub Group

73. *Krascheninnikovia lanata* is dominant to co-dominant in mid- to upper- elevation flats and small basins dominated strongly by the low shrub without any other species in higher cover. Stands occur in small basins with silty, but not strongly alkaline soil, southeast of California City, where *Atriplex spinifera* is not dominant. These stands give way to *Grayia*, then *Ambrosia dumosa*, and then *Larrea tridentata – Ambrosia dumosa* in sequence as one moves up-slope. The largest stands occur in Superior Valley, in matrices adjacent to *Atriplex spinifera* on calcium rich soils (with a whitish caliche layer at surface), or *Atriplex confertifolia* on saltier basin soils, or *Ambrosia dumosa* on slightly higher slopes with better drained soils. *Krascheninnikovia lanata* also occurs on altered calcareous soils adjacent to volcanics on northwest slopes and eastern slopes of the El Paso Mountains - specifically on shallow caliche and high pH rocks (e.g., rhyolite, dolomite) where stands tend to co-dominate with *Grayia* and *Tetradymia axillaris.* Stands have been assumed rare throughout the California deserts, but

some extensive stands have been mapped in this study. These include the largest ones now known from California...
5412 = *Krascheninnikovia lanata* (Winterfat scrubland) Alliance

73'. Stands are dominated by *Ephedra nevadensis, Ephedra viridis, Lycium andersonii, Lyciium cooperi,* and/or *Grayia spinosa…*

74. *Ephedra viridis* ≥2% cover (rarely 1% in stands with sparse total canopy cover) and dominant or co-dominant with other shrubs. In our area, *Ephedra viridis* is dominant or co-dominant with *Ericameria teretifolia, Grayia spinosa*, *Salazaria mexicana, Krascheninnikovia lanata, Ericameria cuneata*, or *Eriogonum fasciculatum*. Found on steep, boulder-covered slopes of mid-elevation to higher mountains in the study area, from the Scodie Mountains west of the California Aqueduct, to the highest points of the Ord Mountains (>1800m, 5900ft). Associated with steep talus or rock outcrops except at the highest elevations, when it can occur on more moderate slopes. Tends to mix with *Grayia spinosa*, *Salazaria mexicana* or with *Ericameria teretifolia* in slightly lower and warmer, rocky settings. Also may mix with *Brickellia desertorum* on slopes of the Sidewinder or Granite mountains (near Apple Valley)…
5417 = *Ephedra viridis* (Mormon tea scrub) Alliance

74'. Stands not characterized by *Ephedra* viridis (though it may be present in lesser numbers than other shrub species)…

75. *Lycium cooperi* is dominant and evenly distributed across the stand or it is co-dominant with *Ambrosia salsola*. If *Grayia spinosa, Krascheninnikovia lanata* or shrubby *Atriplex* species are co-dominant, stands key to those alliances, respectively. Occasional stands exist at the margins of alkaline or saline basins, or on terraces above washes where soils are moderately fine-textured. *Lycium cooperi* increases following fires relative to more weakly sprouting or non-sprouting species such as *Larrea tridentata, Ambrosia dumosa,* and *Atriplex* spp. When co- dominant with *Salazaria, Atriplex canescens*, or *Prunus fasciculata*, as in washes and arroyos, key to those alliances…

5418 = *Lycium cooperi* (Cooper's boxthorn scrub) Provisional Association in the 5419 *Ephedra nevadensis - Lycium andersonii - Grayia spinosa* (Nevada joint fir - Anderson's boxthorn - Spiny hop sage scrub) Alliance

75' Shrubs other than *Lycium cooperi* dominant…

76. *Ephedra nevadensis, Lycium andersonii* and/or *Grayia spinosa*

>2% cover. No other species with greater cover with the exceptions of *Acamptopappus sphaerocephalus* or *Chrysothamnus viscidiflorus*. **5419 = *Ephedra nevadensis - Lycium andersonii - Grayia spinosa* (Nevada jointfir - Anderson's boxthorn - Spiny hop sage scrub) Alliance** (with the following three sub-alliances below)…

a. *Ephedra nevadensis* dominant or co-dominant. Stands in this study occur in two basic situations: (1) cooler mid- or upper rocky slopes of mountains where *Salazaria, Lycium andersonii, Encelia actoni* and *Ericameria cooperi* are co-dominant, often replacing *Grayia spinosa* or *Coleogyne ramosissima* following repeated fire; or (2) broad terraces adjacent to large washes (e.g., Little Rock Wash, Rock Creek Wash) between Pearblossom and Palmdale, often co- dominant with *Encelia actoni* and containing emergent *Yucca brevifolia.* These expressions are may be adjacent *to Larrea tridentata-Ambrosia dumosa* stands (upper elevation associations of *Larrea tridentata-Ambrosia dumosa* often contain *E. nevadensis*) or adjacent to stands co-dominated by *Eriogonum fasciculatum*. Fire stimulates resprouting in *E. nevadensis,* as does occasional fluvial disturbance. *Ephedra nevadensis* stands are difficult to predict because of their dependence upon fire or fluvial disturbance. Rocky substrates, either cobble-alluvium or shallow broken colluvium on slopes are usually important. Stands are not found on extensive sandy or fine-textured soils.

Stands often mix with other mid-elevation scrub species such as *Grayia*, *Salazaria mexicana, Tetradymia* spp., *Ericameria cooperi, Eriogonum fasciculatum,* or (near Twentynine Palms), *Viguiera parishii* and *Simmondsia chinensis. Achnatherum speciosum* is common in many stands. *Coleogyne ramosissima* and *Ephedra nevadensis* often occur in similar situations and exposures, but *Coleogyne* is killed outright by fire, while *E. nevadensis* is stimulated by it. Thus, *E. nevadensis* may in some cases be a type conversion from *Coleogyne* in many burned areas of the desert mountains. If *Eriogonum fasciculatum* is co-dominant with *E. nevadensis,* the stand would key to *Eriogonum fasciculatum* (desert version)...

5413 = *Ephedra nevadensis* (Nevada joint fir) Sub-Alliance

b. *Lycium andersonii* is strongly dominant without high cover of other alliance indicators such as *Salazaria, Grayia, Ephedra nevadensis,* or *Eriogonum fasciculatum.* Rarely mappable and poorly defined, although a common widespread shrub of many mid- and upper- elevation scrubs of the Mojave and southern Great Basin. Stands are rare in our study area and usually small in extent. Small stands have been noted in several situations from low granitic rock outcrops, cooler or steep rocky volcanic slopes and talus, to rocky uplands above *Grayia* stands in cold air drainages and basins. This type is closely ecologically related to several other alliances, *(Larrea tridentata – Ambrosia dumosa, Yucca schidigera).* This type is not described in Thomas et al. (2004), but is discussed in Barbour et al. (2007). Beatley (1976) discusses its relationship to *Atriplex confertifolia* and *Grayia spinosa* in the Nevada test site...

5414 = *Lycium andersonii* (Anderson's boxthorn scrub) Sub-Alliance

c. *Grayia spinosa* usually ≥2% absolute cover (rarely <2% in stands with a very sparse total shrub cover), evenly distributed. Co- dominance is the rule with *G. spinosa* stands; they rarely are strongly monospecifically dominant. Thus, careful assessment of shrub dispersion is important for proper identification. In many cases stands have been affected by fire, clearing, grazing, or other disturbances and seral shrubs or increasers like *Tetradymia stenolepis*, *Ericameria cooperi, Ephedra nevadensis, Lycium cooperi, Lepidium fremontii, Senna armata*, or *Lycium andersonii* can have similar cover. *Grayia spinosa* stands occupy the transition between warm desert and cool desert vegetation in much of the study area. *G. spinosa* does re-sprout after fire, and along with *Salazaria, Encelia actoni,* and *Lycium andersonii,* may replace *Coleogyne ramosissima* stands as a result. There are many post-fire seral stands with strong mixtures of multiple species, but if *G. spinosa* is evenly distributed in such stands they key to *G. spinosa.* If *Ephedra viridis* is present at ≥2% cover and evenly distributed, please see *E. viridis* alliance.

At lower elevations, *Grayia* stands usually occur on

north-facing slopes in regions dominated by *Larrea tridentata – Ambrosia dumosa*, in lower basins and cold-air drainages on relatively well- drained medium-textured soils. Larger stands occur on moderate to gentle mid- and upper-slopes above approximately 1000m (3000ft) or on basin margins in a "bathtub ring" above *Atriplex polycarpa* or *A. spinifera* stands. At similar elevation to *Coleogyne ramosissima*, *Grayia* stands are on relatively less rocky and less exposed sites (mid-slope, not convex upper-slope) and often have evidence or more recent fire. Stands transition to *Ambrosia dumosa* adjacent to *Larrea tridentata – Ambrosia dumosa* on lower slopes, and to *Ericameria teretifolia* or *Ephedra nevadensis* on convex rocky slopes, or *Salazaria mexicana* on concave (often burned) rocky slopes, or *Ephedra viridis* on higher elevation rocky crags or slopes. Abrupt shifts in soil texture in flats and basins give way to *Atriplex spinifera* or *A. polycarpa* on fine textured soils, or to *Krascheninnikovia lanata* on calcareous soils, or to *Ambrosia dumosa* or *Larrea tridentata – Ambrosia dumosa* on well-drained slopes above cold air pockets... **5411 = *Grayia spinosa* (Spiny hop sage scrub) Sub-Alliance**

76'. Stands with *Ericameria teretifolia, Eriogonum fasciculatum,* or *Salazaria mexicana*. Often in recently disturbed sites, or rocky upper bajadas with sheet flow, or colluvial settings. (Three choices below)…

Ericameria teretifolia ≥2% absolute cover (rarely <2% cover in stands with a very sparse shrub layer). *Ericameria teretifolia* typically has the highest cover, but may share dominance with *Eriogonum fasciculatum, Gutierrezia sarothrae*, or *Opuntia chlorotica*. Found in disturbed uplands in the mid-elevation Mojave or Sonoran Desert, but also occurs in longer-persistent stands on shallow granitic pediments and rock outcrops. *Ericameria teretifolia* is the dominant or co-dominant shrub and may occupy shallow rocky post- fire stands associated with *Juniperus californica* or other upland alliances. In our area it is usually found in low cover shrublands, on granitic or other rocky uplands on south- or north-facing steep, bouldery slopes, and is more warm-tolerant than *Ephedra viridis* and thus usually at lower elevations. When co-dominant with *Grayia, Ephedra viridis, Coleogyne,* or *Salazaria*, key to those alliances… **5416 = *Ericameria teretifolia* (Needleleaf**

rabbitbrush scrub) Alliance
Eriogonum fasciculatum ≥2% absolute cover (rarely <2% cover in stands with a very sparse shrub layer) or >50% relative cover in the shrub canopy; other shrubs if present usually less than half its cover, and *Ephedra nevadensis*, *Ericameria nauseosa,* or *Ambrosia salsola* can be broadly co-dominant with *Eriogonum fasciculatum*. Mixed stands with *Ericameria cooperi* or *Grayia spinosa* and other mid- elevation shrubs only require *Eriogonum fasciculatum* to have higher cover and be more evenly distributed than any of the other shrubs. Most pure stands occur along the east face of the Tehachapi and Scodie Mountains. These stands and others in the Cajon Pass area that are surrounded by chaparral tend to have substantially higher shrub cover and usually do not co-dominate with many species, instead they are often single dominant stands. In the desert hills and mountains >1000m (3000ft) elevation, *Eriogonum fasciculatum* co-occurs with many other semi-desert shrubs; if *Encelia actoni, Ephedra nevadensis, Ericameria teretifolia, Purshia tridentata* or *Ericameria linearifolia* are equal or higher cover, then go with those alliances....
2221 = *Eriogonum fasciculatum - Viguiera parishii* (California buckwheat - Parish's goldeneye scrub) Alliance

Salazaria mexicana ≥2% cover. Other shrubs, if present, are in lower cover, with the exceptions of *Ambrosia salsola, Eriogonum fasciculatum, Hyptis emoryi, Senna armata or Salvia dorrii,* which may have higher or similar cover. *Salazaria* stands mostly occur in sandy or gravelly washes where fire has been minimal, but may occur on burns or in other disturbed uplands throughout steep and rocky uplands. Substrate for all expressions of this alliance is frequently granitic or crystalline metamorphic (gneiss, schist, phyllite). In washes, *S. mexicana* often commonly occurs with *Ambrosia salsola, Bebbia juncea, Eriogonum fasciculatum* or *Senna armata.* On rocky slopes, it tends to occupy bases of larger outcrops or narrow concave defiles, or ravines where water is channeled during run-off. Depending upon the site topography, many upland *Salazaria* polygons may actually contain a fine-scale matrix of several vegetation alliances including *Encelia actoni, Ephedra nevadensis, Eriogonum fasciculatum, Ambrosia salsola* or *Ericameria teretifolia.* In such instances, the overall expression of burned rocky uplands with a number of concavities or

concentrations of vegetation at the base of rock outcrops tends to emphasize the balance of overall cover toward *Salazaria*, even though other small stands may be present…

7212 = *Prunus fasciculata - Salazaria mexicana* (Desert almond - Bladder sage scrub) Alliance

Including the 5415 = *Salazaria mexicana* (Bladder sage scrub) Association

72'. Stands with other shrub or herbaceous species as diagnostics...

77. Shrubs form the dominant layer (at least 2% and evenly distributed). If present, *Grayia spinosa, Krascheninnikovia lanata, Ephedra nevadensis, E. viridis, Eriogonum fasciculatum, Lycium andersonii, L. cooperi, Salazaria mexicana* are usually less conspicuous or subordinate to species in the genera *Coleogyne, Purshia, Menodora, Cercocarpus,* or *Yucca*...

5420 = Mojave and Great Basin upper bajada and toeslope Group

78. *Coleogyne ramosissima* is the dominant or co-dominant shrub, typically with no species of *Yucca, Juniperus,* or taller shrub greater than 33% of the total relative cover of *Coleogyne*, though other smaller shrubs such as *Ephedra nevadensis* and *Eriogonum fasciculatum* may have similar cover. If *Yucca schidigera* is present, it only needs to be >1% absolute cover and evenly distributed to shift into a *Yucca schidigera* alliance. If *Coleogyne* is >3 x *Yucca schidigera,* then it is a *Coleogyne* stand. *Coleogyne* typically dominates stands, but may be exceeded in cover by a species of disturbance (*Ambrosia salsola, Salazaria mexicana, Ericameria* spp. or *Eriogonum fasciculatum*). A widespread type on shallow rocky soils on upper bajadas, pediments and hill slopes; generally upslope from *Larrea tridentata – Ambrosia dumosa,* on shallower soils of old alluvium or shallow rocky pediments. Does not prefer steep colluvial deposits with larger rocks and boulders. It is extremely susceptible to even low-intensity fire and many thousands of acres of *Coleogyne ramosissima* are now converted to *Grayia, Salazaria, Ericameria,* and *Ambrosia* types throughout the mapping area. The Stoddard Wells, Fairview Valley, and Ord Mountain areas are particularly devastated by fires...

5421 = *Coleogyne ramosissima* (Black brush scrub) Alliance

78'. *Coleogyne* is not important. Instead, *Yucca, Purshia, Cercocarpus* or
Menodora is conspicuous and/or dominant…

79. A *Yucca* species is conspicuous and evenly distributed

(two choices below)...

Yucca brevifolia present and evenly distributed throughout the stand, though usually only between 1 and 5% cover (cover may be as high as 10% in clonal stands in the western part of the mapping area).
Stands often have substantially higher cover of shorter shrubs or perennial grasses beneath the well-spaced emergent trees. *Yucca brevifolia* must be evenly distributed, not scattered and clumped, and must be 1% or greater absolute cover to map at the alliance level. It is usually difficult to discern juvenile *Yucca brevifolia* <3m tall, so these are not always accounted for in mapping. If *Juniperus californica* is present, *Yucca brevifolia* must be >2 x the cover of *Juniperus. Pinus monophylla* must be lower than 1% absolute cover and not evenly distributed. If sclerophyll shrubs such as *Fremontodendron* or *Quercus john-tuckeri* are present, these are less than 10% absolute cover...
5423 = *Yucca brevifolia* (Joshua tree woodland) Alliance

Yucca schidigera is conspicuous, evenly distributed and generally
≥2% absolute cover; however, since sub-meter imagery has been used and signatures are generally recognizable at low covers, *Y. schidigera* has been pulled out as low as closer to 1% absolute cover as long as it is evenly distributed. At lower elevations, stands may have *Larrea tridentata, Ambrosia dumosa*, and other shrubs at equal or even higher cover. *Yucca brevifolia* is often scattered in the tree layer (<1%). At upper elevations, *Juniperus californica* may be present (<2% cover). If *Juniperus* is ≥2x the cover of *Yucca schidigera*, then key to the *Juniperus californica* Woodland Alliance. If *Coleogyne ramosissima* is conspicuous, *Yucca schidigera* must have ≥2% cover. Found on pediments and hillslopes near the upper- elevation range of the alliance, and common on bajadas and moderate to gentle hillslopes at mid-elevations. Occurs predominantly in the southeast portion of the study area, including the Ord Mountains, Stoddard Wells, and Fairview Valley...
5424 = *Yucca schidigera* (Mojave yucca scrub) Alliance

79'. *Yucca* is not important and not evenly distributed. Instead, either *Cercocarpus, Purshia, or Menodora* are conspicuous, dominant, or co- dominant (four choices below)...

Purshia tridentata or *P. glandulosa* has ≥2% absolute cover and often has higher relative cover than any other single shrub (but see exceptions below), though it may be dominant or co-dominant with shrubs such as *Artemisia tridentata*. Stands are well-represented in the Jawbone area and west of Owens Valley in the eastern Sierra Nevada where *P. tridentata* or *P. glandulosa* are dominant or co- dominant with *Artemisia tridentata*. Stands are locally represented adjacent to the San Bernardino, San Gabriel and southern Sierra Nevada Mountains. Confusion between this alliance and *Eriogonum fasciculatum*, *Encelia actoni,* and *Ericameria linearifolia* alliance stands occurs on the north slopes of the San Bernardino Mountains south of Lucerne Valley. These stands are often the result of burned *Juniperus californica*, *Pinus monophylla,* or other long-lived woody plants that have resprouting *Purshia*. Exceptions include steep rocky slopes near Cushionberry Grade and steep incised faces of old alluvial surfaces at the base of the San Gabriel Mountains near Valyermo, where stands are co-dominant with *Eriogonum fasciculatum, Encelia actoni, Ephedra nevadensis,* and *Hesperoyucca whipplei*. Rarely, *Prunus andersonii* is higher in cover than *Purshia tridentata* (in post-burn sites) and still placed in this alliance...

5422 = *Purshia tridentata - Artemisia tridentata* (Bitter brush – Big sagebrush scrub) Alliance

Purshia stansburiana is dominant in the shrub layer, typically on limestone outcrops at mid-elevations in the Central Mojave Desert

….

5442 = *Purshia stansburiana* (Stansbury cliff rose scrub) Alliance

Menodora spinescens with ≥2% cover and no other single species with greater cover, although many other species may be present. Represented by a few localized stands in well-defined, shallow rocky soils, characteristically just above *Larrea tridentata – Ambrosia dumosa*. Locally restricted to pale limestone (or possibly dolomite) outcrops associated with pediments north of Ord Mountain...

5425 = *Menodora spinescens* (Greenfire scrub) Alliance

Cercocarpus ledifolius is dominant as a tall shrub or small tree, which must be at least 2% cover and evenly

distributed. No other large shrub or small tree has similar or greater cover. Stands occur in dry, rocky, and usually very well-drained exposures in the highest portions of the Inyo, Panamint, and other tall ranges of the northern Mojave Desert - but currently only known to occur adjacent to *Coleogyne* on limestone, on the north slope of the San Bernardino Mountains in the study area. These low elevation stands (1400m, 4600ft) may very well be the only stands in the study area...
5441 = *Cercocarpus ledifolius* (Curl leaf mountain mahogany scrub) Alliance (formally within the 5440 = Intermountain shallow/calcareous soil scrub Group)

Cercocarpus intricatus or *Philadelphus microphyllus* is dominant or co-dominant in the shrub layer. Represented by a few localized stands in well-defined, shallow rocky calcareous sites in desert mountains and the eastern Sierra Nevada.
5443 = *Cercocarpus intricatus* (Small leaf mountain mahogany scrub) Alliance (not mapped and not inventoried in study area)

77'. Shrubs are not evenly distributed and perennial grasses and forbs (including *Achnatherum spp., Pleuraphis jamesii, Hesperostipa comata, Sphaeralcea ambigua, Sporobolus cryptandrus,* etc) comprise the dominant layer…
5430 = Southern Great Basin semi-desert grassland Group

Achnatherum speciosum is dominant, with no shrubs comprising more than 10% relative cover and none evenly distributed across the stand. Stands are the result of fire eliminating desert shrub cover from stands that were formerly *Coleogyne ramosissima*, *Larrea tridentata – Ambrosia dumosa*, *Atriplex canescens*, etc. The largest stands noted occur in the western Antelope Valley and Superior Valley. Persistence is unknown, but stands probably develop shrub dominance in <50 years, without fire or other disturbance...
5431 = *Achnatherum speciosum* (Desert needlegrass grassland) Alliance

Pleuraphis jamesii, Bouteloua eriopoda, and/or *Scleropogon brevifolius* comprises >2% cover with no other perennial grasses or shrub species present in greater cover, though these grasses can be co-dominant together. Stands are restricted to below minimum map unit size, except perhaps on parts of the upper slopes of Ord Mountain, Stoddard Mountain, Sidewinder

Mountain and other peaks ≥1500m (4500ft), in the central or northern portions of our study area that receive some reliable summer precipitation.
They occur on rocky, gentle to moderately steep slopes, in some cases adjacent to unstable scree or talus. The small (often <1 acre) stands are often associated with *Grayia, Ephedra viridis, Gutierrezia microcephala* and *Opuntia eriantha*. Fire on the top of Ord Mountain has probably enhanced the species extent, but most individuals are associated with sufficient shrub cover to be considered understory herbs in a shrub alliance, rather than the dominant species in a predominantly herbaceous canopy...
5432 = *Pleuraphis jamesii* (James' galleta shrub-steppe) Alliance (not mapped and not inventoried in study area)

Achnatherum hymenoides is dominant; cover is usually <10% and stands transition to *Larrea tridentata* or *Larrea tridentata – Ambrosia dumosa* when shrubs become evenly distributed at >2% cover. Small stands are widely scattered throughout the mapping area often on dune aprons and other sandy soils. The most extensive stands seen were in the area east of Lucerne Lake and north of Old Woman Springs, but other smaller stands exist well westward. Stands that have <2% *Achnatherum hymenoides* and
>2% *Abronia* or *Dicoria* would key to the *Dicoria canescens - Abronia villosa*
- *Panicum urvilleanum* Alliance (6121*)...*
5433 = *Achnatherum hymenoides* (Indian rice grass grassland) Alliance

Sphaeralcea ambigua is dominant or co-dominant with other forbs and grasses, usually at >2% cover. Other associated plants include *Salvia columbariae, Bromus rubens, Lupinus* spp….
4125 = *Sphaeralcea (ambigua, coccinea, parvifolia)* (Desert globemallow scrub) Alliance

Sporobolus cryptandrus is dominant or co-dominant with other grasses and forbs, usually at >2% cover. Stands occur in sandy stream terraces and disturbed post-fire sites in mid-elevation valley bottoms. If in more upland dry grassland settings, see the other alliance of *Aristida purpurea - Elymus elymoides - Poa secunda* above…
***5434 = Sporobolus cryptandrus - Aristida purpurea var. longiseta - Poa secunda* (Sand Dropseed - Red three-awn - Curly blue grass grassland) Alliance** (not mapped and inventoried in study area)

APPENDIX H: CLASSIFICATION DESCRIPTIONS – Searles Valley and West Mojave Trails A

Table of Contents

TREE-OVERSTORY VEGETATION

Chilopsis linearis – Psorothamnus spinosus Woodland Alliance

Common Name: Desert-willow – smoketree wash woodland

NVC Alliance Code: A1044. *Chilopsis linearis - Psorothamnus spinosus* Desert Wash Scrub Alliance

Associations	**Sample Size**	**NVC Code**
Chilopsis linearis	5	CEGL001164
Chilopsis linearis / (Ambrosia eriocentra – Salvia dorrii)	7	CEGL005742
Chilopsis linearis / Ambrosia salsola	18	CEGL005744

Chilopsis linearis / Ericameria paniculata	13	CEGL005743
Chilopsis linearis / Prunus fasciculata	17	CEGL005745
Psorothamnus spinosus / Ambrosia salsola – (Bebbia juncea – Ephedra californica)	22	CEPP006745
Psorothamnus spinosus /Senegalia greggii – (Hyptis emoryi)	4	CEPP006744

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 977 m, Range 290 – 1510 m
Slope: Mean 3°, Range 0 – 20°
Aspect: Variable

Tree Cover: Mean 5.9%, Range 0 – 22%
Shrub Cover: Mean 11.9%, Range 1 – 28%
Herb Cover: Mean 3.2%, Range 0 – 23%

Surface Covers:

Large Rock: Mean 15.0%, Range 0 – 66%
Small Rock: Mean 71.1%, Range 0 – 100%
Fines: Mean 20.2%, Range 0 – 90%
Litter: Mean 3.6%, Range 0 – 23%

Conservation Status Rank: Global: G4; State (California): S3

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size		**13**	**73**	

Surveys Used in Description (N = 86): CAMO9110, CAMO9123, MOJA0351, MOJA0555, MOJA0566, MOJA0649, MOJA0801, MOJA0906, MOJA0927, MOJA9431, MOJA9440, MOJA9530, MOJA9591, MOJA9664, MOJA9915, MOJA9924, MOJAE011, MOJAE012, MOJAE013, MOJAE077, MOJAE078, MOJAE079, MOJAE090, MOJAE092, MOJAE096, MOJAE097, MOJAE098, MOJAE099, MOJAE100, MOJAE101, MOJAE102, MOJAE108, MOJAE109, MOJAE110, MOJAE111, MOJAE112, MOJAE113, MOJAE114, MOJAE115, MOJAE116, MOJAE117, MOJAE118, MOJAE147, MOJAE148, MOJAE149, MOJAE150, MOJAE151, MOJAE200, MOJAE206, MOJAE207, MOJAE209, MOJAE212, MOJAE213,

MOJAE214, MOJAE216, MOJAE217, MOJAE218, MOJAE219, MOJAE231, MOJAE232, MOJAE242, MOJAE246, MOJAE249, MOJAE250, MOJC0001, MOJC0161, MOJC0182, MOJC0185, MOJC0235, MOJC0286, MOJC0410, MOJC0914, MOJC1236, MOJD0104, MOJD0109, MOJD0110, MOJD0113, MOJD0115, MOJD0116, MOJDR104, MOJDR114, MOJJE043, MOJJE355, MOJJE358, MOJJE582, MOJJE597

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Chilopsis linearis	72	6.1	1.0	37.1				Y
	Psorothamnus spinosus	30	2.3	1.0	41.0				
Shrub									
	Hymenoclea salsola	76	4.2	0.2	47.0	Y			Y
	Senegalia greggii	71	1.2	0.2	11.0				Y
	Larrea tridentata	55	1.8	0.2	54.0				Y
	Stephanomeria pauciflora	45	0.1	0.2	1.1				
	Viguiera parishii	36	0.6	0.2	7.1				
	Eriogonum fasciculatum	36	0.1	0.0	1.1				
	Prunus fasciculata	30	1.3	0.2	20.0				
	Brickellia incana	29	0.3	0.2	3.6				
	Ambrosia eriocentra	28	0.5	0.2	6.1				
	Ambrosia dumosa	28	0.5	0.0	17.0				
	Phoradendron californicum	28	0.1	0.2	1.0				
	Ericameria paniculata	27	1.3	0.2	18.0				
	Bebbia juncea	27	0.2	0.0	4.5				
	Ephedra californica	26	0.8	0.2	28.0				
	Senecio flaccidus	26	0.1	0.2	2.0				
	Cylindropuntia acanthocarpa	26	0.1	0.1	3.0				
	Cleome isomeris	23	0.3	0.2	8.1				
	Gutierrezia sarothrae	22	0.1	0.2	2.0				
	Salvia dorrii	21	0.2	0.1	4.0				
	Yucca schidigera	21	0.1	0.1	1.0				
Herb									
	Bromus rubens	71	0.8	0.2	7.0				Y
	Erodium cicutarium	70	0.4	0.0	12.0				Y
	Schismus	64	0.8	0.2	8.0				Y
	Sphaeralcea ambigua	45	0.1	0.2	0.5				
	Mirabilis laevis	26	0.1	0.0	1.0				
	Eriogonum inflatum	23	0.1	0.2	0.5				
	Penstemon palmeri	21	0.1	0.0	1.5				

Non-vascular

Cryptogammic crust	21	0.1	0.2	5.0

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Chilopsis linearis / Ambrosia salsola Association

Common Name: Desert-willow / Cheesebush Association

Classification Comments: *Ambrosia salsola* and *Hymenoclea salsola* are synonymous.

Plot/Sample Data Summary:

Elevation: Mean 1083 m, Range 956 – 1176 m
Slope: Mean 3°, Range 2 – 5°
Aspect: Mostly south-facing

Tree Cover: Mean 6.5%, Range 1 – 22%
Shrub Cover: Mean 11.8%, Range 3 – 27%
Herb Cover: Mean 0.9%, Range 0 – 2%

Surface Covers:

Large Rock: Mean 3.4%, Range 0 – 12%
Small Rock: Mean 93.6%, Range 84 – 100%
Fines: Mean 30.9%, Range 0 – 55%
Litter: Mean 3.1%, Range 0 – 11%

Surveys Used in Description (N =18): MOJA9591, MOJA9915, MOJAE011, MOJAE012, MOJAE013, MOJAE206, MOJAE207, MOJAE209, MOJAE212, MOJAE213, MOJAE214, MOJAE216, MOJAE217, MOJAE218, MOJAE219, MOJAE249, MOJAE250, MOJJE043

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Chilopsis linearis	100	9.1	1.5	37.1	Y	Y		Y
Shrub									
	Hymenoclea salsola	100	6.5	1.0	47.0	Y		Y	Y
	Ephedra californica	83	3.3	0.2	28.0	Y			Y
	Cleome isomeris	83	1.3	0.2	8.1	Y			Y
	Senecio flaccidus	67	0.5	0.2	2.0				Y
	Brickellia incana	56	0.4	0.2	3.0				Y
	Senegalia greggii	56	0.4	0.2	3.0				Y
	Larrea tridentata	44	0.7	0.2	5.0				
	Eriogonum fasciculatum	33	0.1	0.2	0.2				
	Stephanomeria pauciflora	28	0.1	0.2	0.2				
	Eriogonum plumatella	22	0.2	0.2	3.0				
	Phoradendron	22	0.1	0.2	0.5				

	californicum								
	Cylindropuntia echinocarpa	22	0.0	0.2	0.2				
	Lycium andersonii	22	0.0	0.2	0.2				
Herb									
	Schismus	89	1.4	0.2	4.0	Y		Y	Y
	Bromus rubens	89	0.3	0.2	3.0	Y			Y
	Erodium cicutarium	89	0.3	0.2	1.0	Y			Y
	Adenophyllum cooperi	33	0.1	0.2	0.2				
	Mirabilis laevis	22	0.0	0.2	0.2				
	Sphaeralcea ambigua	22	0.0	0.2	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Psorothamnus spinosus / Ambrosia salsola – (Bebbia juncea – Ephedra californica) Association

Common Name: Smoketree - Cheesebush - Sweetbush Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 653 m, Range 321 – 928 m
Slope: Mean 3°, Range 0 – 20°
Aspect: Variable

Tree Cover: Mean 4.3%, Range 1 – 15%
Shrub Cover: Mean 7.2%, Range 1 – 17%
Herb Cover: Mean 4.4%, Range 0 – 10%

Surface Covers:

Large Rock: Mean 1.5%, Range 0 – 5%
Small Rock: Mean 77.7%, Range 38 – 98%
Fines: Mean 19.8%, Range 5 – 38%
Litter: Mean 2.6%, Range 0 – 10%

Surveys Used in Description (N =22): MOJA0555, MOJA0649, MOJA0801, MOJA0927, MOJAE231, MOJAE232, MOJC0001, MOJC0161, MOJC0182, MOJC0185, MOJC0286, MOJC0410, MOJD0104, MOJD0109, MOJD0110, MOJD0116, MOJDR104, MOJDR114, MOJJE355, MOJJE358, MOJJE582, MOJJE597

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Psorothamnus spinosus	100	8.5	1.1	41.0	Y	Y		Y
Shrub									
	Hymenoclea salsola	100	8.4	0.5	35.0	Y		Y	Y
	Larrea tridentata	77	5.3	0.2	54.0	Y			Y
	Senegalia greggii	68	1.1	0.2	11.0				Y
	Ambrosia dumosa	64	1.7	0.0	17.0				Y
	Bebbia juncea	41	0.7	0.0	4.5				
	Stephanomeria pauciflora	32	0.2	0.2	1.0				
	Ephedra californica	27	0.4	0.2	3.0				
	Ericameria paniculata	23	1.6	0.5	18.0				
	Encelia farinosa	23	0.2	0.2	1.5				
	Brickellia incana	23	0.2	0.2	3.0				
Herb									
	Schismus	73	0.5	0.2	2.0				Y

Erodium cicutarium	55	0.5	0.0	5.0		Y
Eriogonum inflatum	32	0.1	0.2	0.5		
Cryptantha angustifolia	27	0.2	0.2	1.0		
Camissonia brevipes	27	0.1	0.2	1.0		
Salvia columbariae	27	0.1	0.2	0.5		
Malacothrix glabrata	23	0.1	0.2	1.0		
Eschscholzia minutiflora	23	0.0	0.2	0.2		
Chamaesyce polycarpa	23	0.0	0.0	0.2		

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Psorothamnus spinosus /Senegalia greggii – (Hyptis emoryi) Association

Common Name: Smoketree - Desert Lavender - Catclaw Acacia Association
Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 474 m, Range 290 – 730 m
Slope: Mean 1°, Range 1 – 2°
Aspect: Variable

Tree Cover: 5%
Shrub Cover: Mean 6.8%, Range 4 – 12%
Herb Cover: Mean 4.3%, Range 1 – 7%

Surface Covers:

Large Rock: Mean 0.8%, Range 0 – 2%
Small Rock: Mean 72.1%, Range 48 – 85%
Fines: Mean 18.1%, Range 10 – 38%
Litter: Mean 1.7%, Range 0 – 3%

Surveys Used in Description (N =4): MOJC0235, MOJC0914, MOJD0113, MOJD0115

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Psorothamnus spinosus	100	2.1	1.0	3.0	Y	Y		Y
	Chilopsis linearis	25	0.5	2.0	2.0				
Shrub									
	Hymenoclea salsola	100	2.5	0.5	6.0	Y			Y
	Senegalia greggii	100	2.1	0.2	3.2	Y		Y	Y
	Larrea tridentata	75	1.4	0.5	4.0	Y			Y
	Encelia farinosa	75	0.4	0.2	1.0	Y			Y
	Bebbia juncea	75	0.4	0.2	1.0	Y			Y
	Ambrosia dumosa	50	0.2	0.2	0.5				Y
	Hyptis emoryi	25	0.5	2.0	2.0				
	Viguiera parishii	25	0.4	1.5	1.5				
	Ephedra californica	25	0.3	1.0	1.0				
	Stephanomeria pauciflora	25	0.1	0.5	0.5				
	Phoradendron californicum	25	0.1	0.5	0.5				
	Cylindropuntia echinocarpa	25	0.1	0.2	0.2				
	Encelia frutescens	25	0.1	0.2	0.2				
Herb									

Schismus	100	0.5	0.2	1.0	Y		Y
Cryptantha angustifolia	50	0.5	1.0	1.0			Y
Camissonia brevipes	50	0.5	1.0	1.0			Y
Lupinus arizonicus	50	0.5	1.0	1.0			Y
Perityle emoryi	50	0.2	0.2	0.5			Y
Monoptilon	50	0.1	0.2	0.2			Y
Atrichoseris platyphylla	50	0.1	0.2	0.2			Y
Eschscholzia minutiflora	50	0.1	0.2	0.2			Y
Cuscuta	50	0.1	0.2	0.2			Y
Plant	25	0.1	0.5	0.5			
Asteraceae	25	0.1	0.5	0.5			
Erodium cicutarium	25	0.1	0.5	0.5			
Geraea canescens	25	0.1	0.5	0.5			
Eriogonum	25	0.1	0.5	0.5			
Dasyochloa pulchella	25	0.1	0.5	0.5			
Cryptantha	25	0.1	0.5	0.5			
Palafoxia arida	25	0.1	0.5	0.5			
Chamaesyce albomarginata	25	0.1	0.5	0.5			
Camissonia claviformis	25	0.1	0.5	0.5			
Bouteloua eriopoda	25	0.1	0.5	0.5			
Eriogonum inflatum	25	0.1	0.5	0.5			
Chaenactis carphoclinia	25	0.1	0.2	0.2			
Plantago ovata	25	0.1	0.2	0.2			
Chorizanthe brevicornu	25	0.1	0.2	0.2			
Malacothrix glabrata	25	0.1	0.2	0.2			

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

North American Desert Tree Garden Cultural Type Woodland Alliance

Common Name: North American Desert Tree Garden Cultural Type

NVC Alliance Code: CTY022

Associations	Sample Size	NVC Code
Tamarix aphylla Scrub Plantation	3	CST006759

Classification Comments: The association circumscription is the same as that of the alliance.

Plot/Sample Data Summary:

Elevation: Mean 684 m, Range 595 – 732 m
Slope: 2°
Aspect: Variable

Tree Cover: Mean 74.7%, Range 63 – 81%
Shrub Cover: Mean 12.3%, Range 1 – 27%
Herb Cover: Mean 0.0%, Range 0 – 0%

Surface Covers:

Large Rock: 0%
Small Rock: 4%
Fines: 0%
Litter: 96%

Conservation Status Rank: Global: GNA; State (California): SNA

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**2**	**1**

Surveys Used in Description (N = 3): DEVA8002, DEVA8003, DEVA9348

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Tamarix aphylla	100	74.7	63.0	81.0	Y	Y		Y
Shrub									
	Nerium oleander	100	12.3	1.0	27.0	Y	Y		Y
	Larrea tridentata	33	0.1	0.2	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Parkinsonia florida – Olneya tesota Woodland Alliance

Common Name: Blue palo verde - Ironwood woodland

NVC Alliance Code: A0588

Associations	Sample Size	NVC Code
none	0	none

Classification Comments: No surveys of this alliance were recorded in the study area, however it appears in the vegetation map. See LaDoux et al. 2013 and Evens and Hartman 2007 for descriptions of this alliance.

Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Woodland Alliance

Common Name: Mesquite thickets

NVC Alliance Code: A3877. *Prosopis glandulosa - Prosopis velutina - Prosopis*

Associations	**Sample Size**	**NVC Code**
Prosopis glandulosa – (Salix exigua – Salix lasiolepis)	1	CEPP006860
Prosopis glandulosa – Prosopis velutina – Prosopis pubescens (alliance)	1	A3877
Prosopis glandulosa / (Atriplex spp. *– Suaeda moquinii)*	9	CEGL006861
Prosopis glandulosa / Pluchea sericea	1	CEPP006737
Prosopis glandulosa var. *torreyana*	5	CEGL001381

pubescens Wet Scrub Alliance

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 578 m, Range 290 – 1389 m
Slope: Mean 13°, Range 1 – 70°
Aspect: Variable

Tree Cover: Mean 28.3%, Range 4 – 70%
Shrub Cover: Mean 25.1%, Range 3 – 67%
Herb Cover: Mean 14.4%, Range 0 – 70%

Surface Covers:

Large Rock: Mean 4.4%, Range 0 – 53%
Small Rock: Mean 9.1%, Range 0 – 48%
Fines: Mean 67.5%, Range 3 – 95%
Litter: Mean 13.7%, Range 2 – 61%

Conservation Status Rank: Global: G5; **State (California):** S3

Surveys by Region:

Region	**SV**	**WMT**	**Other**	**Other**
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**5**		**12**	

Surveys Used in Description (N = 17): DEVAD037, MOJA9130, MOJA9190, MOJA9193, MOJA9195, MOJA9453, MOJA9646, MOJAE010, MOJC0007, MOJC0040, MOJC0041, MOJC0057, MOJC0371, MOJD0004, MOJD0007, MOJD0008, MOJDR004

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Prosopis glandulosa	100	29.6	4.0	80.5	Y	Y		Y
Shrub									
	Atriplex polycarpa	53	1.9	0.5	9.0				Y
	Phoradendron californicum	47	1.0	0.2	12.0				
	Suaeda moquinii	35	1.9	1.0	8.0				
	Larrea tridentata	29	0.3	0.1	4.0				
	Senegalia greggii	24	1.0	0.5	12.0				
	Atriplex canescens	24	0.9	1.0	8.0				
Herb									
	Schismus	41	5.3	0.2	70.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

SHRUB-OVERSTORY VEGETATION

Allenrolfea occidentalis Shrubland Alliance

Common Name: Iodine bush scrub

NVC Alliance Code: A0866. *Allenrolfea occidentalis* Wet Shrubland Alliance

Associations	Sample Size	NVC Code
Allenrolfea occidentalis	7	CEGL000988
Allenrolfea occidentalis – Suaeda moquinii	3	CEPP005787
Allenrolfea occidentalis / Distichlis spicata	1	CEPP005788

Classification Comments: None.

Plot/Sample Data Summary:
Elevation: Mean 341 m, Range 185 – 664 m
Slope: Mean 1°, Range 0 – 2°
Aspect: Mostly flat

Tree Cover: 0%
Shrub Cover: Mean 17.2%, Range 0 – 85%
Herb Cover: Mean 1.6%, Range 0 – 6%

Surface Covers:
Large Rock: Mean 0.5%, Range 0 – 5%
Small Rock: Mean 5.9%, Range 0 – 48%
Fines: Mean 81.0%, Range 0 – 100%
Litter: Mean 1.5%, Range 0 – 10%

Conservation Status Rank: Global: G4; **State (California):** S3

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**7**		**3**	**1**

Surveys Used in Description (N = 11): MOJA0196, MOJC0039, MOJC0719, MOJC0847, MOJC0854, MOJD0009, MOJD0013, MOJD0014, MOJD0015, MOJD0016, SLTN0729

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Allenrolfea occidentalis	100	15.2	0.2	85.0	Y	Y		Y
	Suaeda moquinii	73	0.9	0.1	5.0				Y
	Standing snag	36	0.7	0.2	5.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Allenrolfea occidentalis Association

Common Name: Iodine Bush Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 372 m, Range 290 – 664 m
Slope: Mean 1°, Range 0 – 2°
Aspect: Mostly flat

Tree Cover: 0%
Shrub Cover: Mean 17.4%, Range 0 – 85%
Herb Cover: Mean 1.2%, Range 0 – 5%

Surface Covers:

Large Rock: Mean 0.7%, Range 0 – 5%
Small Rock: Mean 6.9%, Range 0 – 48%
Fines: Mean 73.9%, Range 0 – 100%
Litter: Mean 1.9%, Range 0 – 10%

Surveys Used in Description (N =7): MOJA0196, MOJC0039, MOJC0719, MOJC0847, MOJD0013, MOJD0014, MOJD0016

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Allenrolfea occidentalis	100	17.0	0.2	85.0	Y	Y		Y
	Suaeda moquinii	57	0.3	0.1	1.0				Y
	Standing snag	29	0.2	0.2	1.0				
Herb									
	Schismus	29	0.2	0.2	1.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Allenrolfea occidentalis – Suaeda moquinii Association

Common Name: Bush Seepweed - Iodine Bush Association **Classification Comments:** None

Plot/Sample Data Summary:

Elevation: Mean 275 m, Range 185 – 321 m
Slope: 1°
Aspect: Mostly flat

Tree Cover: 0%
Shrub Cover: Mean 21.0%, Range 7 – 35%
Herb Cover: Mean 2.1%, Range 0 – 6%

Surface Covers:

Large Rock: 0%
Small Rock: Mean 5.7%, Range 0 – 10%
Fines: Mean 92.2%, Range 88 – 97%
Litter: Mean 0.2%, Range 0 – 0%

Surveys Used in Description (N =3): MOJC0854, MOJD0015, SLTN0729

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Allenrolfea occidentalis	100	13.5	4.5	30.0	Y	Y		Y
	Suaeda moquinii	100	2.8	1.0	5.0	Y			Y
	Standing snag	33	0.7	2.0	2.0				
	Atriplex polycarpa	33	0.1	0.2	0.2				
Herb									
	Frankenia salina	33	0.3	1.0	1.0				
	Distichlis spicata	33	0.1	0.2	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Allenrolfea occidentalis / Distichlis spicata Provisional Association

Common Name: Iodine Bush / Saltgrass Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: 321 m
Slope: 1°
Aspect: Southwest-facing

Tree Cover: 0%
Shrub Cover: 8%
Herb Cover: 3%

Surface Covers:

Large Rock: 0%
Small Rock: 0%
Fines: 98%
Litter: 2%

Surveys Used in Description (N =1): MOJD0009

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Allenrolfea occidentalis	100	8.0	8.0	8.0	Y	Y		Y
	Standing snag	100	5.0	5.0	5.0	Y		Y	Y
	Suaeda moquinii	100	0.1	0.1	0.1	Y			Y
Herb									
	Distichlis spicata	100	3.0	3.0	3.0	Y	Y		Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Allenrolfea occidentalis / Distichlis spicata Provisional Association

Ambrosia dumosa Shrubland Alliance

Common Name: White bursage scrub

NVC Alliance Code: A3279. *Ambrosia dumosa* Desert Dwarf Scrub Alliance

Associations	Sample Size	NVC Code
Ambrosia dumosa	29	CEGL005074
Ambrosia dumosa (alliance)	3	A3279

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 930 m, Range 339 – 1810 m
Slope: Mean 11°, Range 0 – 45°
Aspect: Mostly south-facing

Tree Cover: Mean 1.0%, Range 1 – 1%
Shrub Cover: Mean 11.3%, Range 1 – 20%
Herb Cover: Mean 9.5%, Range 2 – 27%

Surface Covers:

Large Rock: Mean 24.3%, Range 0 – 80%
Small Rock: Mean 49.2%, Range 3 – 100%
Fines: Mean 23.4%, Range 0 – 88%
Litter: Mean 1.6%, Range 0 – 8%

Conservation Status Rank: Global: G5; **State (California):** S5

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**2**	**3**	**23**	**4**

Surveys Used in Description (N = 32): DEVA9544, MOJA9547, MOJC0127, MOJC0564, MOJC0691, MOJC0762, MOJC0780, MOJC0913, MOJC1203, MOJC1204, MOJD0021, MOJD0105, MOJDR005, MOJJE041, MOJJE064, MOJJE107, MOJJE110, MOJJE123, MOJJE138, MOJJE139, MOJJE212, MOJJE301, MOJJE343, MOJJE351, MOJJE360, MOJJE443, MOJJE492, MOJJE493, MOJJE494, MOJJE5T1, MOJJE5T3, SLTN1048

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ambrosia dumosa	100	37.1	1.5	79.0	Y	Y		Y
	Larrea tridentata	84	4.3	0.1	16.0	Y			Y
	Krameria erecta	50	2.6	0.5	17.0				Y
	Eriogonum fasciculatum	44	1.9	0.2	17.0				
	Lycium andersonii	44	1.2	0.2	7.0				
	Ephedra nevadensis	34	0.7	0.2	4.0				
	Thamnosma montana	25	0.7	1.0	7.0				
	Encelia farinosa	22	1.5	0.5	19.0				
	Viguiera parishii	22	0.4	0.5	5.0				
Herb									
	Pleuraphis rigida	25	3.0	0.2	23.0				
	Xylorhiza tortifolia	22	0.8	0.5	12.0				
	Schismus	22	0.3	0.2	5.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Ambrosia dumosa Association

Common Name: White Bursage Association **Classification Comments:** None

Plot/Sample Data Summary:

Elevation: Mean 931 m, Range 339 – 1810 m
Slope: Mean 10°, Range 0 – 45°
Aspect: Variable

Tree Cover: 1%
Shrub Cover: Mean 10.4%, Range 1 – 20%
Herb Cover: Mean 8.7%, Range 2 – 27%

Surface Covers:

Large Rock: Mean 23.2%, Range 0 – 80%
Small Rock: Mean 49.8%, Range 3 – 100%
Fines: Mean 24.9%, Range 0 – 88%
Litter: Mean 1.4%, Range 0 – 8%

Surveys Used in Description (N =29): DEVA9544, MOJA9547, MOJC0127, MOJC0564, MOJC0691, MOJC0762, MOJC0780, MOJC0913, MOJC1203, MOJD0105, MOJJE041, MOJJE064, MOJJE107, MOJJE110, MOJJE123, MOJJE138, MOJJE139, MOJJE212, MOJJE301, MOJJE343, MOJJE351, MOJJE360, MOJJE443, MOJJE492, MOJJE493, MOJJE494, MOJJE5T1, MOJJE5T3, SLTN1048

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ambrosia dumosa	100	40.1	1.5	79.0	Y	Y		Y
	Larrea tridentata	83	4.7	0.1	16.0	Y			Y
	Krameria erecta	55	2.8	0.5	17.0				Y
	Eriogonum fasciculatum	41	2.1	1.0	17.0				
	Lycium andersonii	38	1.0	0.2	7.0				
	Ephedra nevadensis	38	0.7	0.2	4.0				
	Thamnosma montana	28	0.8	1.0	7.0				
	Encelia farinosa	21	1.5	0.5	19.0				
	Viguiera parishii	21	0.4	0.5	5.0				
	Senegalia greggii	21	0.4	0.5	5.0				
	Acamptopappus sphaerocephalus	21	0.4	0.5	4.0				
Herb									
	Pleuraphis rigida	28	3.3	0.2	23.0				
	Xylorhiza tortifolia	21	0.8	0.5	12.0				
	Eriogonum inflatum	21	0.1	0.1	2.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Ambrosia salsola – Bebbia juncea Shrubland Alliance

Common Name: Cheesebush – sweetbush scrub

NVC Alliance Code: A4188. *Hymenoclea salsola - Bebbia juncea* Mojave-Sonoran Desert Wash Scrub Alliance

Associations	Sample Size	NVC Code
Ambrosia eriocentra – Brickellia spp.	1	CEPP005790
Ambrosia salsola	27	CEGL005398
Ambrosia salsola – (Ambrosia eriocentra – Brickellia incana)	8	CEGL002702
Ambrosia salsola – Bebbia juncea (alliance)	1	A4188
Ambrosia salsola – Eriogonum fasciculatum	6	CEPP006711
Ambrosia salsola – Larrea tridentata	28	CEGL005753
Bebbia juncea	8	CEGL005391
Senna armata – Ambrosia salsola	14	CEPP006756

Classification Comments: None.

Plot/Sample Data Summary:
Elevation: Mean 948 m, Range 138 – 1502 m
Slope: Mean 4°, Range 0 – 25°
Aspect: Variable

Tree Cover: Mean 0.9%, Range 0 – 2%
Shrub Cover: Mean 11.4%, Range 2 – 24%
Herb Cover: Mean 3.0%, Range 0 – 18%

Surface Covers:
Large Rock: Mean 8.6%, Range 0 – 58%
Small Rock: Mean 72.4%, Range 10 – 97%
Fines: Mean 21.8%, Range 0 – 63%
Litter: Mean 1.8%, Range 0 – 12%

Conservation Status Rank: Global: G4; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA	Mojave	Mojave	Mojave	sGB

Section	322A	322A	322A	341F
Sample size		**4**	**86**	**3**

Surveys Used in Description (N = 93): DEVA9362, DEVA9432, DEVA9533, DEVAD015, DEVAD016, DEVAD040, MOJA0383, MOJA0506, MOJA9201, MOJA9593, MOJA9594, MOJA9621, MOJA9666, MOJA9667, MOJA9669, MOJA9673, MOJA9683, MOJA9800, MOJA9802, MOJAA018, MOJAE014, MOJAE015, MOJAE016, MOJAE018, MOJAE021, MOJAE224, MOJAE225, MOJAE226, MOJAE248, MOJAE251, MOJAE252, MOJAE253, MOJAE254, MOJAE255, MOJAE256, MOJAE257, MOJAE258, MOJAE259, MOJAE260, MOJAE261, MOJAE262, MOJAE263, MOJC0023, MOJC0128, MOJC0250, MOJC0287, MOJC0303, MOJC0396, MOJC0403, MOJC0409, MOJC0574, MOJC0735, MOJC0750, MOJC0823, MOJC0910, MOJC0966, MOJC1029, MOJC1032, MOJC1033, MOJC1034, MOJC1052, MOJC1066, MOJC1137, MOJC1230, MOJD0102, MOJD0103, MOJDR101, MOJDR105, MOJJE001, MOJJE006, MOJJE014, MOJJE040, MOJJE080, MOJJE092, MOJJE094, MOJJE102, MOJJE108, MOJJE111, MOJJE121, MOJJE134, MOJJE149, MOJJE165, MOJJE191, MOJJE196, MOJJE199, MOJJE325, MOJJE338, MOJJE539, MOJJE544, MOJJE546, MOJJE586, MOJJE642, SLTN0535

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Hymenoclea salsola	95	12.4	0.5	65.0	Y		Y	Y
	Larrea tridentata	73	3.3	0.1	33.0				Y
	Ambrosia dumosa	54	0.8	0.1	14.0				Y
	Senegalia greggii	48	1.8	0.2	22.0				
	Eriogonum fasciculatum	43	0.7	0.2	11.0				
	Senna armata	35	3.6	0.2	45.0				
	Salazaria mexicana	30	0.5	0.1	10.0				
	Ephedra nevadensis	29	0.8	0.1	11.0				
	Cylindropuntia acanthocarpa	29	0.6	0.0	16.0				
	Thamnosma montana	28	0.8	0.1	19.0				
	Lycium andersonii	26	0.4	0.2	19.0				
	Bebbia juncea	23	0.5	0.1	7.5				
	Krameria grayi	23	0.1	0.2	2.0				
	Stephanomeria pauciflora	22	0.1	0.2	5.0				
	Ambrosia eriocentra	20	1.0	0.2	28.0				
	Salvia dorrii	20	0.7	0.1	12.0				
Herb									
	Schismus	55	1.2	0.2	55.0				Y
	Erodium cicutarium	48	0.4	0.2	4.0				
	Bromus rubens	41	0.4	0.1	7.0				

Eriogonum inflatum	30	0.1	0.1	0.5
Mirabilis laevis	27	0.1	0.2	0.5

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Ambrosia salsola Association

Common Name: Cheesebush Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 854 m, Range 138 – 1502 m
Slope: Mean 4°, Range 0 – 18°
Aspect: Variable

Tree Cover: Mean 0.6%, Range 0 – 1%
Shrub Cover: Mean 9.2%, Range 2 – 21%
Herb Cover: Mean 3.5%, Range 0 – 18%

Surface Covers:

Large Rock: Mean 3.9%, Range 0 – 20%
Small Rock: Mean 64.5%, Range 30 – 97%
Fines: Mean 32.4%, Range 3 – 63%
Litter: Mean 2.0%, Range 0 – 12%

Surveys Used in Description (N =27): DEVA9432, DEVAD015, DEVAD016, DEVAD040, MOJA0383, MOJA9669, MOJA9800, MOJAE015, MOJAE018, MOJAE224, MOJC0250, MOJC0303, MOJC0403, MOJC0750, MOJC0910, MOJC0966, MOJC1029, MOJC1066, MOJDR101, MOJDR105, MOJJE006, MOJJE014, MOJJE092, MOJJE094, MOJJE539, MOJJE544, SLTN0535

Association Stand Table:

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Hymenoclea salsola	100	15.6	1.5	65.0	Y	Y		Y
	Larrea tridentata	56	0.3	0.1	1.0				Y
	Ambrosia dumosa	44	0.3	0.1	1.5				
	Senegalia greggii	37	1.1	0.2	12.0				
	Ericameria cooperi	22	1.4	1.0	13.0				
	Ephedra nevadensis	22	1.0	0.2	11.0				
	Cylindropuntia acanthocarpa	22	0.8	0.0	16.0				
	Salvia dorrii	22	0.7	0.2	8.0				
	Atriplex hymenelytra	22	0.3	0.1	5.0				
	Bebbia juncea	22	0.2	0.1	3.0				
	Lycium andersonii	22	0.2	0.2	1.5				
Herb									

Schismus	52	2.8	0.2	55.0	Y
Erodium cicutarium	37	0.6	0.5	4.0	
Bromus rubens	37	0.6	0.1	6.0	
Pleuraphis rigida	22	1.9	0.5	20.0	
Eriogonum inflatum	22	0.1	0.1	0.5	

Ambrosia salsola – Eriogonum fasciculatum Association

Common Name: Cheesebush-California Buckwheat Association **Classification Comments:** None

Plot/Sample Data Summary:

Elevation: Mean 1194 m, Range 911 – 1453 m
Slope: Mean 2°, Range 1 – 2°
Aspect: Mostly south-facing

Tree Cover: 1%
Shrub Cover: Mean 12.5%, Range 6 – 16%
Herb Cover: Mean 5.5%, Range 2 – 12%

Surface Covers:

Large Rock: Mean 2.4%, Range 0 – 6%
Small Rock: Mean 93.0%, Range 87 – 97%
Fines: Mean 18.3%, Range 3 – 38%
Litter: Mean 1.6%, Range 0 – 3%

Surveys Used in Description (N =6): MOJA0506, MOJA9673, MOJAE225, MOJAE226, MOJJE080, MOJJE102

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Hymenoclea salsola	100	12.3	3.0	33.0	Y		Y	Y
	Eriogonum fasciculatum	100	3.8	2.0	7.0	Y			Y
	Coleogyne ramosissima	67	2.4	0.5	8.0				Y
	Senegalia greggii	67	1.4	0.2	5.0				Y
	Lycium cooperi	67	1.1	1.0	3.0				Y
	Salvia dorrii	50	2.8	3.0	10.0				Y
	Ephedra nevadensis	50	1.5	2.0	5.0				Y
	Yucca baccata	50	0.7	0.2	3.0				Y
	Thamnosma montana	50	0.2	0.1	1.0				Y
	Gutierrezia microcephala	33	3.7	10.0	12.0				
	Cylindropuntia acanthocarpa	33	2.2	0.1	13.0				
	Ericameria cooperi	33	1.5	0.2	9.0				
	Prunus fasciculata	33	1.1	0.5	6.0				
	Tetradymia stenolepis	33	0.9	0.1	5.0				
	Salazaria mexicana	33	0.8	1.0	4.0				
	Ericameria linearifolia	33	0.7	0.2	4.0				
	Gutierrezia sarothrae	33	0.5	0.2	3.0				
	Lycium andersonii	33	0.5	0.2	3.0				

	Cylindropuntia echinocarpa	33	0.4	0.1	2.0	
	Senecio flaccidus	33	0.2	0.2	1.1	
	Brickellia incana	33	0.1	0.2	0.2	
	Petalonyx thurberi	33	0.1	0.2	0.2	
	Atriplex canescens	33	0.1	0.2	0.2	
	Larrea tridentata	33	0.1	0.2	0.2	
	Ambrosia dumosa	33	0.1	0.2	0.2	
	Encelia frutescens	33	0.1	0.2	0.2	
	Ephedra californica	33	0.1	0.2	0.2	
Herb						
	Erodium cicutarium	67	0.9	0.2	3.0	Y
	Pleuraphis rigida	33	2.3	1.0	13.0	
	Bromus rubens	33	1.3	1.0	7.0	
	Schismus	33	0.2	0.2	1.0	
	Cryptantha	33	0.1	0.2	0.5	
	Mirabilis multiflora	33	0.1	0.2	0.2	

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Ambrosia salsola – Larrea tridentata Association

Common Name: Cheesebush – Creosote Bush Association **Classification Comments:** None

Plot/Sample Data Summary:

Elevation: Mean 920 m, Range 499 – 1298 m
Slope: Mean 3°, Range 0 – 5°
Aspect: Mostly west-facing

Tree Cover: Mean 0.7%, Range 0 – 1%
Shrub Cover: Mean 11.6%, Range 6 – 22%
Herb Cover: Mean 2.2%, Range 0 – 6%

Surface Covers:

Large Rock: Mean 8.2%, Range 0 – 23%
Small Rock: Mean 78.9%, Range 10 – 95%
Fines: Mean 17.9%, Range 0 – 63%
Litter: Mean 1.7%, Range 0 – 7%

Surveys Used in Description (N =28): DEVA9362, MOJA9593, MOJA9594, MOJA9666, MOJAE014, MOJAE016, MOJAE021, MOJAE251, MOJAE255, MOJAE257, MOJAE258, MOJAE259, MOJAE260, MOJAE261, MOJAE262, MOJAE263, MOJC0409, MOJC0735, MOJC0823, MOJC1052, MOJC1137, MOJD0102, MOJD0103, MOJJE001, MOJJE191, MOJJE338, MOJJE546, MOJJE586

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Hymenoclea salsola	100	12.9	1.5	63.0	Y		Y	Y
	Larrea tridentata	100	5.0	1.0	33.0	Y			Y
	Ambrosia dumosa	75	1.4	0.2	14.0	Y			Y
	Krameria grayi	46	0.3	0.2	2.0				
	Senegalia greggii	43	1.6	0.2	17.0				
	Senna armata	39	0.7	0.2	13.0				
	Salazaria mexicana	39	0.2	0.2	3.0				
	Eriogonum fasciculatum	39	0.1	0.2	1.0				
	Encelia virginensis	36	0.3	0.2	2.5				
	Psorothamnus arborescens	36	0.3	0.2	2.5				
	Stephanomeria pauciflora	36	0.1	0.2	1.0				
	Lycium andersonii	32	0.8	0.2	19.0				
	Ephedra nevadensis	29	0.3	0.2	4.0				
	Cleome isomeris	29	0.1	0.2	1.0				

	Cylindropuntia ramosissima	25	0.1	0.2	2.0		
	Ephedra californica	21	0.9	0.2	18.0		
	Bebbia juncea	21	0.2	0.2	3.0		
	Cylindropuntia acanthocarpa	21	0.0	0.2	0.2		
Herb							
	Schismus	75	0.7	0.2	4.0	Y	Y
	Erodium cicutarium	57	0.3	0.2	1.0		Y
	Mirabilis laevis	46	0.1	0.2	0.5		
	Bromus rubens	39	0.1	0.2	1.0		
	Eriogonum inflatum	39	0.1	0.2	0.5		
	Adenophyllum cooperi	32	0.1	0.2	0.5		
	Salvia columbariae	21	0.1	0.2	0.5		
Non-vascular							
	Cryptogammic crust	25	0.1	0.2	0.5		

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Senna armata – Ambrosia salsola Association

Common Name: Spiny Senna – Cheesebush Association **Classification Comments:** None

Plot/Sample Data Summary:

Elevation: Mean 1057 m, Range 858 – 1272 m
Slope: Mean 4°, Range 2 – 7°
Aspect: Mostly south-facing

Tree Cover: 0%
Shrub Cover: Mean 14.8%, Range 5 – 22%
Herb Cover: Mean 5.0%, Range 3 – 8%

Surface Covers:

Large Rock: Mean 1.6%, Range 0 – 6%
Small Rock: Mean 68.1%, Range 35 – 92%
Fines: Mean 26.3%, Range 2 – 63%
Litter: Mean 4.4%, Range 0 – 12%

Surveys Used in Description (N =14): MOJA9667, MOJA9683, MOJA9802, MOJC0023, MOJC0287, MOJJE040, MOJJE108, MOJJE111, MOJJE121, MOJJE134, MOJJE149, MOJJE196, MOJJE199, MOJJE325

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Senna armata	**100**	**22.3**	**2.0**	**45.0**	Y		Y	Y
	Larrea tridentata	93	9.7	1.0	30.0	Y			Y
	Hymenoclea salsola	**86**	**11.0**	**0.5**	**47.0**	Y			Y
	Senegalia greggii	79	5.2	0.5	22.0	Y			Y
	Thamnosma montana	71	3.4	0.2	11.0				Y
	Ambrosia dumosa	57	1.3	1.0	4.0				Y
	Eriogonum fasciculatum	43	1.5	0.2	11.0				
	Krameria erecta	43	1.4	0.5	8.0				
	Salazaria mexicana	43	1.2	1.0	5.0				
	Cylindropuntia acanthocarpa	36	1.3	0.2	12.0				
	Ephedra nevadensis	36	1.0	0.5	6.0				
	Ephedra californica	29	1.3	0.5	9.0				
	Brickellia incana	29	0.7	0.2	7.0				
	Acamptopappus sphaerocephalus	29	0.4	0.2	2.0				
	Cylindropuntia ramosissima	29	0.4	0.5	3.0				

	Yucca schidigera	29	0.1	0.2	1.0
	Ambrosia eriocentra	21	1.1	1.0	8.0
	Viguiera parishii	21	0.6	1.0	6.0
	Salvia dorrii	21	0.5	0.2	6.0
	Echinocereus engelmannii	21	0.4	0.2	4.0
	Ferocactus cylindraceus	21	0.4	0.2	4.0
	Krameria grayi	21	0.1	0.2	0.5
	Cylindropuntia echinocarpa	21	0.1	0.2	0.5
Herb					
	Erodium cicutarium	36	0.4	0.5	3.0
	Schismus	29	0.3	0.2	2.0
	Amsinckia	21	0.1	0.5	1.0
	Bromus rubens	21	0.1	0.2	0.5
	Salvia columbariae	21	0.1	0.2	0.5
	Adenophyllum cooperi	32	0.1	0.2	0.5
	Salvia columbariae	21	0.1	0.2	0.5

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Amphipappus fremontii – Salvia funerea Shrubland Alliance

Common Name: Fremont's chaffbush – woolly sage scrub

NVC Alliance Code: A4159. *Amphipappus fremontii - Salvia funerea* Scrub Alliance

Associaitons	**Sample Size**	**NVC Code**
Amphipappus fremontii (limestone)	1	CEPP005791
Salvia funerea	3	CEPP006754

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 566 m, Range 280 – 1198 m
Slope: Mean 36°, Range 33 – 40°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 4.6%, Range 1 – 12%
Herb Cover: Mean 6.8%, Range 4 – 8%

Surface Covers:

Large Rock: Mean 35.3%, Range 9.0 – 52%
Small Rock: Mean 45.7%, Range 37 – 56%
Fines: Mean 5.0%, Range 1 – 11%
Litter: Mean 1.5%, Range 0 – 4%

Conservation Status Rank: Global: G3; **State (California):** S3

Surveys by Region:

Region	**SV**	**WMT**	**Other**	**Other**
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size		**3**		**1**

Surveys Used in Description (N = 4): DEVA9360, MOJD0112, MOJD0114, MOJDR118

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	100	0.2	0.2	0.2	Y			Y
	Encelia farinosa	75	1.1	0.2	2.0	Y			Y
	Salvia funerea	75	0.6	0.2	1.0	Y			Y

	Standing snag	50	0.5	1.0	1.0			Y
	Fagonia laevis	50	0.1	0.2	0.2			Y
	Tidestromia	50	0.1	0.2	0.2			Y
	Amphipappus fremontii	25	1.8	7.0	7.0			
	Eriogonum fasciculatum	25	0.3	1.0	1.0			
	Chrysothamnus viscidiflorus	25	0.3	1.0	1.0			
	Atriplex confertifolia	25	0.3	1.0	1.0			
	Brickellia microphylla	25	0.1	0.2	0.2			
	Salazaria mexicana	25	0.1	0.2	0.2			
	Ambrosia dumosa	25	0.1	0.2	0.2			
	Pleurocoronis pluriseta	25	0.1	0.2	0.2			
	Brickellia arguta	25	0.1	0.2	0.2			
	Ferocactus cylindraceus	25	0.1	0.2	0.2			
	Viguiera reticulata	25	0.1	0.2	0.2			
	Lepidium fremontii	25	0.1	0.2	0.2			
	Stephanomeria pauciflora	25	0.1	0.2	0.2			
	Ephedra viridis	25	0.1	0.2	0.2			
	Echinocactus polycephalus	25	0.1	0.2	0.2			
Herb								
	Perityle emoryi	75	3.8	5.0	5.0	Y	Y	Y
	Eriogonum	75	0.2	0.2	0.2	Y		Y
	Cryptantha angustifolia	50	0.3	0.2	1.0			Y
	Cryptantha	50	0.2	0.2	0.4			Y
	Atrichoseris platyphylla	50	0.1	0.2	0.2			Y
	Aristida adscensionis	50	0.1	0.2	0.2			Y
	Chorizanthe brevicornu	50	0.1	0.2	0.2			Y
	Phacelia crenulata	50	0.1	0.2	0.2			Y
	Lepidium lasiocarpum	50	0.1	0.2	0.2			Y
	Cryptantha maritima	50	0.1	0.2	0.2			Y
	Chorizanthe rigida	50	0.1	0.2	0.2			Y
	Plantago ovata	25	0.5	2.0	2.0			
	Ipomopsis polycladon	25	0.1	0.2	0.2			
	Chorizanthe	25	0.1	0.2	0.2			
	Cryptantha utahensis	25	0.1	0.2	0.2			
	Eriogonum inflatum	25	0.1	0.2	0.2			
	Oxytheca perfoliata	25	0.1	0.2	0.2			
	Eriogonum trichopes	25	0.1	0.2	0.2			
	Gilia	25	0.1	0.2	0.2			
	Oligomeris linifolia	25	0.1	0.2	0.2			
	Dalea mollissima	25	0.1	0.2	0.2			

	Camissonia	25	0.1	0.2	0.2			
	Achnatherum speciosum	25	0.1	0.2	0.2			
	Schismus	25	0.1	0.2	0.2			
	Sphaeralcea ambigua	25	0.1	0.2	0.2			
	Vulpia	25	0.1	0.2	0.2			
	Bromus rubens	25	0.1	0.2	0.2			
	Senecio mohavensis	25	0.1	0.2	0.2			
	Prenanthella exigua	25	0.1	0.2	0.2			
	Poa	25	0.1	0.2	0.2			
	Phacelia vallis-mortae	25	0.1	0.2	0.2			
	Physalis crassifolia	25	0.1	0.2	0.2			
	Phacelia	25	0.1	0.2	0.2			
	Eriogonum nidularium	25	0.1	0.2	0.2			
	Xylorhiza tortifolia	25	0.1	0.2	0.2			
Non-vascular								
	Cryptogammic crust	75	1.3	0.2	3.0	Y	Y	Y
	Lichen	25	0.3	1.0	1.0			

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Salvia funerea Provisional Association

Common Name: Death Valley Sage Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 355 m, Range 280 – 486 m
Slope: Mean 37°, Range 35 – 40°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 2.2%, Range 1 – 3%
Herb Cover: Mean 7.7%, Range 7 – 8%

Surface Covers:

Large Rock: Mean 48.5%, Range 45 – 52%
Small Rock: Mean 40.5%, Range 37 – 44%
Fines: Mean 7.0%, Range 3 – 11%
Litter: Mean 0.2%, Range 0 – 0%

Surveys Used in Description (N =3): MOJD0112, MOJD0114, MOJDR118

Association Stand Table:

Layer Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub								
Encelia farinosa	100	1.4	0.2	2.0	X		X	X
Salvia funerea	**100**	**0.7**	**0.2**	**1.0**	**X**			**X**
Larrea tridentata	100	0.2	0.2	0.2	X			X
Standing snag	67	0.7	1.0	1.0				X
Tidestromia	67	0.1	0.2	0.2				X
Fagonia laevis	67	0.1	0.2	0.2				X
Pleurocoronis pluriseta	33	0.1	0.2	0.2				
Ferocactus cylindraceus	33	0.1	0.2	0.2				
Herb								
Perityle emoryi	100	5.0	5.0	5.0	X	X		X
Cryptantha angustifolia	67	0.4	0.2	1.0				X
Cryptantha maritima	67	0.1	0.2	0.2				X
Phacelia crenulata	67	0.1	0.2	0.2				X
Lepidium lasiocarpum	67	0.1	0.2	0.2				X
Eriogonum	67	0.1	0.2	0.2				X
Aristida adscensionis	67	0.1	0.2	0.2				X
Atrichoseris platyphylla	67	0.1	0.2	0.2				X
Plantago ovata	33	0.7	2.0	2.0				
Cryptantha	33	0.1	0.4	0.4				

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
	Chorizanthe rigida	33	0.1	0.2	0.2				
	Chorizanthe brevicornu	33	0.1	0.2	0.2				
	Senecio mohavensis	33	0.1	0.2	0.2				
	Eriogonum inflatum	33	0.1	0.2	0.2				
	Schismus	33	0.1	0.2	0.2				
	Physalis crassifolia	33	0.1	0.2	0.2				
	Dalea mollissima	33	0.1	0.2	0.2				
	Chorizanthe	33	0.1	0.2	0.2				
	Oligomeris linifolia	33	0.1	0.2	0.2				
Non-vascular									
	Cryptogammic crust	67	1.7	2.0	3.0				X
	Lichen	33	0.3	1.0	1.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Atriplex canescens Shrubland Alliance

Common Name: Fourwing saltbush scrub

NVC Alliance Code: A0869. *Atriplex canescens* Scrub Alliance

Classification Comments: The association circumscription is the same as that of the alliance.

Associations	Sample Size	NVC Code
Atriplex canescens	7	CEGL001281

Plot/Sample Data Summary:

Elevation: Mean 1237 m, Range 296 – 1907 m
Slope: Mean 3°, Range 0 – 14°
Aspect: Mostly flat

Tree Cover: Mean 0.2%, Range 0 – 0%
Shrub Cover: Mean 11.8%, Range 8 – 17%
Herb Cover: Mean 7.6%, Range 1 – 23%

Surface Covers:

Large Rock: Mean 1.5%, Range 0 – 10%
Small Rock: Mean 20.1%, Range 0 – 59%
Fines: Mean 65.2%, Range 20 – 92%
Litter: Mean 11.1%, Range 0 – 31%

Conservation Status Rank: Global: G5; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**3**	**4**

Surveys Used in Description (N = 7): CAMO9134, DEVA9153, DEVA9162, DEVA9356, MOJA9651, MOJC0725, SLTN0734

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Atriplex canescens	100	8.6	1.5	16.0	Y	Y		Y
	Suaeda moquinii	29	0.5	0.5	3.0				
	Ephedra nevadensis	29	0.4	0.5	2.0				
	Hymenoclea salsola	29	0.2	0.2	1.0				

	Stephanomeria pauciflora	29	0.1	0.2	0.2
	Krascheninnikovia lanata	29	0.0	0.1	0.2
Herb					
	Eriogonum deflexum	43	0.2	0.2	1.0
	Bromus rubens	43	0.1	0.2	0.2
	Bromus tectorum	29	2.0	0.2	14.0
	Eriogonum inflatum	29	0.5	0.2	3.0
	Mentzelia albicaulis	29	0.3	0.2	2.0
	Chaenactis	29	0.1	0.2	0.2
	Phacelia fremontii	29	0.1	0.2	0.2
	Achnatherum hymenoides	29	0.1	0.2	0.2
	Salsola	29	0.0	0.1	0.2
	Amsinckia	29	0.0	0.1	0.2

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Atriplex confertifolia Shrubland Alliance

Common Name: Shadscale scrub

NVC Alliance Code: A0870. *Atriplex confertifolia* Scrub Alliance

Associaitons	Sample Size	NVC Code
Atriplex confertifolia – Ambrosia dumosa	10	CEGL005739
Atriplex confertifolia – Krascheninnikovia lanata	1	CEGL001301
Atriplex confertifolia – Lepidium fremontii	3	CEPP005796
Atriplex confertifolia – Lycium andersonii	10	CEGL001308
Atriplex confertifolia – Picrothamnus desertorum	2	CEGL001295

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 1431 m, Range 589 – 1614 m
Slope: Mean 12°, Range 1 – 34°
Aspect: Variable

Tree Cover: Mean 0.7%, Range 0 – 2%
Shrub Cover: Mean 14.8%, Range 7 – 43%
Herb Cover: Mean 4.8%, Range 0 – 18%

Surface Covers:

Large Rock: Mean 9.5%, Range 0 – 58%
Small Rock: Mean 64.2%, Range 0 – 95%
Fines: Mean 17.5%, Range 0 – 63%
Litter: Mean 1.8%, Range 0 – 8%

Conservation Status Rank: Global: G5; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**1**		**3**	**22**

Surveys Used in Description (N = 26): DEVA9152, DEVA9171, DEVA9274, DEVA9355, DEVAD169, DEVAS074, DEVAS188, MOJC0485, MOJC0486, MOJC0487, MOJC0495, MOJC0496, MOJC0595, MOJC0690, MOJC0928,

MOJC0929, MOJC0934, MOJC0935, MOJC0967, MOJC0972, MOJC0973, MOJC1017, MOJC1018, MOJC1092, MOJD0020, SLTN0964

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Yucca brevifolia	35	0.2	0.1	2.0				
Shrub									
	Atriplex confertifolia	100	4.3	1.0	12.0	Y		Y	Y
	Lycium andersonii	73	1.5	0.2	5.0				Y
	Ambrosia dumosa	62	1.5	0.1	8.0				Y
	Lepidium fremontii	62	0.7	0.5	3.0				Y
	Ephedra nevadensis	46	0.5	0.1	2.5				
	Hymenoclea salsola	42	0.7	0.2	5.5				
	Psorothamnus arborescens	38	0.5	0.1	4.0				
	Picrothamnus desertorum	35	0.7	0.2	10.0				
	Menodora spinescens	35	0.6	0.1	5.0				
	Krascheninnikovia lanata	31	0.5	0.2	4.0				
	Opuntia basilaris	31	0.1	0.1	0.5				
	Stephanomeria pauciflora	31	0.1	0.2	0.5				
	Larrea tridentata	23	0.4	0.5	2.5				
Herb									
	Eriogonum inflatum	85	0.4	0.1	1.0	Y			Y
	Bromus rubens	77	0.5	0.1	3.0	Y			Y
	Xylorhiza tortifolia	65	0.3	0.1	1.0				Y
	Sphaeralcea ambigua	62	0.3	0.2	0.5				Y
	Mirabilis laevis	38	0.2	0.2	0.5				
	Achnatherum hymenoides	35	0.2	0.1	1.0				
	Achnatherum speciosum	27	0.2	0.2	2.0				
	Bromus tectorum	23	0.2	0.5	3.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Atriplex confertifolia – Lepidium fremontii Association

Common Name: Shadscale – Desert Pepper Grass Association **Classification Comments:** None

Plot/Sample Data Summary:

Elevation: Mean 1079 m, Range 589 – 1593 m
Slope: Mean 13°, Range 3 – 25°
Aspect: Variable

Tree Cover: 1%
Shrub Cover: Mean 10.8%, Range 7 – 15%
Herb Cover: Mean 3.7%, Range 1 – 8%

Surface Covers:

Large Rock: Mean 1.6%, Range 0 – 3%
Small Rock: Mean 65.6%, Range 45 – 79%
Fines: Mean 27.0%, Range 7 – 54%
Litter: Mean 1.8%, Range 0 – 5%

Surveys Used in Description (N =3): DEVA9274, MOJC1092, MOJD0020

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Yucca brevifolia	33	0.3	1.0	1.0				
Shrub									
	Atriplex confertifolia	100	3.5	3.0	4.0	Y		Y	Y
	Lepidium fremontii	100	2.2	1.5	3.0	Y			Y
	Psorothamnus arborescens	67	1.4	0.2	4.0				Y
	Standing snag	33	0.3	1.0	1.0				
	Menodora spinescens	33	0.3	1.0	1.0				
	Atriplex hymenelytra	33	0.3	1.0	1.0				
	Eriogonum fasciculatum	33	0.3	1.0	1.0				
	Ephedra nevadensis	33	0.3	1.0	1.0				
	Suaeda moquinii	33	0.3	1.0	1.0				
	Viguiera reticulata	33	0.3	1.0	1.0				
	Krascheninnikovia lanata	33	0.2	0.5	0.5				
	Coleogyne ramosissima	33	0.2	0.5	0.5				
	Psorothamnus fremontii	33	0.2	0.5	0.5				
	Hymenoclea salsola	33	0.2	0.5	0.5				
	Grayia spinosa	33	0.2	0.5	0.5				
	Lycium pallidum	33	0.2	0.5	0.5				

	Lycium andersonii	33	0.1	0.2	0.2	
	Echinocactus polycephalus	33	0.1	0.2	0.2	
	Stephanomeria pauciflora	33	0.1	0.2	0.2	
Herb						
	Stanleya pinnata	67	0.4	0.2	1.0	Y
	Bromus rubens	67	0.2	0.2	0.5	Y
	Eriogonum inflatum	67	0.2	0.2	0.5	Y
	Camissonia boothii	67	0.1	0.2	0.2	Y
	Eriogonum	33	0.3	1.0	1.0	
	Sphaeralcea ambigua	33	0.2	0.5	0.5	
	Penstemon monoensis	33	0.2	0.5	0.5	
	Astragalus layneae	33	0.2	0.5	0.5	
	Elymus elymoides	33	0.2	0.5	0.5	
	Xylorhiza tortifolia	33	0.2	0.5	0.5	
	Achnatherum hymenoides	33	0.2	0.5	0.5	
	Rafinesquia neomexicana	33	0.1	0.2	0.2	
	Stephanomeria	33	0.1	0.2	0.2	
	Nama pusillum	33	0.1	0.2	0.2	
	Monoptilon	33	0.1	0.2	0.2	
	Schismus	33	0.1	0.2	0.2	
	Lasthenia gracilis	33	0.1	0.2	0.2	
	Malacothrix glabrata	33	0.1	0.2	0.2	
	Eriogonum deflexum	33	0.1	0.2	0.2	
	Achnatherum speciosum	33	0.1	0.2	0.2	
	Atrichoseris platyphylla	33	0.1	0.2	0.2	
	Nama demissum	33	0.1	0.2	0.2	
	Phacelia crenulata	33	0.1	0.2	0.2	
	Mentzelia albicaulis	33	0.1	0.2	0.2	
	Pectocarya	33	0.1	0.2	0.2	
	Chorizanthe rigida	33	0.1	0.2	0.2	
	Chaenactis carphoclinia	33	0.1	0.2	0.2	
	Lepidium flavum	33	0.1	0.2	0.2	
	Geraea canescens	33	0.1	0.2	0.2	
	Brassicaceae	33	0.1	0.2	0.2	
	Cryptantha	33	0.1	0.2	0.2	
	Enceliopsis covillei	33	0.1	0.2	0.2	
	Castilleja exserta	33	0.0	0.1	0.1	
Non-vascular						
	Lichen	33	0.1	0.2	0.2	

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max

= Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Atriplex polycarpa Shrubland Alliance

Common Name: Allscale scrub

NVC Alliance Code: A3174. *Atriplex polycarpa* Scrub Alliance

Associations	Sample Size	NVC Code
Atriplex polycarpa	20	CEGL001318

Classification Comments: The association circumscription is the same as that of the alliance.

Plot/Sample Data Summary:

Elevation: Mean 457 m, Range 121 – 1366 m
Slope: Mean 3°, Range 0 – 11°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 11.1%, Range 1 – 42%
Herb Cover: Mean 3.5%, Range 0 – 13%

Surface Covers:

Large Rock: Mean 3.2%, Range 0 – 30%
Small Rock: Mean 22.4%, Range 0 – 70%
Fines: Mean 60.8%, Range 0 – 88%
Litter: Mean 3.5%, Range 0 – 22%

Conservation Status Rank: Global: G4; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**6**	**1**	**11**	**2**

Surveys Used in Description (N = 20): DEVA9180, DEVA9962, MOJA9181, MOJA9645, MOJA9653, MOJC0008, MOJC0022, MOJC0026, MOJC0038, MOJC0864, MOJC1167, MOJC1235, MOJD0001, MOJD0002, MOJD0005, MOJDR001, MOJDR003, SLTN0420, SLTN0865, SLTN0959

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Atriplex polycarpa	100	9.6	1.0	40.0	Y	Y		Y
	Larrea tridentata	65	1.0	0.2	6.0				Y

	Suaeda moquinii	30	0.7	0.5	4.0
	Atriplex canescens	30	0.4	0.2	3.5
	Ambrosia dumosa	20	0.2	0.1	3.0
	Standing snag	20	0.2	0.2	2.0
Herb					
	Schismus	35	0.2	0.2	1.0
	Amsinckia	20	0.3	0.2	5.0
	Camissonia claviformis	20	0.1	0.2	1.0
	Camissonia	20	0.0	0.1	0.2

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Baccharis emoryi – Baccharis sergiloides Shrubland Alliance

Common Name: Emory's and Broom baccharis scrub

NVC Alliance Code: A3874. *Baccharis emoryi - Baccharis sergiloides* Wet Shrubland Alliance

Associaitons	Sample Size	NCV Code
Baccharis sergiloides	5	CEGL002953
Baccharis sergiloides – Prunus fasciculata – Rhus trilobata	7	CEPP005842
Baccharis sergiloides / (Muhlenbergia rigens – Typha domingensis)	10	CEPP005846

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 1272 m, Range 954 – 1511 m
Slope: Mean 7°, Range 1 – 20°
Aspect: Variable

Tree Cover: Mean 3.3%, Range 2 – 7%
Shrub Cover: Mean 36.5%, Range 7 – 91%
Herb Cover: Mean 11.7%, Range 1 – 36%

Surface Covers:

Large Rock: Mean 26.1%, Range 0 – 66%
Small Rock: Mean 40.8%, Range 4 – 73%
Fines: Mean 17.0%, Range 1 – 62%
Litter: Mean 12.4%, Range 1 – 67%

Conservation Status Rank: Global: G4; **State (California):** S3

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**22**	

Surveys Used in Description (N = 22): DEVA9189, MOJA0428, MOJA0919, MOJA0925, MOJA9132, MOJA9413, MOJA9418, MOJA9452, MOJA9583, MOJA9590, MOJA9908, MOJA9917, MOJAE003, MOJAE008, MOJAE196, MOJAE198, MOJAE201, MOJAE203, MOJAE204, MOJAE237, MOJAE238, MOJAE239

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Pinus monophylla	23	0.1	0.2	1.7				
Shrub									
	Baccharis sergiloides	100	27.2	5.6	75.0	Y	Y		Y
	Senegalia greggii	86	2.3	0.2	25.0	Y			Y
	Artemisia ludoviciana	68	0.4	0.2	2.1				Y
	Prunus fasciculata	64	1.8	0.2	8.0				Y
	Lotus rigidus	64	0.3	0.2	1.1				Y
	Eriogonum fasciculatum	59	0.2	0.2	1.0				Y
	Rhus trilobata	50	1.2	0.2	5.0				Y
	Gutierrezia microcephala	50	0.4	0.2	1.1				Y
	Tamarix ramosissima	50	0.1	0.1	1.0				Y
	Phoradendron californicum	41	0.5	0.2	7.0				
	Ericameria linearifolia	41	0.2	0.2	1.1				
	Cylindropuntia acanthocarpa	41	0.1	0.2	1.1				
	Brickellia californica	41	0.1	0.2	0.2				
	Ephedra viridis	36	0.1	0.2	1.0				
	Ferocactus cylindraceus	36	0.1	0.0	1.0				
	Yucca schidigera	36	0.1	0.2	0.2				
	Eriogonum wrightii	32	0.1	0.2	1.0				
	Larrea tridentata	32	0.1	0.0	1.0				
	Viguiera parishii	27	0.1	0.2	1.1				
	Lycium andersonii	27	0.1	0.2	1.1				
	Ericameria cuneata	27	0.1	0.2	0.2				
	Salazaria mexicana	23	0.2	0.2	3.0				
	Echinocereus engelmannii	23	0.0	0.2	0.2				
Herb									
	Bromus rubens	95	6.2	0.2	35.0	Y		Y	Y
	Erodium cicutarium	68	0.3	0.2	2.0				Y
	Sphaeralcea ambigua	68	0.1	0.2	0.2				Y
	Achnatherum speciosum	45	0.1	0.2	0.2				
	Muhlenbergia rigens	41	1.7	0.2	22.0				
	Typha	41	0.9	0.2	7.1				
	Schismus	41	0.3	0.2	3.0				
	Juncus macrophyllus	41	0.2	0.2	3.1				
	Aristida purpurea	41	0.1	0.2	0.2				
	Juncus mexicanus	36	0.3	0.2	3.0				

	Polypogon monspeliensis	36	0.1	0.2	1.0				
	Elymus elymoides	36	0.1	0.2	0.2				
	Oenothera caespitosa	36	0.1	0.2	0.2				
	Mimulus guttatus	32	0.4	0.2	6.0				
	Amsinckia	32	0.1	0.2	0.2				
	Cynodon dactylon	27	0.2	0.2	3.0				
	Sonchus oleraceus	27	0.1	0.2	1.0				
	Mirabilis laevis	27	0.1	0.2	0.2				
	Bromus tectorum	23	0.4	0.2	6.0				
	Cirsium neomexicanum	23	0.0	0.2	0.2				
Non-vascular									
	Moss	77	0.3	0.2	2.0	Y		Y	Y
	Algae	41	1.4	0.2	10.0				
	Lichen	27	0.1	0.2	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Baccharis sergiloides / (Muhlenbergia rigens – Typha domingensis) Association

Common Name: Broom Baccharis / (Deergrass – Southern Cattail) Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1237 m, Range 954 – 1511 m
Slope: Mean 8°, Range 4 – 20°
Aspect: Mostly south-facing

Tree Cover: Mean 4.3%, Range 2 – 7%
Shrub Cover: Mean 35.0%, Range 7 – 77%
Herb Cover: Mean 12.8%, Range 1 – 28%

Surface Covers:

Large Rock: Mean 32.8%, Range 0 – 66%
Small Rock: Mean 37.7%, Range 20 – 64%
Fines: Mean 9.8%, Range 1 – 20%
Litter: Mean 17.8%, Range 1 – 67%

Surveys Used in Description (N =10): MOJA0428, MOJA0919, MOJA0925, MOJA9452, MOJA9590, MOJAE003, MOJAE008, MOJAE201, MOJAE203, MOJAE204

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Prosopis glandulosa	40	1.1	0.2	5.0				
Shrub									
	Baccharis sergiloides	100	28.9	5.6	75.0	Y	Y		Y
	Senegalia greggii	100	1.4	0.2	7.0	Y			Y
	Lotus rigidus	80	0.3	0.2	1.1	Y			Y
	Eriogonum fasciculatum	70	0.2	0.2	1.0				Y
	Tamarix ramosissima	70	0.2	0.2	1.0				Y
	Gutierrezia microcephala	60	0.5	0.2	1.1				Y
	Artemisia ludoviciana	60	0.3	0.2	2.1				Y
	Prunus fasciculata	50	0.6	0.2	3.0				Y
	Phoradendron californicum	50	0.3	0.2	2.0				Y
	Viguiera parishii	50	0.2	0.2	1.1				Y
	Lycium andersonii	50	0.1	0.2	0.2				Y
	Yucca schidigera	50	0.1	0.2	0.2				Y
	Ephedra viridis	50	0.1	0.2	0.2				Y

	Brickellia californica	50	0.1	0.2	0.2			Y
	Ferocactus cylindraceus	50	0.1	0.0	0.2			Y
	Cylindropuntia acanthocarpa	40	0.2	0.2	1.1			
	Rhus trilobata	40	0.2	0.2	1.1			
	Larrea tridentata	40	0.1	0.0	1.0			
	Ericameria linearifolia	40	0.1	0.2	0.2			
	Ericameria cuneata	40	0.1	0.2	0.2			
	Hymenoclea salsola	30	0.2	0.2	1.1			
	Salix exigua	30	0.1	0.2	1.0			
	Echinocereus engelmannii	30	0.1	0.2	0.2			
	Cleome isomeris	20	0.2	0.2	2.0			
	Ephedra nevadensis	20	0.1	0.2	1.0			
	Senecio flaccidus	20	0.0	0.2	0.2			
	Encelia virginensis	20	0.0	0.2	0.2			
	Stephanomeria pauciflora	20	0.0	0.2	0.2			
	Salazaria mexicana	20	0.0	0.2	0.2			
Herb								
	Bromus rubens	100	4.3	1.0	12.0	Y	Y	Y
	Typha	80	1.9	0.2	7.1	Y		Y
	Erodium cicutarium	80	0.3	0.2	1.0	Y		Y
	Sphaeralcea ambigua	80	0.2	0.2	0.2	Y		Y
	Muhlenbergia rigens	70	3.7	0.2	22.0			Y
	Schismus	70	0.6	0.2	3.0			Y
	Aristida purpurea	70	0.1	0.2	0.2			Y
	Juncus macrophyllus	60	0.5	0.2	3.1			Y
	Cynodon dactylon	60	0.5	0.2	3.0			Y
	Oenothera caespitosa	60	0.1	0.2	0.2			Y
	Juncus mexicanus	50	0.5	0.2	3.0			Y
	Polypogon monspeliensis	50	0.2	0.2	1.0			Y
	Achnatherum speciosum	50	0.1	0.2	0.2			Y
	Mimulus guttatus	40	0.3	0.2	2.0			
	Sonchus oleraceus	40	0.1	0.2	0.2			
	Amsinckia	40	0.1	0.2	0.2			
	Elymus elymoides	40	0.1	0.2	0.2			
	Sisyrinchium halophilum	30	0.1	0.2	0.5			
	Oenothera primiveris	30	0.1	0.2	0.2			
	Bromus diandrus	30	0.1	0.2	0.2			
	Carex alma	30	0.1	0.2	0.2			
	Mirabilis laevis	30	0.1	0.2	0.2			
	Cirsium neomexicanum	30	0.1	0.2	0.2			

	Phacelia campanularia	30	0.1	0.2	0.2			
	Nicotiana obtusifolia	30	0.0	0.0	0.2			
	Juncus	20	0.3	0.5	2.0			
	Chamaesyce albomarginata	20	0.0	0.2	0.2			
	Datura wrightii	20	0.0	0.2	0.2			
	Cryptantha	20	0.0	0.2	0.2			
	Polypogon viridis	20	0.0	0.2	0.2			
	Melica imperfecta	20	0.0	0.2	0.2			
	Euphorbia	20	0.0	0.2	0.2			
	Salvia columbariae	20	0.0	0.2	0.2			
	Phacelia	20	0.0	0.2	0.2			
	Cryptantha virginensis	20	0.0	0.2	0.2			
	Penstemon stephensii	20	0.0	0.2	0.2			
	Astragalus nutans	20	0.0	0.2	0.2			
	Bothriochloa barbinodis	20	0.0	0.2	0.2			
	Cryptantha angustifolia	20	0.0	0.2	0.2			
	Dudleya pulverulenta	20	0.0	0.0	0.2			
Non-vascular								
	Moss	100	0.4	0.2	2.0	Y	Y	Y
	Algae	50	2.3	0.2	10.0			Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Coleogyne ramosissima Shrubland Alliance

Common Name: Black brush scrub

NVC Alliance Code: A3144. *Coleogyne ramosissima* Mojave Desert Scrub Alliance

Associations	Sample Size	NVC Code
Coleogyne ramosissima	8	CEGL001332
Coleogyne ramosissima – Ephedra spp.	13	CEGL005297
Coleogyne ramosissima – Ericameria teretifolia	1	CEPP005999
Coleogyne ramosissima – Eriogonum fasciculatum	30	CEGL001333
Coleogyne ramosissima – Larrea tridentata	3	CEGL002717
Coleogyne ramosissima – Lycium andersonii	12	CEGL005746
Coleogyne ramosissima (alliance)	1	A3144
Coleogyne ramosissima / Pleuraphis jamesii	1	CEGL001334

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 1427 m, Range 1004 – 2018 m
Slope: Mean 12°, Range 0 – 90°
Aspect: Variable

Tree Cover: Mean 0.9%, Range 0 – 3%
Shrub Cover: Mean 20.7%, Range 2 – 31%
Herb Cover: Mean 9.2%, Range 0 – 35%

Surface Covers:

Large Rock: Mean 6.9%, Range 0 – 55%
Small Rock: Mean 70.4%, Range 10 – 98%
Fines: Mean 12.1%, Range 0 – 75%
Litter: Mean 3.7%, Range 0 – 10%

Conservation Status Rank: Global: G5; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F

Sample size			**50**	**19**

Surveys Used in Description (N = 69): CAMO9108, CAMO9109, CAMO9132, DEVA9174, DEVA9176, DEVA9351, DEVA9354, DEVA9361, DEVA9400, DEVAD123, DEVAD251, DEVAS055, DEVAS119, MOJA0444, MOJA0454, MOJA0503, MOJA0505, MOJA9381, MOJA9389, MOJA9417, MOJA9447, MOJA9448, MOJA9597, MOJA9674, MOJA9689, MOJC0170, MOJC0268, MOJC0338, MOJC0339, MOJC0340, MOJC0341, MOJC0472, MOJC0473, MOJC0474, MOJC0635, MOJC0658, MOJC0660, MOJC1147, MOJC1149, MOJJE002, MOJJE004, MOJJE008, MOJJE010, MOJJE011, MOJJE018, MOJJE023, MOJJE025, MOJJE026, MOJJE061, MOJJE082, MOJJE084, MOJJE088, MOJJE126, MOJJE133, MOJJE135, MOJJE136, MOJJE146, MOJJE152, MOJJE156, MOJJE164, MOJJE194, MOJJE195, MOJJE207, MOJJE407, MOJJE421, MOJJE422, MOJJE444, MOJJE647, SLTN0622

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Coleogyne ramosissima	100	19.6	2.0	74.0	Y		Y	Y
	Ephedra nevadensis	83	3.1	0.2	15.0	Y			Y
	Eriogonum fasciculatum	74	4.0	0.1	33.0				Y
	Eriogonum fasciculatum	74	4.0	0.1	33.0				Y
	Cylindropuntia acanthocarpa	57	2.7	0.0	16.0				Y
	Thamnosma montana	55	1.3	0.2	14.0				Y
	Hymenoclea salsola	51	1.4	0.2	12.0				Y
	Lycium andersonii	48	1.3	0.2	12.0				
	Salazaria mexicana	46	1.1	0.2	12.0				
	Echinocereus engelmannii	39	0.5	0.1	8.0				
	Ericameria cooperi	35	2.0	0.2	31.0				
	Gutierrezia microcephala	35	0.8	0.2	15.0				
	Larrea tridentata	29	1.2	0.2	13.0				
	Krameria erecta	28	0.8	0.2	10.0				
	Grayia spinosa	28	0.6	0.1	5.0				
	Yucca baccata	28	0.5	0.2	6.0				
	Opuntia basilaris	28	0.1	0.1	2.0				
	Salvia dorrii	25	0.5	0.2	9.0				
	Senegalia greggii	25	0.4	0.0	8.0				
	Stephanomeria pauciflora	25	0.1	0.2	2.0				
	Ericameria linearifolia	22	0.6	0.2	9.0				

	Tetradymia stenolepis	22	0.5	0.0	8.0	
	Yucca schidigera	22	0.3	0.2	3.0	
Herb						
	Eriogonum fasciculatum	74	4.0	3.0	3.0	Y
	Eriogonum fasciculatum	74	4.0	3.0	3.0	Y
	Bromus rubens	52	1.5	0.2	35.0	Y
	Achnatherum speciosum	48	0.5	0.1	5.0	
	Sphaeralcea ambigua	46	0.3	0.1	3.0	
	Xylorhiza tortifolia	29	0.2	0.1	4.0	
	Erodium cicutarium	26	0.4	0.1	8.0	
	Amsinckia	25	0.1	0.1	2.0	
Non-vascular						
	Lichen	22	0.1	0.2	2.0	

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Coleogyne ramosissima – Ericameria teretifolia Association

Common Name: Blackbush – Green Rabbitbrush Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: 1523 m
Slope: 27°
Aspect: Northeast-facing

Tree Cover: 0%
Shrub Cover: 9%
Herb Cover: 2%

Surface Covers:

Large Rock: 55%
Small Rock: 25%
Fines: 13%
Litter: 6%

Surveys Used in Description (N =1): DEVAS119

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ericameria teretifolia	100	3.0	3.0	3.0	Y		Y	Y
	Coleogyne ramosissima	100	2.0	2.0	2.0	Y			Y
	Eriogonum fasciculatum	100	1.0	1.0	1.0	Y			Y
	Ephedra viridis	100	1.0	1.0	1.0	Y			Y
	Krascheninnikovia lanata	100	1.0	1.0	1.0	Y			Y
	Grayia spinosa	100	1.0	1.0	1.0	Y			Y
	Opuntia basilaris	100	0.1	0.1	0.1	Y			Y
	Artemisia ludoviciana	100	0.1	0.1	0.1	Y			Y
	Brickellia desertorum	100	0.1	0.1	0.1	Y			Y
	Lotus rigidus	100	0.1	0.1	0.1	Y			Y
Herb									
	Bromus tectorum	100	0.5	0.5	0.5	Y			Y
	Achnatherum speciosum	100	0.5	0.5	0.5	Y			Y
	Galium	100	0.1	0.1	0.1	Y			Y
	Mentzelia	100	0.1	0.1	0.1	Y			Y
	Amsinckia	100	0.1	0.1	0.1	Y			Y
	Phacelia	100	0.1	0.1	0.1	Y			Y

Salvia columbariae	100	0.1	0.1	0.1	Y	Y
Sphaeralcea ambigua	100	0.1	0.1	0.1	Y	Y
Xylorhiza tortifolia	100	0.1	0.1	0.1	Y	Y
Camissonia claviformis	100	0.1	0.1	0.1	Y	Y
Erodium cicutarium	100	0.1	0.1	0.1	Y	Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Coleogyne ramosissima – Eriogonum fasciculatum Association

Common Name: Blackbush – California Buckwheat Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1370 m, Range 1013 – 1779 m
Slope: Mean 13°, Range 0 – 26°
Aspect: Variable

Tree Cover: Mean 1.1%, Range 0 – 3%
Shrub Cover: Mean 18.9%, Range 2 – 31%
Herb Cover: Mean 8.8%, Range 2 – 35%

Surface Covers:

Large Rock: Mean 7.5%, Range 0.4 – 25%
Small Rock: Mean 72.9%, Range 38 – 94%
Fines: Mean 11.3%, Range 2 – 38%
Litter: Mean 4.4%, Range 0 – 10%

Surveys Used in Description (N =30): CAMO9108, CAMO9132, DEVA9354, DEVAD123, MOJA0444, MOJA0454, MOJA9381, MOJA9417, MOJA9447, MOJA9674, MOJA9689, MOJC0268, MOJC1147, MOJC1149, MOJJE002, MOJJE004, MOJJE010, MOJJE018, MOJJE023, MOJJE026, MOJJE061, MOJJE082, MOJJE084, MOJJE126, MOJJE135, MOJJE156, MOJJE164, MOJJE194, MOJJE407, MOJJE444

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Coleogyne ramosissima	100	18.0	3.0	66.0	Y		Y	Y
	Eriogonum fasciculatum	97	8.3	1.0	33.0	Y			Y
	Eriogonum fasciculatum	97	8.3	1.0	33.0	Y			Y
	Cylindropuntia acanthocarpa	83	3.4	0.2	14.0	Y			Y
	Ephedra nevadensis	83	3.3	0.2	13.0	Y			Y
	Thamnosma montana	63	1.2	0.2	7.0				Y
	Salazaria mexicana	57	0.9	0.2	7.0				Y
	Echinocereus engelmannii	57	0.8	0.1	8.0				Y
	Krameria erecta	50	1.2	0.2	10.0				Y
	Hymenoclea salsola	50	1.1	0.2	11.0				Y
	Ericameria linearifolia	43	1.3	0.2	9.0				
	Gutierrezia microcephala	40	1.1	0.2	15.0				

	Yucca baccata	40	0.6	0.2	4.0		
	Larrea tridentata	37	1.6	0.2	13.0		
	Senegalia greggii	37	0.8	0.2	8.0		
	Lycium andersonii	37	0.7	0.2	6.0		
	Yucca schidigera	33	0.5	0.2	3.0		
	Salvia mohavensis	33	0.5	0.2	4.0		
	Ericameria cooperi	30	2.3	0.2	21.0		
	Prunus fasciculata	27	0.2	0.2	1.0		
	Opuntia polyacantha var. erinacea	27	0.2	0.1	2.0		
	Stephanomeria pauciflora	27	0.1	0.2	2.0		
	Menodora spinescens	23	0.9	1.0	9.0		
	Salvia dorrii	23	0.9	0.2	9.0		
	Tetradymia stenolepis	20	0.7	0.5	8.0		
	Ferocactus cylindraceus	20	0.4	0.2	6.0		
	Ericameria teretifolia	20	0.4	0.1	8.0		
	Ephedra viridis	20	0.2	0.5	2.0		
	Opuntia basilaris	20	0.2	0.2	2.0		
Herb							
	Eriogonum fasciculatum	97	8.3	3.0	3.0	Y	Y
	Eriogonum fasciculatum	97	8.3	3.0	3.0	Y	Y
	Achnatherum speciosum	50	0.5	0.2	4.0		Y
	Bromus rubens	47	2.2	0.2	35.0		
	Sphaeralcea ambigua	43	0.4	0.1	3.0		
	Erodium cicutarium	37	0.3	0.2	6.0		
	Pleuraphis rigida	27	4.5	0.2	58.0		
	Amsinckia	27	0.1	0.2	2.0		
	Xylorhiza tortifolia	23	0.3	0.2	4.0		
Non-vascular							
	Lichen	30	0.1	0.2	2.0		

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Cylindropuntia acanthocarpa / Pleuraphis rigida Shrubland Alliance

Common Name: Buckhorn cholla / big galleta grass scrub

NVC Alliance Code: A4156. *Cylindropuntia acanthocarpa / Pleuraphis rigida* Scrub Alliance

Associations	Sample Size	NVC Code
Cylindropuntia acanthocarpa var. *coloradensis*	12	CEPP006729
Pleuraphis rigida / (Acamptopappus sphaerocephalus – Ericameria cooperi)	38	CEPP006733

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 1284 m, Range 923 – 1666 m
Slope: Mean 6°, Range 1 – 26°
Aspect: Variable

Tree Cover: Mean 2.0%, Range 2 – 2%
Shrub Cover: Mean 10.6%, Range 1 – 21%
Herb Cover: Mean 16.9%, Range 3 – 55%

Surface Covers:

Large Rock: Mean 8.1%, Range 0 – 33%
Small Rock: Mean 50.4%, Range 10 – 91%
Fines: Mean 31.0%, Range 0 – 88%
Litter: Mean 3.9%, Range 0 – 10%

Conservation Status Rank: Global: GNR; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**50**	

Surveys Used in Description (N = 50): MOJA0599, MOJA9134, MOJA9502, MOJA9584, MOJA9616, MOJA9617, MOJA9627, MOJA9636, MOJAA002, MOJAA003, MOJAA013, MOJAA015, MOJAA017, MOJAA027, MOJAA028, MOJAA047, MOJAA053, MOJAA057, MOJAA058, MOJAA066, MOJAA067, MOJAA070, MOJAA071, MOJAA072, MOJAA073, MOJAA074, MOJAA075, MOJAA076, MOJC0202, MOJC0205, MOJC0210, MOJC1143, MOJC1174, MOJC1222, MOJJE000,

MOJJE086, MOJJE091, MOJJE097, MOJJE116, MOJJE247, MOJJE250, MOJJE431, MOJJE530, MOJJE534, MOJJE536, MOJJE553, MOJJE555, MOJJE557, MOJJE558, MOJJE651

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Yucca brevifolia	40	0.6	0.1	5.0				
Shrub									
	Ephedra nevadensis	86	1.7	0.1	13.0	Y			Y
	Cylindropuntia acanthocarpa	64	3.3	0.1	28.0				Y
	Hymenoclea salsola	56	1.1	0.1	10.0				Y
	Ericameria cooperi	52	2.2	0.1	19.0				Y
	Eriogonum fasciculatum	42	1.3	0.1	10.0				
	Yucca baccata	40	0.7	0.1	5.0				
	Krameria erecta	38	0.5	0.2	6.0				
	Echinocereus engelmannii	38	0.4	0.1	8.0				
	Larrea tridentata	36	1.1	0.1	20.0				
	Acamptopappus sphaerocephalus	34	2.1	0.1	32.0				
	Senegalia greggii	34	0.5	0.0	9.0				
	Salazaria mexicana	34	0.5	0.1	7.0				
	Gutierrezia	30	0.2	0.1	2.0				
	Lycium andersonii	28	1.0	0.2	12.0				
	Lycium	28	0.1	0.1	1.0				
	Ambrosia dumosa	26	1.0	0.1	17.0				
	Ferocactus cylindraceus	24	0.4	0.1	6.0				
	Yucca schidigera	24	0.2	0.1	2.0				
	Opuntia polyacantha var. erinacea	24	0.1	0.1	2.0				
	Opuntia basilaris	22	0.1	0.1	1.0				
	Gutierrezia microcephala	20	0.5	0.2	8.0				
Herb									
	Pleuraphis rigida	88	26.5	0.1	89.0	Y	Y		Y
	Muhlenbergia porteri	46	1.4	0.1	39.0				
	Sphaeralcea ambigua	42	0.4	0.1	8.0				
	Bouteloua eriopoda	30	2.1	0.1	25.0				
	Achnatherum speciosum	28	0.1	0.1	3.0				
	Erodium cicutarium	26	1.4	0.2	20.0				
	Bromus rubens	22	0.9	0.2	20.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Cylindropuntia bigelovii Shrubland Alliance

Common Name: Teddy bear cholla patches

NVC Alliance Code: A3146. *Cylindropuntia bigelovii* Cacti Scrub Alliance

Associations	Sample Size	NVC Code
Cylindropuntia bigelovii	1	CEGL003065

Classification Comments: The association circumscription is the same as that of the alliance.

Plot/Sample Data Summary:

Elevation: 736 m
Slope: 9°
Aspect: Southwest-facing

Tree Cover: 0%
Shrub Cover: 20%
Herb Cover: 5%

Surface Covers:

Large Rock: 16%
Small Rock: 70%
Fines: 5%
Litter: 8%

Conservation Status Rank: Global: G4; **State (California):** S3

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**1**	

Surveys Used in Description (N = 1): SLTN1082

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Cylindropuntia bigelovii	100	14.0	14.0	14.0	Y	Y		Y
	Ambrosia dumosa	100	3.0	3.0	3.0	Y			Y
	Larrea tridentata	100	2.0	2.0	2.0	Y			Y
	Echinocactus polycephalus	100	0.1	0.1	0.1	Y			Y

	Opuntia basilaris	100	0.1	0.1	0.1	Y			Y
	Psorothamnus	100	0.1	0.1	0.1	Y			Y
Herb									
	Plantago ovata	100	3.0	3.0	3.0	Y	Y		Y
	Chorizanthe rigida	100	2.0	2.0	2.0	Y		Y	Y
	Eriogonum inflatum	100	0.1	0.1	0.1	Y			Y
	Camissonia boothii	100	0.1	0.1	0.1	Y			Y
	Chaenactis	100	0.1	0.1	0.1	Y			Y
	Cryptantha	100	0.1	0.1	0.1	Y			Y
	Dalea mollissima	100	0.1	0.1	0.1	Y			Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Encelia (actonii, virginensis) – Viguiera reticulata Shrubland Alliance

Common Name: Acton's and Virgin River brittle brush – net-veined goldeneye scrub

NVC Alliance Code: A4163. *Encelia actonii - Encelia virginensis - Viguiera reticulata* Desert Scrub Alliance

Associations	Sample Size	NVC Code
Encelia actonii	2	CEGL005748
Encelia virginensis	1	CEGL001335
Viguiera reticulata	5	CEGL002962

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 1117 m, Range 889 – 1608 m
Slope: Mean 16°, Range 2 – 42°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 16.6%, Range 7 – 40%
Herb Cover: Mean 6.4%, Range 0 – 21%

Surface Covers:

Large Rock: Mean 24.9%, Range 5 – 65%
Small Rock: Mean 65.6%, Range 27 – 93%
Fines: Mean 2.6%, Range 1 – 10%
Litter: Mean 6.6%, Range 0 – 31%

Conservation Status Rank: Global: G3; **State (California):** S3

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**2**	**6**

Surveys Used in Description (N = 8): DEVA9175, DEVA9188, DEVA9416, DEVA9532, DEVAS175, MOJC1045, SLTN0626, SLTN0777

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									

	Viguiera reticulata	88	2.4	0.1	5.0	Y		Y
	Larrea tridentata	75	0.9	0.2	3.0	Y		Y
	Gutierrezia microcephala	75	0.8	0.2	3.0	Y		Y
	Eriogonum fasciculatum	63	1.5	0.2	5.0			Y
	Ambrosia dumosa	50	0.1	0.1	0.2			Y
	Lycium andersonii	38	0.7	0.5	3.0			
	Hymenoclea salsola	38	0.4	0.2	2.5			
	Bebbia juncea	38	0.1	0.2	0.5			
	Stephanomeria pauciflora	38	0.1	0.1	0.5			
	Echinocactus polycephalus	38	0.1	0.2	0.2			
	Echinocereus engelmannii	38	0.1	0.1	0.2			
	Encelia actonii	25	2.8	2.0	20.0			
	Encelia virginensis	25	0.7	0.2	5.0			
	Salazaria mexicana	25	0.6	1.0	4.0			
	Brickellia longifolia	25	0.6	2.0	3.0			
	Prunus fasciculata	25	0.5	0.2	4.0			
	Krameria erecta	25	0.5	1.0	3.0			
	Encelia farinosa	25	0.4	0.2	3.0			
	Amphipappus fremontii	25	0.4	0.1	3.0			
	Ephedra nevadensis	25	0.3	0.5	2.0			
	Peucephyllum schottii	25	0.1	0.2	0.2			
Herb								
	Bromus rubens	88	4.7	0.1	20.0	Y	Y	Y
	Erodium cicutarium	63	0.2	0.1	1.0			Y
	Amsinckia	63	0.1	0.1	0.2			Y
	Eriogonum inflatum	50	0.1	0.1	0.5			Y
	Sphaeralcea ambigua	50	0.1	0.1	0.5			Y
	Phacelia	50	0.1	0.1	0.2			Y
	Eriogonum	38	0.1	0.1	0.5			
	Achnatherum speciosum	25	0.1	0.1	1.0			
	Bromus tectorum	25	0.1	0.5	0.5			
	Lotus	25	0.1	0.2	0.2			
	Chorizanthe brevicornu	25	0.1	0.2	0.2			
	Salvia columbariae	25	0.1	0.2	0.2			
	Cheilanthes parryi	25	0.1	0.2	0.2			
	Forb (herbaceous, not grass nor grasslike)	25	0.0	0.1	0.2			
	Pterostegia drymarioides	25	0.0	0.1	0.2			

Plantago ovata	25	0.0	0.1	0.2
Delphinium parishii	25	0.0	0.1	0.1

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Encelia actonii Association

Common Name: Acton's brittle brush scrub Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1087 m, Range 1030 – 1143 m
Slope: Mean 14°, Range 11 – 17°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 25.5%, Range 11 – 40%
Herb Cover: Mean 10.6%, Range 0 – 21%

Surface Covers:

Large Rock: Mean 47.5%, Range 30 – 65%
Small Rock: Mean 44.0%, Range 33 – 55%
Fines: Mean 1.5%, Range 1 – 2%
Litter: Mean 5.5%, Range 1 – 10%

Surveys Used in Description (N =2): SLTN0626, SLTN0777

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Encelia actonii	100	11.0	2.0	20.0	Y			Y
	Larrea tridentata	100	2.5	2.0	3.0	Y			Y
	Gutierrezia microcephala	100	2.0	1.0	3.0	Y			Y
	Amphipappus fremontii	100	1.6	0.1	3.0	Y			Y
	Viguiera reticulata	100	0.6	0.1	1.0	Y			Y
	Ericameria linearifolia	50	2.5	5.0	5.0				Y
	Ephedra funerea	50	2.0	4.0	4.0				Y
	Prunus fasciculata	50	2.0	4.0	4.0				Y
	Salazaria mexicana	50	2.0	4.0	4.0				Y
	Eriogonum fasciculatum	50	1.5	3.0	3.0				Y
	Krameria erecta	50	1.5	3.0	3.0				Y
	Brickellia longifolia	50	1.5	3.0	3.0				Y
	Salvia dorrii	50	1.5	3.0	3.0				Y
	Ericameria teretifolia	50	0.1	0.1	0.1				Y
	Psorothamnus arborescens	50	0.1	0.1	0.1				Y
	Eucnide urens	50	0.1	0.1	0.1				Y
	Ambrosia dumosa	50	0.1	0.1	0.1				Y

	Stephanomeria pauciflora	50	0.1	0.1	0.1			Y
Herb								
	Bromus rubens	100	10.1	0.1	20.0	Y	Y	Y
	Cryptantha racemosa	50	0.1	0.2	0.2			Y
	Forb (herbaceous, not grass nor grasslike)	50	0.1	0.1	0.1			Y
	Sphaeralcea ambigua	50	0.1	0.1	0.1			Y
	Delphinium parishii	50	0.1	0.1	0.1			Y
	Phacelia	50	0.1	0.1	0.1			Y
	Plantago ovata	50	0.1	0.1	0.1			Y
	Cryptantha	50	0.1	0.1	0.1			Y
	Amsinckia	50	0.1	0.1	0.1			Y
	Eriogonum	50	0.1	0.1	0.1			Y
	Eriogonum inflatum	50	0.1	0.1	0.1			Y
	Erodium cicutarium	50	0.1	0.1	0.1			Y
	Galium stellatum	50	0.1	0.1	0.1			Y
	Poaceae	50	0.1	0.1	0.1			Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Encelia farinosa Shrubland Alliance

Common Name: Brittle bush scrub

NVC Alliance Code: A4215. *Encelia farinosa* Desert Scrub Alliance

Associations	Sample Size	NVC Code
Encelia farinosa	12	CEGL001251
Encelia farinosa – Ambrosia dumosa	6	CEGL005061
Encelia farinosa – Peucephyllum schottii	4	CEGL005749

Classification Comments: None.

Plot/Sample Data Summary:
Elevation: Mean 650 m, Range 303 – 1038 m
Slope: Mean 24°, Range 4 – 37°
Aspect: Mostly south-facing

Tree Cover: 0%
Shrub Cover: Mean 12.4%, Range 1 – 40%
Herb Cover: Mean 5.6%, Range 0 – 15%

Surface Covers:
Large Rock: Mean 39.6%, Range 10 – 78%
Small Rock: Mean 45.2%, Range 10 – 75%
Fines: Mean 4.4%, Range 1 – 20%
Litter: Mean 2.4%, Range 0 – 12%

Conservation Status Rank: Global: G5; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**1**	**6**	**11**	**4**

Surveys Used in Description (N = 22): DEVA9433, DEVAD043, DEVAS164, DEVAS174, MOJA0923, MOJA9551, MOJC0316, MOJC0399, MOJC0489, MOJC0576, MOJC0577, MOJC0888, MOJC0894, MOJC0908, MOJC0909, MOJC0927, MOJC1114, MOJC1194, MOJD0101, MOJDR117, MOJJE594, SLTN0726

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Encelia farinosa	100	10.2	1.0	39.0	Y	Y		Y
	Larrea tridentata	91	1.6	0.1	16.0	Y			Y
	Ambrosia dumosa	64	2.0	0.1	23.0				Y
	Echinocactus polycephalus	36	0.2	0.1	2.0				
	Opuntia basilaris	27	0.1	0.1	0.5				
	Stephanomeria pauciflora	23	0.1	0.1	1.0				
Herb									
	Eriogonum inflatum	50	0.2	0.1	0.5				Y
	Schismus	41	0.3	0.1	4.0				
	Cryptantha	32	0.2	0.1	2.0				
	Perityle emoryi	27	0.2	0.1	2.0				
	Chorizanthe brevicornu	23	0.1	0.1	1.0				
Non-vascular									
	Cryptogammic crust	23	0.2	0.2	2.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Encelia farinosa Association

Common Name: Brittlebush succulent scrub Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 564 m, Range 315 – 889 m
Slope: Mean 23°, Range 4 – 37°
Aspect: Mostly south-facing

Tree Cover: 0%
Shrub Cover: Mean 11.8%, Range 2 – 40%
Herb Cover: Mean 6.3%, Range 0 – 15%

Surface Covers:

Large Rock: Mean 35.3%, Range 10 – 68%
Small Rock: Mean 50.3%, Range 29 – 68%
Fines: Mean 3.6%, Range 1 – 10%
Litter: Mean 3.7%, Range 0 – 12%

Surveys Used in Description (N =12): DEVAS164, DEVAS174, MOJA0923, MOJA9551, MOJC0577, MOJC0888, MOJC0908, MOJC0909, MOJC1194, MOJD0101, MOJDR117, SLTN0726

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Encelia farinosa	100	12.6	6.0	39.0	Y	Y		Y
	Larrea tridentata	83	1.1	0.2	2.5	Y			Y
	Ambrosia dumosa	50	0.4	0.2	3.0				Y
	Opuntia basilaris	42	0.1	0.1	0.5				
	Fagonia laevis	25	0.3	0.5	2.0				
Herb									
	Schismus	50	0.4	0.1	4.0				Y
	Cryptantha	42	0.3	0.1	2.0				
	Eriogonum inflatum	42	0.1	0.2	0.5				
	Perityle emoryi	33	0.4	0.1	2.0				
	Chorizanthe brevicornu	33	0.1	0.1	1.0				
	Phacelia crenulata	33	0.1	0.1	0.2				
Non-vascular									
	Cryptogammic crust	33	0.4	0.5	2.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Encelia farinosa – Ambrosia dumosa Association

Common Name: Brittlebush – White Bursage Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 761 m, Range 303 – 1038 m
Slope: Mean 25°, Range 14 – 36°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 6.7%, Range 1 – 12%
Herb Cover: Mean 4.4%, Range 1 – 9%

Surface Covers:

Large Rock: Mean 39.9%, Range 22 – 68%
Small Rock: Mean 34.0%, Range 10 – 75%
Fines: Mean 5.9%, Range 2 – 20%
Litter: Mean 0.4%, Range 0 – 1%

Surveys Used in Description (N =6): DEVA9433, MOJC0316, MOJC0399, MOJC0894, MOJC1114, MOJJE594

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Encelia farinosa	**100**	**6.6**	**1.0**	**22.0**	**X**		**X**	**X**
	Ambrosia dumosa	**100**	**6.3**	**1.0**	**23.0**	**X**		**X**	**X**
	Larrea tridentata	100	3.3	0.2	16.0	X			X
	Echinocactus polycephalus	50	0.5	0.5	2.0				X
	Viguiera parishii	33	1.3	0.5	7.0				
	Pleurocoronis pluriseta	33	0.5	1.5	1.5				
	Stephanomeria pauciflora	33	0.2	0.5	0.5				
Herb									
	Eriogonum inflatum	50	0.2	0.2	0.5				X
	Achnatherum speciosum	33	0.4	0.5	2.0				
	Pleuraphis rigida	33	0.2	0.5	0.5				
	Phacelia	33	0.1	0.2	0.5				
	Cryptantha	33	0.1	0.2	0.5				
	Schismus	33	0.1	0.2	0.5				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Encelia farinosa – Ambrosia dumosa Association

Ephedra californica – Ephedra trifurca Shrubland Alliance

Common Name: California joint fir – longleaf joint-fir scrub

NVC Alliance Code: A2536. *Ephedra californica - Ephedra trifurca* Desert Wash Scrub Alliance

Associations	Sample Size	NVC Code
Ephedra californica – Ambrosia salsola	33	CEGL002958

Classification Comments: The association circumscription is the same as that of the alliance.

Plot/Sample Data Summary:

Elevation: Mean 956 m, Range 767 – 1138 m
Slope: Mean 3°, Range 2 – 4°
Aspect: Variable

Tree Cover: Mean 1.0%, Range 1 – 1%
Shrub Cover: Mean 12.9%, Range 5 – 23%
Herb Cover: Mean 1.0%, Range 0 – 15%

Surface Covers:

Large Rock: Mean 5.9%, Range 0 – 16%
Small Rock: Mean 88.7%, Range 13 – 99%
Fines: Mean 35.8%, Range 10 – 70%
Litter: Mean 1.4%, Range 0 – 10%

Conservation Status Rank: Global: G5; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size		**4**	**29**	

Surveys Used in Description (N = 33): MOJAE017, MOJAE019, MOJAE020, MOJAE022, MOJAE023, MOJAE024, MOJAE025, MOJAE026, MOJAE027, MOJAE028, MOJAE029, MOJAE030, MOJAE031, MOJAE032, MOJAE033, MOJAE034, MOJAE035, MOJAE208, MOJAE210, MOJAE211, MOJAE215, MOJAE220, MOJAE221, MOJAE222, MOJAE227, MOJAE228, MOJAE229, MOJAE230, MOJC0747, MOJC1239, MOJJE057, MOJJE060, MOJJE074

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ephedra californica	100	9.1	2.0	51.0	Y		Y	Y
	Hymenoclea salsola	100	7.1	1.0	48.0	Y			Y
	Cleome isomeris	85	0.7	0.2	3.0	Y			Y
	Larrea tridentata	82	2.0	0.2	11.0	Y			Y
	Ambrosia dumosa	73	1.0	0.2	20.0				Y
	Lycium andersonii	45	0.2	0.2	1.1				
	Senegalia greggii	45	0.2	0.2	1.1				
	Cylindropuntia ramosissima	42	0.1	0.2	2.0				
	Senecio flaccidus	33	0.3	0.2	2.0				
	Psorothamnus arborescens	30	0.2	0.2	1.6				
	Senna armata	27	0.3	0.2	3.6				
	Salazaria mexicana	27	0.1	0.2	1.0				
	Stephanomeria pauciflora	27	0.1	0.2	0.2				
	Krameria grayi	21	0.0	0.2	0.2				
Herb									
	Schismus	88	1.3	0.2	8.0	Y		Y	Y
	Erodium cicutarium	88	0.5	0.2	2.0	Y			Y
	Bromus rubens	79	0.4	0.2	3.0	Y			Y
	Adenophyllum cooperi	67	0.2	0.2	1.0				Y
	Stillingia linearifolia	21	0.0	0.2	0.2				
	Sphaeralcea ambigua	21	0.0	0.2	0.2				
Non-vascular									
	Cryptogammic crust	52	0.3	0.2	5.0				Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Ephedra funerea Shrubland Alliance

Common Name: Death Valley joint fir scrub

NVC Alliance Code: A4157. *Ephedra funerea* Scrub Alliance

Associations	Sample Size	NVC Code
Ephedra funerea	7	CEGL005750

Classification Comments: The association circumscription is the same as that of the alliance.

Plot/Sample Data Summary:

Elevation: Mean 1082 m, Range 653 – 1292 m
Slope: Mean 16°, Range 4 – 31°
Aspect: Mostly south-facing

Tree Cover: 0%
Shrub Cover: Mean 5.9%, Range 1 – 10%
Herb Cover: Mean 2.8%, Range 0 – 5%

Surface Covers:

Large Rock: Mean 21.2%, Range 0.4 – 40%
Small Rock: Mean 57.1%, Range 40 – 95%
Fines: Mean 25.2%, Range 2 – 63%
Litter: Mean 1.1%, Range 0 – 5%

Conservation Status Rank: Global: G3; **State (California):** S3

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**4**	**3**

Surveys Used in Description (N = 7): DEVAD041, DEVAS152, DEVAS154, MOJC0302, MOJC0922, MOJC0923, MOJC0924

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ephedra funerea	100	1.7	0.3	3.5	Y			Y
	Ambrosia dumosa	100	1.0	0.3	2.0	Y			Y
	Krameria erecta	86	0.7	0.1	2.0	Y			Y

	Larrea tridentata	57	0.6	0.1	2.5			Y
	Eriogonum fasciculatum	57	0.2	0.1	0.5			Y
	Atriplex confertifolia	43	0.4	0.5	1.0			
	Gutierrezia microcephala	43	0.2	0.1	0.5			
	Amphipappus fremontii	43	0.1	0.1	0.5			
	Encelia virginensis	29	0.5	0.5	3.0			
	Salazaria mexicana	29	0.2	0.5	1.0			
	Stephanomeria pauciflora	29	0.1	0.1	0.5			
	Galium stellatum	29	0.1	0.1	0.5			
	Encelia farinosa	29	0.1	0.1	0.5	N		
Herb								
	Eriogonum inflatum	100	0.4	0.1	0.5	Y		Y
	Erodium cicutarium	71	0.3	0.1	0.5			Y
	Achnatherum speciosum	57	0.3	0.5	0.5			Y
	Bromus rubens	57	0.3	0.5	0.5			Y
	Xylorhiza tortifolia	57	0.2	0.1	0.5			Y
	Mirabilis laevis	29	0.1	0.5	0.5			
	Sphaeralcea ambigua	29	0.1	0.5	0.5			
	Chaenactis carphoclinia	29	0.1	0.1	0.5			
	Plantago ovata	29	0.1	0.1	0.3			

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Ephedra nevadensis – Lycium andersonii – Grayia spinosa Shrubland Alliance

Common Name: Nevada joint fir – Anderson's boxthorn – spiny hop sage scrub

NVC Alliance Code: A4245. *Ephedra nevadensis - Lycium andersonii - Grayia spinosa* Scrub Alliance

Associations	Sample Size	NVC Code
Ephedra nevadensis – (Salazaria mexicana – Ambrosia salsola)	6	CEGL005751
Ephedra nevadensis – Ericameria cooperi	14	CEGL001253
Ephedra nevadensis – Lycium andersonii	6	CEGL005752
Ephedra nevadensis – Lycium andersonii – Grayia spinosa (alliance)	1	A4245
Ericameria cooperi	1	
Grayia spinosa – Larrea tridentata	8	CEGL001271
Grayia spinosa – Lycium andersonii	12	CEGL001347
Grayia spinosa – Lycium pallidum	3	CEGL001348
Grayia spinosa – Picrothamnus desertorum	2	CEGL001345
Lycium andersonii	8	CEGL006857

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 1332 m, Range 795 – 1789 m
Slope: Mean 7°, Range 0 – 33°
Aspect: Variable

Tree Cover: Mean 0.7%, Range 0 – 2%
Shrub Cover: Mean 14.9%, Range 2 – 30%
Herb Cover: Mean 9.2%, Range 0 – 80%

Surface Covers:

Large Rock: Mean 8.9%, Range 0 – 50%
Small Rock: Mean 58.8%, Range 0 – 100%
Fines: Mean 24.9%, Range 0 – 88%
Litter: Mean 3.0%, Range 0 – 25%

Conservation Status Rank: Global: G5; **State (California):** S3S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**40**	**24**

Surveys Used in Description (N = 64): CAMO9129, DEVA0353, DEVA9277, DEVA9352, DEVAS039, DEVAS149, DEVAS150, MOJA0104, MOJA0595, MOJA0596, MOJA0921, MOJA9809, MOJAA046, MOJC0133, MOJC0134, MOJC0136, MOJC0137, MOJC0256, MOJC0471, MOJC0488, MOJC0497, MOJC0594, MOJC0596, MOJC0597, MOJC0825, MOJC0841, MOJC0843, MOJC0933, MOJC0958, MOJC0978, MOJC0983, MOJC0984, MOJC0985, MOJC0987, MOJC0988, MOJC1004, MOJC1020, MOJC1021, MOJC1022, MOJC1103, MOJC1118, MOJC1127, MOJJE012, MOJJE020, MOJJE062, MOJJE078, MOJJE089, MOJJE100, MOJJE101, MOJJE155, MOJJE163, MOJJE193, MOJJE209, MOJJE240, MOJJE531, MOJJE535, MOJJE538, MOJJE552, MOJJE556, MOJJE559, SLTN0715, SLTN0735, SLTN0736, SLTN0965

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Yucca brevifolia	28	0.3	0.1	4.0				
Shrub									
	Ephedra nevadensis	69	3.5	0.1	25.0				Y
	Lycium andersonii	66	3.3	0.2	28.0				Y
	Grayia spinosa	61	3.2	0.2	24.0				Y
	Ericameria cooperi	55	2.7	0.1	23.0				Y
	Hymenoclea salsola	45	1.9	0.1	15.0				
	Larrea tridentata	42	2.0	0.0	23.0				
	Krascheninnikovia lanata	42	1.1	0.1	18.0				
	Eriogonum fasciculatum	42	0.9	0.1	8.0				
	Ambrosia dumosa	31	0.7	0.2	10.0				
	Cylindropuntia acanthocarpa	27	1.2	0.2	18.0				
	Krameria erecta	27	0.9	0.2	11.0				
	Thamnosma montana	27	0.7	0.2	14.0				
	Acamptopappus sphaerocephalus	23	1.1	0.1	16.0				
	Salazaria mexicana	23	0.8	0.1	15.0				
	Coleogyne ramosissima	22	0.5	0.0	9.0				

	Lycium cooperi	20	0.7	0.1	18.0		
Herb							
	Bromus rubens	52	1.7	0.1	25.0		Y
	Sphaeralcea ambigua	36	0.6	0.1	25.0		
	Achnatherum speciosum	31	0.4	0.1	4.0		
	Xylorhiza tortifolia	28	0.2	0.1	2.0		
	Pleuraphis rigida	27	5.3	0.2	54.0		
	Eriogonum inflatum	23	0.1	0.1	1.0		

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Grayia spinosa – Lycium andersonii Association

Common Name: Hop-sage - Anderson's Wolfberry Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1463 m, Range 1118 – 1789 m
Slope: Mean 10°, Range 0 – 33°
Aspect: Variable

Tree Cover: Mean 0.7%, Range 0 – 1%
Shrub Cover: Mean 18.6%, Range 9 – 30%
Herb Cover: Mean 18.3%, Range 0 – 80%

Surface Covers:

Large Rock: Mean 13.2%, Range 0 – 40%
Small Rock: Mean 68.4%, Range 10 – 100%
Fines: Mean 11.9%, Range 0 – 63%
Litter: Mean 3.4%, Range 0 – 10%

Surveys Used in Description (N =12): DEVA9277, MOJA0921, MOJC0256, MOJC0471, MOJC0596, MOJC0597, MOJC0843, MOJC0978, MOJC0985, MOJC1004, MOJJE538, SLTN0735

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Yucca brevifolia	42	0.3	0.1	1.5				
Shrub									
	Grayia spinosa	100	8.3	3.0	24.0	Y		Y	Y
	Lycium andersonii	92	3.3	0.5	19.0	Y			Y
	Ephedra nevadensis	83	1.8	0.1	4.0	Y			Y
	Krascheninnikovia lanata	67	1.8	0.2	8.0				Y
	Hymenoclea salsola	67	1.0	0.2	7.0				Y
	Ericameria cooperi	42	0.8	0.2	5.0				
	Eriogonum fasciculatum	33	0.5	0.2	4.0				
	Tetradymia axillaris	33	0.2	0.2	1.0				
	Thamnosma montana	33	0.1	0.2	0.5				
	Opuntia basilaris	33	0.1	0.2	0.5				
	Larrea tridentata	25	1.0	0.5	11.0				
	Acamptopappus shockleyi	25	0.5	0.5	4.0				
	Coleogyne ramosissima	25	0.4	0.2	3.0				
	Tetradymia stenolepis	25	0.1	0.2	0.5				
Herb									

Bromus rubens	58	3.2	0.5	25.0	Y
Sphaeralcea ambigua	58	0.4	0.2	2.0	Y
Achnatherum speciosum	50	0.8	0.2	4.0	Y
Xylorhiza tortifolia	50	0.3	0.2	2.0	Y
Eriogonum inflatum	42	0.3	0.2	1.0	
Astragalus	33	0.2	0.2	1.0	
Plant	25	0.4	1.0	2.0	
Amsinckia	25	0.4	0.2	4.0	
Achnatherum hymenoides	25	0.1	0.1	0.5	

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Ericameria paniculata Shrubland Alliance

Common Name: Black-stem rabbitbrush scrub

NVC Alliance Code: A2509. *Ericameria paniculata* Mojave Desert Wash Scrub Alliance

Associations	Sample Size	NVC Code
Ericameria paniculata	19	CEGL002706
Ericameria paniculata – Ambrosia salsola	13	CEPP006864

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 1011 m, Range 399 – 1445 m
Slope: Mean 3°, Range 0 – 23°
Aspect: Variable

Tree Cover: Mean 2.1%, Range 0 – 4%
Shrub Cover: Mean 14.6%, Range 3 – 64%
Herb Cover: Mean 2.3%, Range 0 – 5%

Surface Covers:

Large Rock: Mean 4.5%, Range 0 – 27%
Small Rock: Mean 48.8%, Range 3 – 97%
Fines: Mean 46.9%, Range 3 – 96%
Litter: Mean 3.2%, Range 0 – 16%

Conservation Status Rank: Global: G4; **State (California):** S3

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**29**	**3**

Surveys Used in Description (N = 32): CAMO9102, DEVA9190, DEVA9266, DEVAD038, DEVAD073, DEVAS038, MOJA9317, MOJA9372, MOJA9382, MOJA9402, MOJA9501, MOJA9630, MOJA9631, MOJA9639, MOJA9670, MOJA9677, MOJAE091, MOJAE094, MOJAE095, MOJAE223, MOJC0003, MOJC0012, MOJC0204, MOJC0251, MOJC0344, MOJC0738, MOJC0749, MOJJE188, MOJJE267, MOJJE274, MOJJE498, SLTN0851

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ericameria paniculata	97	11.6	2.5	50.0	Y		Y	Y
	Hymenoclea salsola	84	3.9	0.1	27.0	Y			Y
	Larrea tridentata	50	2.3	0.2	35.0				Y
	Ambrosia eriocentra	44	1.2	0.2	16.0				
	Ambrosia dumosa	41	0.6	0.1	10.0				
	Eriogonum fasciculatum	38	0.4	0.2	5.0				
	Senegalia greggii	34	0.9	0.2	18.0				
	Salvia dorrii	34	0.2	0.2	3.0				
	Brickellia incana	31	1.3	0.2	33.0				
	Stephanomeria pauciflora	31	0.2	0.1	1.1				
	Gutierrezia sarothrae	25	0.1	0.2	2.0				
	Encelia virginensis	22	0.1	0.2	1.1				
Herb									
	Bromus rubens	56	0.4	0.1	3.0				Y
	Erodium cicutarium	53	0.2	0.2	2.0				Y
	Schismus	47	0.4	0.2	3.0				
	Amsinckia	38	0.1	0.1	2.0				
	Salvia columbariae	25	0.1	0.2	0.2				
	Sphaeralcea ambigua	22	0.1	0.1	0.5				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Ericameria paniculata Association

Common Name: Black-stem Rabbitbrush Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1048 m, Range 399 – 1445 m
Slope: Mean 3°, Range 1 – 23°
Aspect: Variable

Tree Cover: Mean 1.1%, Range 0 – 2%
Shrub Cover: Mean 15.4%, Range 3 – 64%
Herb Cover: Mean 2.1%, Range 0 – 4%

Surface Covers:

Large Rock: Mean 5.0%, Range 0 – 27%
Small Rock: Mean 46.5%, Range 3 – 94%
Fines: Mean 48.1%, Range 3 – 96%
Litter: Mean 3.0%, Range 0 – 16%

Surveys Used in Description (N =19): CAMO9102, DEVA9266, DEVAD038, DEVAD073, MOJA9372, MOJA9382, MOJA9402, MOJA9631, MOJA9670, MOJA9677, MOJAE091, MOJAE094, MOJAE095, MOJC0003, MOJC0012, MOJC0204, MOJC0251, MOJC0344, MOJJE267

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ericameria paniculata	95	11.4	2.5	50.0	Y	Y		Y
	Hymenoclea salsola	74	0.9	0.1	8.0				Y
	Larrea tridentata	58	2.3	0.2	35.0				Y
	Ambrosia eriocentra	47	1.0	0.2	7.0				
	Salvia dorrii	42	0.2	0.2	1.0				
	Ambrosia dumosa	37	0.3	0.2	3.0				
	Gutierrezia sarothrae	37	0.2	0.2	2.0				
	Eriogonum fasciculatum	37	0.2	0.2	1.1				
	Brickellia incana	32	0.3	0.2	4.0				
	Senegalia greggii	32	0.2	0.2	2.0				
	Stephanomeria pauciflora	32	0.2	0.2	1.1				
	Encelia virginensis	32	0.1	0.2	1.1				
	Viguiera parishii	21	0.1	0.2	1.1				
	Phoradendron californicum	21	0.1	0.1	0.5				
Herb									

Bromus rubens	63	0.6	0.2	3.0	Y
Erodium cicutarium	58	0.3	0.2	2.0	Y
Schismus	53	0.4	0.2	2.0	Y
Amsinckia	32	0.1	0.2	0.2	
Sphaeralcea ambigua	26	0.1	0.2	0.5	
Penstemon palmeri	26	0.1	0.2	0.5	
Salvia columbariae	26	0.1	0.2	0.2	
Cryptantha	21	0.1	0.2	0.4	
Bromus tectorum	21	0.0	0.2	0.2	

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Ericameria paniculata – Ambrosia salsola Association

Common Name: Black-stem Rabbitbrush – White Bursage Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 957 m, Range 475 – 1335 m
Slope: Mean 3°, Range 0 – 16°
Aspect: Variable

Tree Cover: Mean 3.0%, Range 2 – 4%
Shrub Cover: Mean 13.3%, Range 5 – 20%
Herb Cover: Mean 2.6%, Range 0 – 5%

Surface Covers:

Large Rock: Mean 3.6%, Range 0 – 25%
Small Rock: Mean 52.3%, Range 5 – 97%
Fines: Mean 45.0%, Range 7 – 92%
Litter: Mean 3.7%, Range 0 – 8%

Surveys Used in Description (N =13): DEVA9190, DEVAS038, MOJA9317, MOJA9501, MOJA9630, MOJA9639, MOJAE223, MOJC0738, MOJC0749, MOJJE188, MOJJE274, MOJJE498, SLTN0851

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ericameria paniculata	100	12.0	3.0	44.0	Y		Y	Y
	Hymenoclea salsola	100	8.3	1.5	27.0	Y			Y
	Ambrosia dumosa	46	1.0	0.1	10.0				
	Larrea tridentata	38	2.5	0.2	16.0				
	Senegalia greggii	38	2.0	0.2	18.0				
	Ambrosia eriocentra	38	1.6	0.5	16.0				
	Eriogonum fasciculatum	38	0.8	0.2	5.0				
	Brickellia incana	31	2.7	0.2	33.0				
	Stephanomeria pauciflora	31	0.1	0.1	1.0				
	Salvia dorrii	23	0.3	0.2	3.0				
	Lycium andersonii	23	0.1	0.1	1.0				
	Cylindropuntia acanthocarpa	23	0.0	0.2	0.2				
Herb									
	Bromus rubens	46	0.3	0.1	2.0				
	Amsinckia	46	0.2	0.1	2.0				
	Erodium cicutarium	46	0.2	0.2	1.0				

Schismus	38	0.5	0.2	3.0
Chaenactis	31	0.1	0.1	0.5
Achnatherum speciosum	23	0.1	0.2	1.0
Salvia columbariae	23	0.0	0.2	0.2
Eriogonum	23	0.0	0.2	0.2
Eriogonum inflatum	23	0.0	0.1	0.2

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Eriogonum fasciculatum – Viguiera parishii Shrubland Alliance

Common Name: California buckwheat – Parish's goldeneye scrub

NVC Alliance Code: A3150. *Eriogonum fasciculatum - Viguiera parishii* Desert Scrub Alliance

Classification Comments: None.

Associations	Sample Size	NVC Code
Eriogonum fasciculatum – Ambrosia dumosa	3	n/a
Eriogonum fasciculatum – Ericameria (laricifolia, linearifolia)	21	CEPP006705
Eriogonum fasciculatum (wash)	3	CEPP006706
Eriogonum fasciculatum rock outcrop	12	CEGL001260
Viguiera parishii	14	CEGL002721
Viguiera parishii – Eriogonum fasciculatum	15	CEGL005775

Plot/Sample Data Summary:

Elevation: Mean 1246 m, Range 836 – 1810 m
Slope: Mean 17°, Range 0 – 39°
Aspect: Variable

Tree Cover: Mean 0.5%, Range 0 – 1%
Shrub Cover: Mean 11.9%, Range 1 – 40%
Herb Cover: Mean 8.5%, Range 1 – 40%

Surface Covers:

Large Rock: Mean 25.6%, Range 0 – 85%
Small Rock: Mean 49.6%, Range 0 – 98%
Fines: Mean 10.8%, Range 0 – 72%
Litter: Mean 2.6%, Range 0 – 19%

Conservation Status Rank: Global: G4; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**1**		**61**	**6**

Surveys Used in Description (N = 68): DEVA9268, DEVA9296, DEVA9363, DEVAS042, MOJA0571, MOJA0696, MOJA9290, MOJA9319, MOJA9320, MOJA9380, MOJA9391, MOJA9404, MOJA9427, MOJA9451, MOJA9535, MOJA9675, MOJA9688, MOJA9902, MOJA9913, MOJAE081, MOJAE084, MOJAE085, MOJAE086, MOJAE087, MOJAE088, MOJAE093, MOJAE205, MOJAN002, MOJC0095, MOJC0190, MOJC0206, MOJC0208, MOJC0214, MOJC0215, MOJC0252, MOJC0267, MOJC0273, MOJC0405, MOJC0461, MOJC0634, MOJC0826, MOJC0977, MOJC0989, MOJC1175, MOJC1221, MOJJE030, MOJJE042, MOJJE048, MOJJE056, MOJJE096, MOJJE106, MOJJE109, MOJJE113, MOJJE117, MOJJE120, MOJJE140, MOJJE141, MOJJE176, MOJJE249, MOJJE302, MOJJE414, MOJJE423, MOJJE533, MOJJE568, MOJJE599, MOJJE603, SLTN0737, SLTN0852

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Eriogonum fasciculatum	99	9.3	0.2	43.0	Y			Y
	Ephedra nevadensis	63	2.1	0.2	19.0				Y
	Viguiera parishii	54	2.6	0.2	20.0				Y
	Cylindropuntia acanthocarpa	54	1.9	0.1	18.0				Y
	Larrea tridentata	49	1.5	0.2	17.0				
	Senegalia greggii	46	0.7	0.2	4.6				
	Echinocereus engelmannii	44	1.2	0.2	15.0				
	Ferocactus cylindraceus	43	0.8	0.2	10.0				
	Ambrosia dumosa	41	3.1	0.2	49.0				
	Krameria erecta	41	1.2	0.2	21.0				
	Ephedra viridis	40	0.8	0.2	10.0				
	Thamnosma montana	40	0.7	0.2	12.0				
	Salazaria mexicana	40	0.6	0.1	8.0				
	Stephanomeria pauciflora	38	0.2	0.2	2.0				
	Yucca schidigera	37	0.3	0.1	3.0				
	Lycium andersonii	32	0.5	0.2	8.0				
	Ericameria linearifolia	31	0.7	0.2	25.0				
	Gutierrezia microcephala	28	0.5	0.5	5.0				
	Hymenoclea salsola	28	0.4	0.2	5.0				
	Opuntia basilaris	25	0.1	0.1	1.0				
	Gutierrezia sarothrae	24	0.1	0.2	2.0				
	Salvia mohavensis	22	0.3	0.0	4.0				
	Ericameria laricifolia	21	0.5	0.2	6.0				
Herb									
	Sphaeralcea ambigua	69	1.0	0.1	25.0				Y
	Bromus rubens	57	2.1	0.1	20.0				Y
	Achnatherum speciosum	54	0.5	0.2	4.0				Y
	Pleuraphis rigida	50	1.8	0.2	18.0				Y
	Erodium cicutarium	49	0.4	0.2	4.0				

	Eriogonum inflatum	32	0.1	0.1	1.0
	Mirabilis laevis	29	0.1	0.2	1.0
	Xylorhiza tortifolia	26	0.1	0.1	2.0
	Aristida purpurea	22	0.1	0.2	1.0
	Amsinckia	21	0.1	0.1	1.0
Non-vascular					
	Lichen	29	0.2	0.2	3.0

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Eriogonum fasciculatum Rock Outcrop Association

Common Name: California Buckwheat rock outcrop Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1166 m, Range 850 – 1402 m
Slope: Mean 22°, Range 1 – 39°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 11.5%, Range 1 – 35%
Herb Cover: Mean 9.5%, Range 2 – 26%

Surface Covers:

Large Rock: Mean 13.0%, Range 0 – 58%
Small Rock: Mean 56.5%, Range 0 – 98%
Fines: Mean 16.8%, Range 0 – 50%
Litter: Mean 2.5%, Range 0 – 10%

Surveys Used in Description (N =12): DEVA9363, DEVAS042, MOJA9535, MOJC0252, MOJC0267, MOJC0273, MOJC0461, MOJC0826, MOJC0977, MOJC1175, MOJJE117, SLTN0852

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Eriogonum fasciculatum	100	8.6	2.5	43.0	Y		Y	Y
	Ephedra nevadensis	67	1.2	0.5	4.0				Y
	Hymenoclea salsola	58	1.0	1.0	3.0				Y
	Lycium andersonii	58	0.3	0.2	1.0				Y
	Salazaria mexicana	42	0.7	0.5	3.0				
	Ambrosia dumosa	42	0.2	0.2	1.0				
	Cylindropuntia acanthocarpa	33	1.3	1.5	7.0				
	Larrea tridentata	33	0.8	0.5	7.0				
	Gutierrezia microcephala	33	0.5	0.5	5.0				
	Ericameria cooperi	33	0.5	0.2	2.5				
	Grayia spinosa	33	0.5	0.2	3.0				
	Stephanomeria pauciflora	33	0.1	0.2	0.5				
	Viguiera reticulata	33	0.1	0.1	0.5				
	Coleogyne ramosissima	25	0.6	0.1	4.0				
	Psorothamnus	25	0.6	1.0	5.0				

	arborescens					
	Krascheninnikovia lanata	25	0.6	1.0	3.0	
	Yucca baccata	25	0.4	0.5	2.5	
	Krameria erecta	25	0.4	0.5	3.0	
	Ferocactus cylindraceus	25	0.3	0.5	2.0	
	Lepidium fremontii	25	0.3	0.5	2.0	
Herb						
	Bromus rubens	67	4.2	0.5	20.0	Y
	Achnatherum speciosum	58	0.3	0.5	1.0	Y
	Sphaeralcea ambigua	50	0.4	0.1	2.5	Y
	Eriogonum inflatum	50	0.2	0.1	0.5	Y
	Erodium cicutarium	42	0.5	0.5	2.0	
	Mirabilis laevis	42	0.2	0.5	0.5	
	Xylorhiza tortifolia	42	0.2	0.1	0.5	
	Schismus	33	0.3	0.2	2.0	
	Amsinckia	25	0.1	0.1	1.0	
	Cryptantha	25	0.1	0.2	0.5	
Non-vascular						
	Lichen	33	0.2	0.2	2.0	

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Viguiera parishii Association

Common Name: Parish's goldeneye Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1168 m, Range 876 – 1568 m
Slope: Mean 11°, Range 3 – 25°
Aspect: Mostly south-facing

Tree Cover: Mean 0.6%, Range 0 – 1%
Shrub Cover: Mean 9.8%, Range 6 – 17%
Herb Cover: Mean 5.8%, Range 1 – 16%

Surface Covers:

Large Rock: Mean 35.2%, Range 5.2 – 60%
Small Rock: Mean 55.3%, Range 23 – 87%
Fines: Mean 8.6%, Range 0 – 27%
Litter: Mean 0.6%, Range 0 – 3%

Surveys Used in Description (N =14): MOJA9391, MOJAE081, MOJAE084, MOJAE085, MOJAE086, MOJAE087, MOJAE088, MOJAE093, MOJAE205, MOJC0214, MOJC0215, MOJC0405, MOJJE030, MOJJE042

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Viguiera parishii	100	7.4	2.5	20.0	Y		Y	Y
	Eriogonum fasciculatum	93	1.1	0.2	5.0	Y			Y
	Larrea tridentata	71	2.0	0.2	17.0				Y
	Senegalia greggii	71	1.4	1.0	4.6				Y
	Thamnosma montana	64	0.2	0.2	1.0				Y
	Stephanomeria pauciflora	57	0.4	0.2	1.1				Y
	Ephedra viridis	57	0.3	0.2	1.5				Y
	Yucca schidigera	57	0.2	0.2	1.0				Y
	Psilostrophe cooperi	57	0.2	0.2	1.0				Y
	Ambrosia dumosa	50	1.9	0.2	19.0				Y
	Cylindropuntia acanthocarpa	50	0.5	0.2	3.5				Y
	Gutierrezia sarothrae	50	0.3	0.2	2.0				Y
	Salazaria mexicana	43	0.7	0.2	4.0				
	Lotus rigidus	43	0.6	0.2	7.0				
	Salvia dorrii	43	0.6	0.2	4.0				
	Echinocereus engelmannii	43	0.3	0.2	2.0				

	Ericameria linearifolia	43	0.3	0.2	1.5				
	Ephedra nevadensis	36	0.4	0.2	3.0				
	Encelia virginensis	36	0.3	0.2	2.0				
	Senna armata	36	0.3	0.2	3.6				
	Gutierrezia microcephala	29	0.4	0.5	3.0				
	Ferocactus cylindraceus	29	0.3	0.2	2.0				
	Hymenoclea salsola	29	0.2	0.2	1.5				
	Opuntia basilaris	29	0.2	0.2	1.0				
	Bebbia juncea	29	0.1	0.2	1.1				
	Artemisia ludoviciana	29	0.1	0.2	0.5				
	Phoradendron californicum	29	0.1	0.2	0.2				
	Krameria grayi	29	0.1	0.2	0.2				
	Ericameria paniculata	29	0.1	0.2	0.2				
	Lycium andersonii	21	0.4	0.2	5.0				
	Menodora spinescens	21	0.4	0.2	3.0				
	Galium stellatum	21	0.2	0.2	2.0				
	Ambrosia eriocentra	21	0.2	0.2	2.1				
	Eriogonum wrightii	21	0.1	0.5	1.0				
	Atriplex canescens	21	0.1	0.2	1.0				
	Prunus fasciculata	21	0.1	0.2	0.5				
	Krameria erecta	21	0.0	0.2	0.2				
Herb									
	Sphaeralcea ambigua	93	2.5	0.2	25.0	Y			Y
	Bromus rubens	86	2.6	1.0	8.0	Y		Y	Y
	Erodium cicutarium	79	0.9	0.2	4.0	Y			Y
	Pleuraphis rigida	50	1.4	0.2	10.0				Y
	Achnatherum speciosum	50	0.3	0.2	1.0				Y
	Eriogonum inflatum	50	0.2	0.2	0.5				Y
	Dasyochloa pulchella	50	0.1	0.2	0.2				Y
	Penstemon palmeri	36	0.1	0.2	1.0				
	Aristida purpurea	36	0.1	0.2	0.5				
	Mirabilis laevis	36	0.1	0.2	0.2				
	Schismus	29	0.2	0.2	1.0				
	Tridens muticus	29	0.1	0.2	0.2				
	Xylorhiza tortifolia	21	0.2	0.2	2.0				
	Physalis hederifolia	21	0.0	0.2	0.2				
	Oenothera caespitosa	21	0.0	0.2	0.2				
Non-vascular									
	Lichen	29	0.1	0.2	0.5				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Viguiera parishii – Eriogonum fasciculatum Association

Common Name: Desert Sunflower – California Buckwheat Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1157 m, Range 887 – 1429 m
Slope: Mean 19°, Range 0 – 31°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 10.0%, Range 1 – 17%
Herb Cover: Mean 6.4%, Range 2 – 15%

Surface Covers:

Large Rock: Mean 26.4%, Range 0.2 – 70%
Small Rock: Mean 42.2%, Range 10 – 83%
Fines: Mean 7.8%, Range 0 – 20%
Litter: Mean 2.2%, Range 0 – 5%

Surveys Used in Description (N =15): MOJA9404, MOJA9427, MOJA9451, MOJA9688, MOJA9902, MOJA9913, MOJC0095, MOJC0190, MOJC0206, MOJC0208, MOJC1221, MOJJE048, MOJJE056, MOJJE113, MOJJE140

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Eriogonum fasciculatum	100	7.4	0.2	27.0	Y			Y
	Viguiera parishii	100	4.3	0.5	10.0	Y			Y
	Ferocactus cylindraceus	80	1.2	0.2	10.0	Y			Y
	Ephedra nevadensis	73	2.8	0.5	19.0				Y
	Cylindropuntia acanthocarpa	73	2.1	0.2	18.0				Y
	Larrea tridentata	73	2.0	0.2	14.0				Y
	Ambrosia dumosa	67	1.9	0.2	9.0				Y
	Krameria erecta	60	2.1	0.2	21.0				Y
	Echinocereus engelmannii	60	1.3	0.2	10.0				Y
	Senegalia greggii	53	0.8	0.5	3.0				Y
	Yucca schidigera	53	0.7	0.5	3.0				Y
	Encelia farinosa	40	0.5	0.2	3.0				
	Thamnosma montana	40	0.5	0.2	3.0				
	Krameria grayi	40	0.3	0.2	1.5				
	Opuntia basilaris	40	0.1	0.2	0.5				
	Salazaria mexicana	33	0.2	0.2	1.0				

	Stephanomeria pauciflora	33	0.2	0.2	1.0		
	Ephedra viridis	27	1.4	0.5	10.0		
	Lycium andersonii	27	0.2	0.2	2.0		
	Ericameria linearifolia	27	0.2	0.2	2.0		
	Galium stellatum	27	0.2	0.2	1.0		
	Echinocactus polycephalus	27	0.1	0.2	1.0		
	Gutierrezia microcephala	20	0.4	0.5	4.0		
	Ericameria cooperi	20	0.3	0.2	4.0		
	Salvia mohavensis	20	0.2	0.5	2.0		
	Brickellia arguta	20	0.2	0.5	2.0		
	Gutierrezia sarothrae	20	0.1	0.2	1.0		
	Hymenoclea salsola	20	0.1	0.2	1.0		
	Keckiella antirrhinoides	20	0.1	0.2	0.5		
Herb							
	Sphaeralcea ambigua	80	0.8	0.2	5.0	Y	Y
	Erodium cicutarium	73	0.4	0.2	1.0		Y
	Pleuraphis rigida	67	0.8	0.2	6.0		Y
	Bromus rubens	53	0.8	0.2	5.0		Y
	Achnatherum speciosum	53	0.6	0.2	4.0		Y
	Mirabilis laevis	47	0.2	0.2	0.5		
	Xylorhiza tortifolia	40	0.2	0.2	1.0		
	Schismus	27	0.2	0.2	3.0		
	Eriogonum inflatum	27	0.1	0.2	0.5		
	Porophyllum gracile	27	0.1	0.2	0.5		
	Amsinckia	27	0.1	0.2	0.2		
	Salvia columbariae	20	0.3	0.2	3.0		
	Mirabilis	20	0.1	0.2	0.5		
	Aristida purpurea	20	0.1	0.2	0.5		
	Chorizanthe brevicornu	20	0.1	0.2	0.5		
	Cryptantha angustifolia	20	0.1	0.2	0.5		
Non-vascular							
	Lichen	33	0.2	0.2	1.0		

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Eriogonum wrightii – Eriogonum heermannii – Buddleja utahensis Shrubland Alliance

Common Name: Wright's buckwheat – Heermann's buckwheat – Utah butterfly-bush scrub

NVC Alliance Code: A4167. *Eriogonum wrightii - Eriogonum heermannii - Buddleja utahensis* Scrub Alliance

Associations	Sample Size	NVC Code
(Buddleja utahensis – Eriogonum heermannii) – Gutierrezia spp. limestone	3	CEPP005784
*Eriogonum wrightii (*ssp. *subscaposum,* ssp. *wrightii)*	2	CEPP006708

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 1470 m, Range 916 – 1888 m
Slope: Mean 24°, Range 11 – 41°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 7.8%, Range 1 – 12%
Herb Cover: Mean 5.8%, Range 0 – 15%

Surface Covers:

Large Rock: Mean 39.8%, Range 0 – 97%
Small Rock: Mean 33.8%, Range 1 – 74%
Fines: Mean 2.0%, Range 0 – 5%
Litter: Mean 2.0%, Range 0 – 4%

Conservation Status Rank: Global: G3; **State (California):** S3

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**2**	**3**

Surveys Used in Description (N = 5): DEVA0157, MOJA9424, MOJJE442, SLTN0972, SLTN1085

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									

Gutierrezia microcephala	80	1.4	0.1	4.0	Y	Y
Echinocereus engelmannii	60	0.2	0.1	1.0		Y
Eriogonum wrightii	40	6.6	7.0	26.0		
Eriogonum fasciculatum	40	3.4	0.1	17.0		
Buddleja utahensis	40	0.6	1.0	2.0		
Eriogonum heermannii	40	0.1	0.2	0.2		
Echinocereus mojavensis	40	0.1	0.2	0.2		
Thamnosma montana	40	0.1	0.1	0.2		
Echinocactus polycephalus	40	0.0	0.1	0.1		
Ambrosia dumosa	40	0.0	0.1	0.1		
Bebbia juncea	40	0.0	0.1	0.1		
Ericameria linearifolia	20	3.8	19.0	19.0		
Ephedra nevadensis	20	2.6	13.0	13.0		
Gutierrezia sarothrae	20	0.6	3.0	3.0		
Tetracoccus ilicifolius	20	0.6	3.0	3.0		
Yucca baccata	20	0.6	3.0	3.0		
Ephedra californica	20	0.6	3.0	3.0		
Ericameria teretifolia	20	0.4	2.0	2.0		
Artemisia tridentata	20	0.4	2.0	2.0		
Salvia dorrii	20	0.2	1.0	1.0		
Quercus turbinella	20	0.2	1.0	1.0		
Coleogyne ramosissima	20	0.2	1.0	1.0		
Encelia actonii	20	0.2	1.0	1.0		
Larrea tridentata	20	0.2	1.0	1.0		
Yucca schidigera	20	0.1	0.5	0.5		
Scopulophila rixfordii	20	0.0	0.2	0.2		
Brickellia microphylla	20	0.0	0.2	0.2		
Ephedra viridis	20	0.0	0.2	0.2		
Opuntia polyacantha var. erinacea	20	0.0	0.2	0.2		
Escobaria vivipara	20	0.0	0.2	0.2		
Glossopetalon spinescens	20	0.0	0.2	0.2		
Prunus fasciculata	20	0.0	0.2	0.2		
Ericameria cuneata	20	0.0	0.2	0.2		
Opuntia basilaris	20	0.0	0.1	0.1		
Peucephyllum schottii	20	0.0	0.1	0.1		
Psorothamnus arborescens	20	0.0	0.1	0.1		
Eucnide urens	20	0.0	0.1	0.1		

	Lepidium fremontii	20	0.0	0.1	0.1	
	Encelia farinosa	20	0.0	0.1	0.1	
	Brickellia	20	0.0	0.1	0.1	
	Purshia stansburiana	20	0.0	0.1	0.1	
	Lycium	20	0.0	0.1	0.1	
	Pleurocoronis pluriseta	20	0.0	0.1	0.1	
	Atriplex confertifolia	20	0.0	0.1	0.1	
Herb						
	Bromus rubens	60	2.1	0.1	10.0	Y
	Bouteloua gracilis	40	0.8	1.0	3.0	
	Erodium cicutarium	40	0.2	0.2	1.0	
	Cryptantha	40	0.2	0.2	1.0	
	Aristida purpurea	40	0.2	0.1	1.0	
	Gilia	40	0.1	0.1	0.4	
	Achnatherum speciosum	40	0.1	0.2	0.2	
	Arabis	40	0.1	0.1	0.2	
	Sphaeralcea ambigua	40	0.1	0.1	0.2	
	Castilleja	40	0.1	0.1	0.2	
	Galium	40	0.1	0.1	0.2	
	Pleuraphis jamesii	20	1.2	6.0	6.0	
	Lepidium	20	0.4	2.0	2.0	
	Poa secunda	20	0.2	1.0	1.0	
	Achnatherum	20	0.2	1.0	1.0	
	Eriogonum deflexum	20	0.0	0.2	0.2	
	Hymenoxys cooperi	20	0.0	0.2	0.2	
	Bromus tectorum	20	0.0	0.2	0.2	
	Elymus elymoides	20	0.0	0.2	0.2	
	Phacelia rotundifolia	20	0.0	0.2	0.2	
	Erigeron	20	0.0	0.2	0.2	
	Eriogonum inflatum	20	0.0	0.2	0.2	
	Forb (herbaceous, not grass nor grasslike)	20	0.0	0.2	0.2	
	Arenaria kingii	20	0.0	0.2	0.2	
	Penstemon calcareus	20	0.0	0.2	0.2	
	Streptanthus cordatus	20	0.0	0.2	0.2	
	Phacelia fremontii	20	0.0	0.2	0.2	
	Vulpia	20	0.0	0.2	0.2	
	Mimulus rupicola	20	0.0	0.2	0.2	
	Lomatium nevadense	20	0.0	0.2	0.2	
	Linanthus pungens	20	0.0	0.2	0.2	
	Lesquerella kingii	20	0.0	0.2	0.2	
	Descurainia pinnata	20	0.0	0.2	0.2	
	Astragalus panamintensis	20	0.0	0.2	0.2	

	Arenaria macradenia	20	0.0	0.1	0.1
	Graminoid (grass or grasslike)	20	0.0	0.1	0.1
	Mirabilis	20	0.0	0.1	0.1
	Phacelia	20	0.0	0.1	0.1
	Plantago ovata	20	0.0	0.1	0.1
	Cheilanthes	20	0.0	0.1	0.1
	Polemoniaceae	20	0.0	0.1	0.1
Non-vascular					
	Cryptogammic crust	40	0.1	0.2	0.5
	Lichen	20	0.1	0.5	0.5
	Moss	20	0.0	0.2	0.2

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

(Buddleja utahensis – Eriogonum heermannii) – Gutierrezia spp. limestone Association

Common Name: (Utah butterfly-bush – Heermann's buckwheat) – Matchweed limestone Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1217 m, Range 916 – 1817 m
Slope: Mean 31°, Range 26 – 41°
Aspect: Mostly north-facing

Tree Cover: 0%
Shrub Cover: Mean 6.3%, Range 1 – 10%
Herb Cover: Mean 2.7%, Range 0 – 6%

Surface Covers:

Large Rock: Mean 52.3%, Range 0 – 97%
Small Rock: Mean 20.3%, Range 1 – 35%
Fines: Mean 1.0%, Range 0 – 2%
Litter: Mean 1.4%, Range 0 – 2%

Surveys Used in Description (N =3): DEVA0157, SLTN0972, SLTN1085

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Gutierrezia microcephala	100	1.0	0.1	2.0	Y			Y
	Buddleja utahensis	67	1.0	1.0	2.0				Y
	Eriogonum heermannii	67	0.1	0.2	0.2				Y
	Thamnosma montana	67	0.1	0.1	0.2				Y
	Echinocereus engelmannii	67	0.1	0.1	0.1				Y
	Bebbia juncea	67	0.1	0.1	0.1				Y
	Echinocactus polycephalus	67	0.1	0.1	0.1				Y
	Ambrosia dumosa	67	0.1	0.1	0.1				Y
	Tetracoccus ilicifolius	33	1.0	3.0	3.0				
	Ericameria teretifolia	33	0.7	2.0	2.0				
	Encelia actonii	33	0.3	1.0	1.0				
	Salvia dorrii	33	0.3	1.0	1.0				
	Larrea tridentata	33	0.3	1.0	1.0				
	Echinocereus mojavensis	33	0.1	0.2	0.2				

	Ephedra viridis	33	0.1	0.2	0.2	
	Scopulophila rixfordii	33	0.1	0.2	0.2	
	Prunus fasciculata	33	0.1	0.2	0.2	
	Brickellia microphylla	33	0.1	0.2	0.2	
	Ericameria cuneata	33	0.1	0.2	0.2	
	Glossopetalon spinescens	33	0.1	0.2	0.2	
	Pleurocoronis pluriseta	33	0.0	0.1	0.1	
	Eriogonum fasciculatum	33	0.0	0.1	0.1	
	Brickellia	33	0.0	0.1	0.1	
	Eucnide urens	33	0.0	0.1	0.1	
	Atriplex confertifolia	33	0.0	0.1	0.1	
	Lepidium fremontii	33	0.0	0.1	0.1	
	Peucephyllum schottii	33	0.0	0.1	0.1	
	Purshia stansburiana	33	0.0	0.1	0.1	
	Opuntia basilaris	33	0.0	0.1	0.1	
	Psorothamnus arborescens	33	0.0	0.1	0.1	
	Lycium	33	0.0	0.1	0.1	
	Encelia farinosa	33	0.0	0.1	0.1	
Herb						
	Cryptantha	67	0.4	0.2	1.0	Y
	Aristida purpurea	67	0.4	0.1	1.0	Y
	Galium	67	0.1	0.1	0.2	Y
	Bromus rubens	67	0.1	0.1	0.2	Y
	Castilleja	67	0.1	0.1	0.2	Y
	Lepidium	33	0.7	2.0	2.0	
	Erodium cicutarium	33	0.3	1.0	1.0	
	Forb (herbaceous, not grass nor grasslike)	33	0.1	0.2	0.2	
	Eriogonum inflatum	33	0.1	0.2	0.2	
	Astragalus panamintensis	33	0.1	0.2	0.2	
	Mimulus rupicola	33	0.1	0.2	0.2	
	Phacelia fremontii	33	0.1	0.2	0.2	
	Vulpia	33	0.1	0.2	0.2	
	Phacelia rotundifolia	33	0.1	0.2	0.2	
	Eriogonum deflexum	33	0.1	0.2	0.2	
	Penstemon calcareus	33	0.1	0.2	0.2	
	Achnatherum speciosum	33	0.1	0.2	0.2	
	Arenaria kingii	33	0.1	0.2	0.2	
	Linanthus pungens	33	0.1	0.2	0.2	
	Phacelia	33	0.0	0.1	0.1	
	Arabis	33	0.0	0.1	0.1	

	Plantago ovata	33	0.0	0.1	0.1
	Sphaeralcea ambigua	33	0.0	0.1	0.1
	Graminoid (grass or grasslike)	33	0.0	0.1	0.1
	Arenaria macradenia	33	0.0	0.1	0.1
	Gilia	33	0.0	0.1	0.1
	Cheilanthes	33	0.0	0.1	0.1
	Mirabilis	33	0.0	0.1	0.1
	Polemoniaceae	33	0.0	0.1	0.1
Non-vascular					
	Cryptogammic crust	33	0.1	0.2	0.2
	Moss	33	0.1	0.2	0.2

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata Shrubland Alliance

Common Name: Creosote bush scrub

NVC Alliance Code: A3278. *Larrea tridentata - Fouquieria splendens* Upper Bajada & Rock Outcrop Desert Scrub Alliance

Associations	Sample Size	NVC Code
Larrea tridentata	67	CEGL005145
Larrea tridentata – Atriplex confertifolia	5	CEGL001263
Larrea tridentata – Atriplex polycarpa	9	CEGL005765
Larrea tridentata – Ephedra nevadensis	8	CEGL001268
Larrea tridentata – Pleuraphis rigida	9	CEGL005768
Larrea tridentata (alliance)	2	A3278
Larrea tridentata / wash	3	n/a

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 842 m, Range 190 – 1523 m
Slope: Mean 7°, Range 0 – 35°
Aspect: Variable

Tree Cover: Mean 1.2%, Range 0 – 3%
Shrub Cover: Mean 7.2%, Range 1 – 25%
Herb Cover: Mean 5.2%, Range 0 – 34%

Surface Covers:

Large Rock: Mean 8.2%, Range 0 – 100%
Small Rock: Mean 60.4%, Range 0 – 100%
Fines: Mean 26.4%, Range 0 – 95%
Litter: Mean 2.0%, Range 0 – 20%

Conservation Status Rank: Global: G5; **State (California):** S5

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F

Sample size	12	15	58	18

Surveys Used in Description (N = 103): CAMO9101, CAMO9122, DEVA0297, DEVA9177, DEVA9281, DEVA9423, DEVAD071, DEVAD088, DEVAD089, DEVAS024, DEVAS073, DEVAS075, DEVAS078, DEVAS080, DEVAS158, DEVAS163, DEVAS202, MOJA0619, MOJA0926, MOJA9553, MOJA9700, MOJC0066, MOJC0135, MOJC0143, MOJC0158, MOJC0159, MOJC0160, MOJC0198, MOJC0199, MOJC0201, MOJC0203, MOJC0275, MOJC0282, MOJC0283, MOJC0284, MOJC0285, MOJC0308, MOJC0327, MOJC0490, MOJC0491, MOJC0492, MOJC0493, MOJC0521, MOJC0694, MOJC0754, MOJC0757, MOJC0763, MOJC0764, MOJC0776, MOJC0785, MOJC0813, MOJC0856, MOJC0865, MOJC0866, MOJC0916, MOJC0917, MOJC0968, MOJC0969, MOJC0970, MOJC0971, MOJC1031, MOJC1039, MOJC1040, MOJC1041, MOJC1058, MOJC1089, MOJC1105, MOJC1107, MOJC1116, MOJC1135, MOJC1187, MOJC1188, MOJC1189, MOJC1225, MOJD0003, MOJD0006, MOJD0011, MOJD0017, MOJDR007, MOJJE009, MOJJE019, MOJJE038, MOJJE114, MOJJE223, MOJJE323, MOJJE332, MOJJE366, MOJJE496, MOJJE532, MOJJE537, MOJJE541, MOJJE542, MOJJE547, MOJJE551, MOJJE554, SLTN0531, SLTN0727, SLTN0775, SLTN0776, SLTN0854, SLTN0862, SLTN0973, SLTN0974

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	100	12.8	0.5	100.0	Y	Y		Y
	Ambrosia dumosa	42	0.5	0.1	10.0				
	Hymenoclea salsola	24	0.8	0.0	15.0				
	Lycium andersonii	23	0.7	0.1	22.0				
	Krameria erecta	23	0.4	0.2	8.0				
Herb									
	Eriogonum inflatum	40	0.2	0.1	3.0				
	Schismus	39	1.3	0.1	60.0				
	Bromus rubens	28	0.5	0.1	12.0				
	Erodium cicutarium	26	0.7	0.2	20.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata Association

Common Name: Sonoran Creosote Bush Scrub Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 777 m, Range 219 – 1398 m
Slope: Mean 8°, Range 0 – 35°
Aspect: Variable

Tree Cover: Mean 1.6%, Range 0 – 3%
Shrub Cover: Mean 6.3%, Range 1 – 25%
Herb Cover: Mean 4.8%, Range 0 – 34%

Surface Covers:

Large Rock: Mean 7.0%, Range 0 – 55%
Small Rock: Mean 62.4%, Range 0 – 100%
Fines: Mean 23.7%, Range 0 – 95%
Litter: Mean 1.8%, Range 0 – 20%

Surveys Used in Description (N =67): CAMO9101, DEVA9423, DEVAD071, DEVAD088, DEVAD089, DEVAS024, DEVAS073, DEVAS075, DEVAS078, DEVAS080, DEVAS158, DEVAS163, DEVAS202, MOJA0619, MOJA0926, MOJA9700, MOJC0066, MOJC0143, MOJC0158, MOJC0159, MOJC0160, MOJC0198, MOJC0199, MOJC0203, MOJC0275, MOJC0282, MOJC0283, MOJC0284, MOJC0285, MOJC0490, MOJC0491, MOJC0493, MOJC0521, MOJC0694, MOJC0754, MOJC0757, MOJC0764, MOJC0776, MOJC0785, MOJC0856, MOJC0916, MOJC0917, MOJC1031, MOJC1039, MOJC1040, MOJC1041, MOJC1058, MOJC1105, MOJC1116, MOJC1187, MOJC1188, MOJC1189, MOJC1225, MOJD0011, MOJDR007, MOJJE019, MOJJE038, MOJJE323, MOJJE332, MOJJE366, MOJJE496, SLTN0531, SLTN0727, SLTN0776, SLTN0854, SLTN0862, SLTN0973

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	100	12.6	0.5	100.0	Y	Y		Y
	Ambrosia dumosa	45	0.5	0.1	10.0				
	Opuntia basilaris	22	0.1	0.1	0.5				
Herb									
	Eriogonum inflatum	48	0.2	0.1	1.0				
	Schismus	43	1.6	0.1	60.0				
	Erodium cicutarium	27	0.9	0.2	20.0				
	Bromus rubens	25	0.3	0.1	4.0				
	Plantago ovata	24	0.7	0.1	20.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft

= Often

Larrea tridentata – Atriplex polycarpa Association

Common Name: Creosote Bush - Allscale Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 350 m, Range 190 – 799 m
Slope: Mean 2°, Range 1 – 3°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 9.4%, Range 3 – 17%
Herb Cover: Mean 3.6%, Range 0 – 16%

Surface Covers:

Large Rock: Mean 2.3%, Range 0 – 13%
Small Rock: Mean 46.7%, Range 0 – 93%
Fines: Mean 47.6%, Range 5 – 95%
Litter: Mean 1.4%, Range 0 – 8%

Surveys Used in Description (N =9): MOJA9553, MOJC0135, MOJC0763, MOJC0865, MOJC1089, MOJD0003, MOJD0006, MOJD0017, SLTN0974

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Atriplex polycarpa	100	4.5	1.5	10.0	Y		Y	Y
	Larrea tridentata	100	4.2	1.0	7.0	Y		Y	Y
	Ambrosia dumosa	44	1.1	0.2	5.0				
	Atriplex hymenelytra	22	0.2	0.2	1.5				
Herb									
	Schismus	44	2.1	0.5	12.0				
	Camissonia claviformis	33	0.2	0.2	1.0				
	Camissonia	22	0.1	0.2	0.5				
	Cryptantha maritima	22	0.0	0.2	0.2				
	Aliciella latifolia	22	0.0	0.2	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ephedra nevadensis Association

Common Name: Creosote Bush - Nevada Ephedra Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1202 m, Range 860 – 1513 m
Slope: Mean 7°, Range 2 – 16°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 10.2%, Range 3 – 19%
Herb Cover: Mean 7.1%, Range 1 – 20%

Surface Covers:

Large Rock: Mean 11.7%, Range 0.2 – 65%
Small Rock: Mean 75.1%, Range 13 – 93%
Fines: Mean 6.3%, Range 1 – 20%
Litter: Mean 2.8%, Range 0 – 10%

Surveys Used in Description (N =8): DEVA0297, DEVA9177, DEVA9281, MOJC0813, MOJC0971, MOJC1107, MOJC1135, MOJJE009

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	100	6.9	2.0	24.0	Y		Y	Y
	Ephedra nevadensis	100	1.0	0.2	3.0	Y			Y
	Hymenoclea salsola	63	2.1	0.2	15.0				Y
	Krameria erecta	63	0.9	0.5	3.0				Y
	Ericameria cooperi	50	1.1	0.2	7.0				Y
	Grayia spinosa	50	1.0	0.2	5.0				Y
	Lycium andersonii	50	0.5	0.2	1.5				Y
	Tetradymia stenolepis	50	0.5	0.2	2.0				Y
	Salazaria mexicana	50	0.4	0.5	1.0				Y
	Stephanomeria pauciflora	50	0.2	0.2	1.0				Y
	Eriogonum fasciculatum	50	0.2	0.2	1.0				Y
	Encelia actonii	38	0.3	0.2	1.5				
	Echinocactus polycephalus	38	0.2	0.5	0.5				
	Opuntia basilaris	38	0.2	0.5	0.5				
	Coleogyne ramosissima	25	0.4	0.2	3.0				
	Psorothamnus	25	0.2	0.5	1.0				
	Lycium cooperi	25	0.2	0.5	1.0				

	Lepidium fremontii	25	0.1	0.5	0.5			
	Bebbia juncea	25	0.1	0.5	0.5			
	Gutierrezia microcephala	25	0.1	0.5	0.5			
	Encelia farinosa	25	0.1	0.5	0.5			
	Krascheninnikovia lanata	25	0.1	0.2	0.5			
	Ambrosia dumosa	25	0.1	0.2	0.5			
	Amphipappus fremontii	25	0.1	0.2	0.5			
Herb								
	Erodium cicutarium	88	1.5	0.5	3.0	Y		Y
	Bromus rubens	75	3.7	0.5	12.0	Y	Y	Y
	Eriogonum inflatum	63	0.2	0.2	0.5			Y
	Xylorhiza tortifolia	63	0.2	0.2	0.5			Y
	Amsinckia	38	0.6	0.2	4.0			
	Schismus	38	0.2	0.5	0.5			
	Achnatherum speciosum	38	0.2	0.5	0.5			
	Sphaeralcea ambigua	38	0.2	0.2	0.5			
	Lotus	38	0.1	0.2	0.5			
	Mirabilis laevis	38	0.1	0.2	0.5			
	Plant	25	0.1	0.5	0.5			
	Adenophyllum cooperi	25	0.1	0.5	0.5			
	Eriastrum	25	0.1	0.2	0.5			
	Chaenactis	25	0.1	0.2	0.2			
	Vulpia	25	0.1	0.2	0.2			
	Lepidium lasiocarpum	25	0.1	0.2	0.2			

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Pleuraphis rigida Association

Common Name: Creosote Bush - Big Galleta Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1113 m, Range 441 – 1381 m
Slope: Mean 2°, Range 0 – 8°
Aspect: Mostly east-facing

Tree Cover: 0%
Shrub Cover: Mean 3.0%, Range 1 – 5%
Herb Cover: Mean 1.0%, Range 1 – 1%

Surface Covers:

Large Rock: Mean 50.0%, Range 0 – 100%
Small Rock: Mean 28.8%, Range 0 – 58%
Fines: Mean 53.8%, Range 20 – 88%
Litter: Mean 0.2%, Range 0 – 0%

Surveys Used in Description (N =9): MOJC0201, MOJC0866, MOJJE532, MOJJE537, MOJJE541, MOJJE542, MOJJE547, MOJJE551, MOJJE554

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	100	23.2	1.5	41.0	Y	Y		Y
	Lycium andersonii	78	6.3	1.0	22.0	Y			Y
	Hymenoclea salsola	56	3.8	1.0	15.0				Y
	Krameria erecta	56	1.8	0.5	8.0				Y
	Acamptopappus sphaerocephalus	56	1.6	1.0	9.0				Y
	Ericameria cooperi	44	2.3	1.0	12.0				
	Lycium cooperi	44	2.2	1.0	11.0				
	Grayia spinosa	33	1.6	3.0	8.0				
	Gutierrezia microcephala	33	0.8	1.0	5.0				
	Senegalia greggii	33	0.4	1.0	2.0				
	Echinocactus polycephalus	33	0.3	0.5	1.0				
	Acamptopappus shockleyi	22	1.2	5.0	6.0				
	Ephedra nevadensis	22	0.7	2.0	4.0				
	Ambrosia dumosa	22	0.5	0.5	4.0				
	Krascheninnikovia	22	0.4	0.5	3.0				

	lanata							
	Echinocereus engelmannii	22	0.2	1.0	1.0			
Herb								
	Pleuraphis rigida	100	26.4	0.5	54.0	Y	Y	Y
	Muhlenbergia porteri	33	0.9	1.0	6.0			
	Sphaeralcea ambigua	22	0.2	0.5	1.0			

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata / wash Association

Common Name: Creosote Bush Wash Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1092 m, Range 1026 – 1129 m
Slope: Mean 5°, Range 2 – 11°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: 20%
Herb Cover: Mean 20.1%, Range 20 – 20%

Surface Covers:

Large Rock: Mean 65.0%, Range 65 – 65%
Small Rock: Mean 15.0%, Range 15 – 15%
Fines: Mean 15.0%, Range 15 – 15%
Litter: Mean 13.0%, Range 13 – 13%

Surveys Used in Description (N =3): MOJJE114, MOJJE223, SLTN0775

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	100	47.0	12.0	70.0	Y	Y		Y
	Hymenoclea salsola	100	6.4	0.1	11.0	Y			Y
	Thamnosma montana	67	6.3	5.0	14.0				Y
	Senegalia greggii	67	5.3	6.0	10.0				Y
	Salazaria mexicana	67	1.7	1.0	4.0				Y
	Amphipappus fremontii	33	1.7	5.0	5.0				
	Viguiera parishii	33	1.7	5.0	5.0				
	Krameria erecta	33	1.0	3.0	3.0				
	Ambrosia eriocentra	33	0.3	1.0	1.0				
	Cylindropuntia acanthocarpa	33	0.3	1.0	1.0				
	Encelia farinosa	33	0.3	1.0	1.0				
	Stephanomeria pauciflora	33	0.0	0.1	0.1				
	Opuntia basilaris	33	0.0	0.1	0.1				
	Lycium andersonii	33	0.0	0.1	0.1				
	Echinocereus engelmannii	33	0.0	0.1	0.1				
	Ambrosia dumosa	33	0.0	0.1	0.1				

Herb

Muhlenbergia porteri	33	0.3	1.0	1.0
Achnatherum speciosum	33	0.3	1.0	1.0
Cuscuta	33	0.0	0.1	0.1
Sphaeralcea ambigua	33	0.0	0.1	0.1

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa Shrubland Alliance

Common Name: Creosote bush – white bursage scrub

NVC Alliance Code: A3277. *Larrea tridentata - Ambrosia dumosa* Bajada & Valley Desert Scrub Alliance

Associations	**Sample Size**	**NVC Code**
Larrea tridentata – Ambrosia dumosa	109	CEGL002954
Larrea tridentata – Ambrosia dumosa – (Echinocactus polycephalus – Opuntia basilaris)	3	CEPP006718
Larrea tridentata – Ambrosia dumosa – (Ephedra nevadensis – Lycium andersonii)	33	CEGL005755
Larrea tridentata – Ambrosia dumosa – Ambrosia salsola	28	CEGL005761
Larrea tridentata – Ambrosia dumosa – Amphipappus fremontii	7	CEGL005756
Larrea tridentata – Ambrosia dumosa – Atriplex confertifolia	13	CEGL005757
Larrea tridentata – Ambrosia dumosa – Atriplex hymenelytra	5	CEGL005758
Larrea tridentata – Ambrosia dumosa – Cylindropuntia (acanthocarpa, ramosissima)	10	CEPP006719
Larrea tridentata – Ambrosia dumosa – Ephedra funerea	1	CEGL005759
Larrea tridentata – Ambrosia dumosa – Eriogonum fasciculatum	6	CEGL005760
Larrea tridentata – Ambrosia dumosa – Krameria (erecta, grayi)	80	CEGL005137
Larrea tridentata – Ambrosia dumosa – Psorothamnus (arborescens, fremontii)	11	CEPP006720
Larrea tridentata – Ambrosia dumosa – Senna armata	23	CEPP006721
Larrea tridentata – Ambrosia dumosa – Yucca schidigera	6	CEGL005762
Larrea tridentata – Ambrosia dumosa (alliance)	1	A3277
Larrea tridentata – Ambrosia dumosa / Cryptogamic crust	3	CEGL005763

Larrea tridentata – Ambrosia dumosa / Pleuraphis rigida	26	CEGL005764

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 798 m, Range 225 – 1504 m
Slope: Mean 7°, Range 0 – 68°
Aspect: Variable

Tree Cover: Mean 0.2%, Range 0 – 0%
Shrub Cover: Mean 7.9%, Range 1 – 35%
Herb Cover: Mean 4.6%, Range 0 – 25%

Surface Covers:

Large Rock: Mean 5.8%, Range 0 – 70%
Small Rock: Mean 56.4%, Range 0 – 100%
Fines: Mean 32.9%, Range 0 – 95%
Litter: Mean 1.1%, Range 0 – 15%

Conservation Status Rank: Global: G5; **State (California):** S5

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**13**	**27**	**313**	**12**

Surveys Used in Description (N = 365): DEVA9154, DEVA9159, DEVA9172, DEVA9185, DEVA9186, DEVA9187, DEVA9192, DEVA9271, DEVA9272, DEVA9279, DEVA9344, DEVA9359, DEVA9539, DEVAD044, DEVAD086, DEVAD096, DEVAD097, DEVAS021, DEVAS023, DEVAS045, DEVAS077, DEVAS117, DEVAS118, DEVAS155, DEVAS159, DEVAS160, DEVAS162, DEVAS189, MOJA0192, MOJA0403, MOJA9191, MOJA9199, MOJA9462, MOJA9540, MOJA9543, MOJA9546, MOJA9567, MOJA9620, MOJA9638, MOJA9650, MOJA9656, MOJA9661, MOJA9663, MOJA9665, MOJA9676, MOJA9680, MOJA9681, MOJA9682, MOJA9803, MOJA9804, MOJA9806, MOJA9914, MOJA9920, MOJA9922, MOJAE264, MOJC0111, MOJC0112, MOJC0113, MOJC0114, MOJC0118, MOJC0119, MOJC0120, MOJC0122, MOJC0123, MOJC0124, MOJC0125, MOJC0130, MOJC0131, MOJC0132, MOJC0138, MOJC0140, MOJC0141, MOJC0142, MOJC0144, MOJC0145, MOJC0146, MOJC0147, MOJC0187, MOJC0188, MOJC0216, MOJC0217, MOJC0218, MOJC0219, MOJC0220, MOJC0221, MOJC0222, MOJC0223, MOJC0224, MOJC0225, MOJC0229, MOJC0230, MOJC0231, MOJC0236, MOJC0237, MOJC0277, MOJC0278, MOJC0279, MOJC0280, MOJC0281, MOJC0288, MOJC0289, MOJC0290, MOJC0291, MOJC0293, MOJC0304, MOJC0305,

MOJC0306, MOJC0307, MOJC0309, MOJC0310, MOJC0311, MOJC0312, MOJC0313, MOJC0314, MOJC0315, MOJC0324, MOJC0329, MOJC0342, MOJC0345, MOJC0350, MOJC0351, MOJC0355, MOJC0356, MOJC0357, MOJC0367, MOJC0368, MOJC0369, MOJC0370, MOJC0404, MOJC0412, MOJC0422, MOJC0423, MOJC0510, MOJC0511, MOJC0512, MOJC0518, MOJC0519, MOJC0520, MOJC0575, MOJC0670, MOJC0671, MOJC0672, MOJC0673, MOJC0680, MOJC0681, MOJC0683, MOJC0684, MOJC0693, MOJC0737, MOJC0748, MOJC0753, MOJC0755, MOJC0756, MOJC0765, MOJC0773, MOJC0774, MOJC0775, MOJC0778, MOJC0779, MOJC0781, MOJC0782, MOJC0783, MOJC0784, MOJC0786, MOJC0795, MOJC0796, MOJC0811, MOJC0814, MOJC0824, MOJC0831, MOJC0832, MOJC0833, MOJC0840, MOJC0870, MOJC0876, MOJC0880, MOJC0885, MOJC0892, MOJC0893, MOJC0915, MOJC1013, MOJC1014, MOJC1015, MOJC1016, MOJC1019, MOJC1026, MOJC1027, MOJC1028, MOJC1053, MOJC1054, MOJC1055, MOJC1056, MOJC1057, MOJC1059, MOJC1060, MOJC1062, MOJC1104, MOJC1106, MOJC1115, MOJC1117, MOJC1123, MOJC1124, MOJC1125, MOJC1128, MOJC1138, MOJC1139, MOJC1140, MOJC1141, MOJC1142, MOJC1160, MOJC1161, MOJC1164, MOJC1165, MOJC1168, MOJC1170, MOJC1171, MOJC1172, MOJC1173, MOJC1192, MOJC1220, MOJC1224, MOJC1228, MOJC1229, MOJC1232, MOJC1233, MOJD0018, MOJD0106, MOJD0117, MOJDR006, MOJDR115, MOJJE024, MOJJE027, MOJJE028, MOJJE031, MOJJE032, MOJJE034, MOJJE035, MOJJE037, MOJJE039, MOJJE044, MOJJE049, MOJJE050, MOJJE051, MOJJE052, MOJJE053, MOJJE054, MOJJE055, MOJJE058, MOJJE059, MOJJE063, MOJJE065, MOJJE066, MOJJE067, MOJJE069, MOJJE070, MOJJE072, MOJJE075, MOJJE076, MOJJE103, MOJJE104, MOJJE112, MOJJE115, MOJJE122, MOJJE124, MOJJE125, MOJJE127, MOJJE128, MOJJE129, MOJJE130, MOJJE132, MOJJE142, MOJJE143, MOJJE145, MOJJE147, MOJJE148, MOJJE150, MOJJE180, MOJJE183, MOJJE184, MOJJE186, MOJJE187, MOJJE189, MOJJE190, MOJJE192, MOJJE197, MOJJE198, MOJJE201, MOJJE202, MOJJE203, MOJJE210, MOJJE211, MOJJE213, MOJJE214, MOJJE215, MOJJE216, MOJJE219, MOJJE220, MOJJE222, MOJJE226, MOJJE227, MOJJE300, MOJJE312, MOJJE322, MOJJE324, MOJJE326, MOJJE328, MOJJE333, MOJJE334, MOJJE335, MOJJE336, MOJJE337, MOJJE339, MOJJE342, MOJJE344, MOJJE346, MOJJE348, MOJJE349, MOJJE350, MOJJE353, MOJJE354, MOJJE356, MOJJE357, MOJJE359, MOJJE361, MOJJE362, MOJJE363, MOJJE364, MOJJE365, MOJJE495, MOJJE497, MOJJE499, MOJJE500, MOJJE504, MOJJE549, MOJJE573, MOJJE575, MOJJE576, MOJJE577, MOJJE579, MOJJE580, MOJJE581, MOJJE583, MOJJE585, MOJJE590, MOJJE591, MOJJE592, MOJJE593, MOJJE5T2, MOJJE610, MOJJE84b, MOJJE87b, MOJJE89a, MOJJE89b, MOJJE96a, MOJJE96b, SLTN0530, SLTN0536, SLTN0728, SLTN0863, SLTN0866, SLTN0868, SLTN0958, SLTN0975, SLTN1084, SLTN1212

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ambrosia dumosa	100	15.4	0.5	68.0	Y		Y	Y
	Larrea tridentata	100	15.0	1.0	79.0	Y		Y	Y

	Krameria erecta	40	1.9	0.2	33.0
	Hymenoclea salsola	25	0.5	0.1	18.0
	Cylindropuntia ramosissima	25	0.4	0.1	6.0
	Lycium andersonii	22	0.6	0.1	23.0
	Senna armata	21	0.6	0.1	36.0
Herb					
	Schismus	44	1.2	0.1	40.0
	Eriogonum inflatum	25	0.1	0.1	8.0
	Erodium cicutarium	25	0.2	0.1	8.0
	Pleuraphis rigida	24	1.1	0.2	39.0
	Bromus rubens	21	0.4	0.1	30.0

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa Association

Common Name: Creosote Bush – White Bursage Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 672 m, Range 271 – 1275 m
Slope: Mean 7°, Range 1 – 40°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 6.6%, Range 1 – 35%
Herb Cover: Mean 3.8%, Range 0 – 25%

Surface Covers:

Large Rock: Mean 5.6%, Range 0 – 58%
Small Rock: Mean 49.4%, Range 0 – 100%
Fines: Mean 38.3%, Range 0 – 94%
Litter: Mean 0.6%, Range 0 – 7%

Surveys Used in Description (N =109): DEVA9154, DEVA9185, DEVA9187, DEVA9272, DEVAD044, DEVAD086, DEVAD097, DEVAS021, DEVAS023, DEVAS189, MOJA9199, MOJA9462, MOJA9543, MOJA9546, MOJA9638, MOJA9656, MOJA9676, MOJA9803, MOJA9806, MOJC0118, MOJC0119, MOJC0120, MOJC0122, MOJC0124, MOJC0125, MOJC0140, MOJC0141, MOJC0142, MOJC0220, MOJC0221, MOJC0236, MOJC0280, MOJC0305, MOJC0310, MOJC0311, MOJC0312, MOJC0313, MOJC0314, MOJC0315, MOJC0350, MOJC0351, MOJC0356, MOJC0357, MOJC0367, MOJC0510, MOJC0511, MOJC0512, MOJC0520, MOJC0671, MOJC0672, MOJC0673, MOJC0680, MOJC0681, MOJC0683, MOJC0684, MOJC0693, MOJC0755, MOJC0774, MOJC0781, MOJC0782, MOJC0783, MOJC0784, MOJC0786, MOJC0795, MOJC0796, MOJC0814, MOJC0831, MOJC0832, MOJC0833, MOJC0840, MOJC0870, MOJC0876, MOJC0892, MOJC0893, MOJC1028, MOJC1053, MOJC1054, MOJC1055, MOJC1057, MOJC1059, MOJC1060, MOJC1062, MOJC1115, MOJC1168, MOJC1170, MOJD0106, MOJDR115, MOJJE035, MOJJE039, MOJJE044, MOJJE067, MOJJE103, MOJJE186, MOJJE203, MOJJE339, MOJJE353, MOJJE354, MOJJE356, MOJJE359, MOJJE364, MOJJE365, MOJJE585, MOJJE89b, MOJJE96b, SLTN0530, SLTN0536, SLTN0958, SLTN0975, SLTN1084

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	100	10.5	1.0	71.0	Y		Y	Y
	Ambrosia dumosa	100	10.3	0.5	68.0	Y		Y	Y
Herb									

Schismus	48	1.2	0.1	20.0
Eriogonum inflatum	26	0.1	0.1	0.5
Erodium cicutarium	21	0.2	0.1	8.0

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa – (Ephedra nevadensis – Lycium andersonii) Association

Common Name: Creosote Bush – White Bursage – (Nevada Joint Fir – Anderson's Boxthorn) Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 970 m, Range 659 – 1504 m
Slope: Mean 6°, Range 0 – 31°
Aspect: Variable

Tree Cover: Mean 0.2%, Range 0 – 0%
Shrub Cover: Mean 11.0%, Range 3 – 30%
Herb Cover: Mean 6.2%, Range 0 – 16%

Surface Covers:

Large Rock: Mean 11.7%, Range 0 – 35%
Small Rock: Mean 60.1%, Range 35 – 92%
Fines: Mean 23.9%, Range 1 – 63%
Litter: Mean 2.3%, Range 0 – 15%

Surveys Used in Description (N =33): DEVA9344, DEVAS160, DEVAS162, MOJA9922, MOJC0147, MOJC1026, MOJC1138, MOJC1140, MOJC1161, MOJC1164, MOJC1165, MOJD0018, MOJJE024, MOJJE028, MOJJE049, MOJJE051, MOJJE053, MOJJE054, MOJJE058, MOJJE059, MOJJE065, MOJJE066, MOJJE072, MOJJE147, MOJJE187, MOJJE190, MOJJE219, MOJJE222, MOJJE326, MOJJE350, MOJJE593, MOJJE610, SLTN0863

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ambrosia dumosa	100	24.2	0.5	63.0	Y		Y	Y
	Larrea tridentata	100	22.5	2.0	78.0	Y		Y	Y
	Lycium andersonii	79	4.1	1.0	23.0	Y			Y
	Krameria erecta	48	2.1	1.0	13.0				
	Ephedra nevadensis	45	1.8	1.0	12.0				
	Thamnosma montana	33	0.6	0.1	5.0				
	Hymenoclea salsola	30	0.5	0.2	9.0				
	Cylindropuntia ramosissima	27	0.5	0.2	6.0				
	Acamptopappus sphaerocephalus	24	1.7	2.0	20.0				
	Grayia spinosa	24	0.8	0.5	10.0				

	Ephedra californica	21	0.7	1.0	8.0
Herb					
	Bromus rubens	30	1.3	0.1	15.0
	Xylorhiza tortifolia	30	0.3	0.2	2.0
	Erodium cicutarium	27	0.6	0.2	6.0
	Schismus	27	0.3	0.1	3.0
	Eriogonum inflatum	21	0.1	0.2	1.0

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa – Ambrosia salsola Association

Common Name: Creosote Bush – White Bursage – Cheesebush Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 796 m, Range 352 – 1230 m
Slope: Mean 5°, Range 1 – 22°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 8.7%, Range 2 – 19%
Herb Cover: Mean 3.7%, Range 1 – 7%

Surface Covers:

Large Rock: Mean 8.0%, Range 0 – 68%
Small Rock: Mean 59.8%, Range 0 – 98%
Fines: Mean 27.5%, Range 2 – 63%
Litter: Mean 1.1%, Range 0 – 6%

Surveys Used in Description (N =28): DEVA9186, DEVAS118, MOJA9650, MOJA9920, MOJAE264, MOJC0130, MOJC0144, MOJC0145, MOJC0146, MOJC0222, MOJC0670, MOJC1013, MOJC1015, MOJC1027, MOJC1123, MOJC1141, MOJC1142, MOJDR006, MOJJE055, MOJJE076, MOJJE124, MOJJE213, MOJJE328, MOJJE336, MOJJE361, MOJJE504, MOJJE583, MOJJE84b

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	100	15.3	2.0	69.0	Y		Y	Y
	Ambrosia dumosa	100	14.2	0.5	66.0	Y		Y	Y
	Hymenoclea salsola	100	3.9	0.5	18.0	Y			Y
	Krameria erecta	39	0.9	0.2	6.0				
	Lycium andersonii	29	0.2	0.2	2.0				
	Senna armata	25	0.5	0.2	8.0				
	Salazaria mexicana	25	0.2	0.2	1.5				
	Ephedra californica	21	2.5	0.5	28.0				
	Cylindropuntia ramosissima	21	0.6	0.2	5.0				
	Senegalia greggii	21	0.5	0.5	5.0				
	Grayia spinosa	21	0.1	0.2	1.5				
Herb									
	Schismus	50	1.7	0.2	30.0				Y
	Bromus rubens	36	0.5	0.5	10.0				
	Erodium cicutarium	32	0.4	0.5	3.0				

Xylorhiza tortifolia	29	0.1	0.1	1.0
Eriogonum inflatum	21	0.1	0.1	2.0
Mirabilis laevis	21	0.1	0.2	0.5

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa – Amphipappus fremontii Association

Common Name: Creosote Bush - White Bursage - Fremont's Chaff-bush Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 910 m, Range 735 – 1299 m
Slope: Mean 20°, Range 9 – 29°
Aspect: Mostly north-facing

Tree Cover: 0%
Shrub Cover: Mean 12.0%, Range 5 – 20%
Herb Cover: Mean 7.3%, Range 2 – 21%

Surface Covers:

Large Rock: Mean 27.8%, Range 0 – 70%
Small Rock: Mean 58.1%, Range 15 – 92%
Fines: Mean 5.7%, Range 1 – 10%
Litter: Mean 2.0%, Range 0 – 10%

Surveys Used in Description (N =7): DEVA9159, DEVA9279, DEVAS159, MOJC0111, MOJC0114, MOJC0811, MOJJE592

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	100	9.6	2.5	37.0	Y		Y	Y
	Ambrosia dumosa	100	7.9	1.0	20.0	Y			Y
	Amphipappus fremontii	100	4.1	1.0	14.0	Y			Y
	Encelia farinosa	71	1.4	0.5	5.0				Y
	Galium stellatum	57	0.5	0.1	2.0				Y
	Eriogonum fasciculatum	43	0.2	0.2	1.0				
	Krameria erecta	29	0.8	0.5	5.0				
	Lycium andersonii	29	0.6	1.0	3.0				
	Viguiera reticulata	29	0.4	0.5	2.0				
	Acamptopappus shockleyi	29	0.1	0.2	0.5				
	Opuntia basilaris	29	0.1	0.1	0.5				
Herb									
	Sphaeralcea ambigua	57	0.7	0.2	4.0				Y
	Pleuraphis rigida	43	1.4	0.5	8.0				
	Bromus rubens	43	1.1	0.5	6.0				
	Xylorhiza tortifolia	43	0.2	0.2	1.0				
	Schismus	29	0.6	2.0	2.0				

	Achnatherum speciosum	29	0.1	0.5	0.5
	Erodium cicutarium	29	0.1	0.5	0.5
	Eriogonum inflatum	29	0.1	0.2	0.5
	Forb (herbaceous, not grass nor grasslike)	29	0.1	0.2	0.2
	Chaenactis	29	0.1	0.2	0.2
	Gilia	29	0.1	0.2	0.2
	Plantago ovata	29	0.0	0.1	0.2
	Phacelia crenulata	29	0.0	0.1	0.2
Non-vascular					
	Lichen	29	0.1	0.5	0.5

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa – Atriplex confertifolia Association

Common Name: Creosote Bush – White Bursage – Shadscale Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 924 m, Range 678 – 1501 m
Slope: Mean 7°, Range 1 – 29°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 10.9%, Range 2 – 22%
Herb Cover: Mean 5.5%, Range 2 – 11%

Surface Covers:

Large Rock: Mean 0.6%, Range 0 – 5%
Small Rock: Mean 48.1%, Range 0 – 98%
Fines: Mean 42.7%, Range 1 – 63%
Litter: Mean 0.9%, Range 0 – 6%

Surveys Used in Description (N =13): DEVA9359, MOJC0131, MOJC0132, MOJC0306, MOJC0307, MOJC0309, MOJC1019, MOJC1104, MOJC1128, MOJC1171, MOJC1172, MOJC1173, SLTN0728

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ambrosia dumosa	100	5.0	2.0	10.0	Y		Y	Y
	Larrea tridentata	100	4.5	2.0	7.5	Y		Y	Y
	Atriplex confertifolia	85	1.3	0.5	4.0	Y			Y
	Lycium andersonii	31	0.3	0.5	1.5				
	Ephedra nevadensis	31	0.1	0.1	1.0				
	Lepidium fremontii	23	0.2	0.5	1.5				
	Krascheninnikovia lanata	23	0.2	0.5	1.5				
	Acamptopappus shockleyi	23	0.2	0.5	1.0				
Herb									
	Schismus	85	4.3	0.5	17.0	Y		Y	Y
	Erodium cicutarium	77	0.7	0.5	3.0	Y			Y
	Bromus rubens	69	0.5	0.2	2.0				Y
	Eriogonum inflatum	38	0.1	0.1	0.5				
	Xylorhiza tortifolia	38	0.1	0.1	0.5				
	Plant	23	0.1	0.5	0.5				
	Cryptantha	23	0.1	0.2	0.5				
	Mirabilis laevis	23	0.1	0.2	0.5				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa – Atriplex hymenelytra Association

Common Name: Creosote Bush-White Bursage-Desert-holly Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 837 m, Range 632 – 946 m
Slope: Mean 16°, Range 4 – 24°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 9.4%, Range 1 – 35%
Herb Cover: Mean 6.9%, Range 1 – 16%

Surface Covers:

Large Rock: Mean 6.6%, Range 1 – 15%
Small Rock: Mean 81.0%, Range 73 – 94%
Fines: Mean 6.6%, Range 3 – 10%
Litter: Mean 0.4%, Range 0 – 1%

Surveys Used in Description (N =5): DEVA9271, DEVAD096, MOJC0289, MOJC0290, MOJC0880

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	100	5.2	1.0	17.0	Y		Y	Y
	Ambrosia dumosa	100	4.9	0.5	15.0	Y		Y	Y
	Atriplex hymenelytra	100	1.8	1.0	3.0	Y			Y
	Echinocactus polycephalus	40	0.2	0.5	0.5				
	Krameria erecta	40	0.2	0.5	0.5				
	Opuntia basilaris	40	0.1	0.2	0.5				
	Psorothamnus arborescens	40	0.1	0.2	0.5				
	Lycium cooperi	20	0.3	1.5	1.5				
	Lycium andersonii	20	0.2	1.0	1.0				
	Atriplex confertifolia	20	0.2	1.0	1.0				
	Amphipappus fremontii	20	0.1	0.5	0.5				
	Menodora spinescens	20	0.1	0.5	0.5				
	Ephedra californica	20	0.1	0.5	0.5				
	Ephedra nevadensis	20	0.1	0.5	0.5				
	Lepidium fremontii	20	0.1	0.5	0.5				
	Grayia spinosa	20	0.1	0.5	0.5				
	Eriogonum fasciculatum	20	0.1	0.5	0.5				

Herb						
	Schismus	60	0.7	0.5	2.0	Y
	Cryptantha	40	0.2	0.2	1.0	
	Eremalche rotundifolia	40	0.2	0.1	1.0	
	Atrichoseris platyphylla	40	0.2	0.1	1.0	
	Bromus rubens	40	0.2	0.5	0.5	
	Cuscuta	40	0.1	0.2	0.5	
	Eriogonum inflatum	40	0.1	0.2	0.5	
	Chorizanthe brevicornu	20	1.0	5.0	5.0	
	Plantago ovata	20	0.6	3.0	3.0	
	Camissonia	20	0.6	3.0	3.0	
	Mentzelia albicaulis	20	0.4	2.0	2.0	
	Coreopsis bigelovii	20	0.4	2.0	2.0	
	Calycoseris	20	0.2	1.0	1.0	
	Camissonia boothii	20	0.2	1.0	1.0	
	Poa secunda	20	0.2	1.0	1.0	
	Camissonia claviformis	20	0.1	0.5	0.5	
	Lomatium	20	0.1	0.5	0.5	
	Erodium cicutarium	20	0.1	0.5	0.5	
	Gilia	20	0.0	0.2	0.2	
	Chorizanthe rigida	20	0.0	0.2	0.2	
	Lepidium lasiocarpum	20	0.0	0.2	0.2	
	Phacelia crenulata	20	0.0	0.2	0.2	
	Vulpia	20	0.0	0.2	0.2	
	Chaenactis	20	0.0	0.2	0.2	
	Mohavea breviflora	20	0.0	0.1	0.1	
	Camissonia brevipes	20	0.0	0.1	0.1	
	Ipomopsis polycladon	20	0.0	0.1	0.1	
	Eschscholzia glyptosperma	20	0.0	0.1	0.1	

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa – Cylindropuntia (acanthocarpa, ramosissima) Association

Common Name: Creosote Bush – White Bursage – Cholla Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 721 m, Range 337 – 1003 m
Slope: Mean 4°, Range 1 – 12°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 7.5%, Range 2 – 18%
Herb Cover: Mean 5.3%, Range 1 – 14%

Surface Covers:

Large Rock: Mean 0.1%, Range 0 – 0%
Small Rock: Mean 75.6%, Range 38 – 100%
Fines: Mean 24.6%, Range 10 – 38%
Litter: Mean 1.3%, Range 0 – 3%

Surveys Used in Description (N =10): MOJA0403, MOJC0885, MOJC0915, MOJC1224, MOJJE142, MOJJE349, MOJJE357, MOJJE499, MOJJE579, MOJJE591

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ambrosia dumosa	100	28.2	1.0	59.0	Y		Y	Y
	Larrea tridentata	100	21.1	2.0	64.0	Y		Y	Y
	Cylindropuntia ramosissima	90	2.0	0.2	6.0	Y			Y
	Cylindropuntia echinocarpa	70	1.2	0.2	5.0				Y
	Cylindropuntia acanthocarpa	60	2.8	0.5	9.0				Y
	Krameria erecta	60	0.9	0.5	2.0				Y
	Eriogonum fasciculatum	50	0.5	0.2	2.0				Y
	Acamptopappus sphaerocephalus	30	2.3	0.2	20.0				
	Krameria grayi	30	0.9	1.0	7.0				
	Echinocereus engelmannii	30	0.4	0.2	3.0				
	Yucca schidigera	30	0.2	0.2	1.0				
	Ferocactus cylindraceus	20	0.3	1.0	2.0				

	Thamnosma montana	20	0.2	1.0	1.0
	Lycium andersonii	20	0.2	1.0	1.0
	Opuntia basilaris	20	0.1	0.2	0.5
Herb					
	Pleuraphis rigida	40	1.9	1.0	9.0
	Eriogonum inflatum	30	0.2	0.5	1.0
	Schismus	20	0.1	0.2	0.5
Non-vascular					
	Cryptogammic crust	20	1.3	0.2	13.0

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa – Ephedra funerea Association

Common Name: Creosote Bush - White Bursage - Death Valley Ephedra Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 980 m, Range 980 – 980 m
Slope: Mean 15°, Range 15 – 15°
Aspect: Southwest-facing

Tree Cover: 0%
Shrub Cover: 9%
Herb Cover: 1%

Surface Covers:

Large Rock: 15%
Small Rock: 65%
Fines: 14%
Litter: 5%

Surveys Used in Description (N =1): DEVAS117

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Hymenoclea salsola	100	2.0	2.0	2.0	Y			Y
	Larrea tridentata	100	2.0	2.0	2.0	Y			Y
	Ephedra funerea	100	2.0	2.0	2.0	Y			Y
	Lycium andersonii	100	2.0	2.0	2.0	Y			Y
	Ambrosia dumosa	100	1.0	1.0	1.0	Y			Y
	Ericameria teretifolia	100	0.1	0.1	0.1	Y			Y
	Eriogonum fasciculatum	100	0.1	0.1	0.1	Y			Y
Herb									
	Phacelia	100	0.1	0.1	0.1	Y		Y	Y
	Sphaeralcea ambigua	100	0.1	0.1	0.1	Y		Y	Y
	Cryptantha	100	0.1	0.1	0.1	Y		Y	Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa – Krameria (erecta, grayi) Association

Common Name: Creosote Bush – White Bursage – Rhatany Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 853 m, Range 544 – 1211 m
Slope: Mean 6°, Range 1 – 68°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 7.3%, Range 2 – 15%
Herb Cover: Mean 4.9%, Range 1 – 12%

Surface Covers:

Large Rock: Mean 5.3%, Range 0 – 30%
Small Rock: Mean 72.5%, Range 38 – 98%
Fines: Mean 17.8%, Range 1 – 47%
Litter: Mean 0.9%, Range 0 – 8%

Surveys Used in Description (N =80): MOJA9191, MOJA9540, MOJA9567, MOJA9665, MOJA9680, MOJA9681, MOJA9804, MOJC0113, MOJC0123, MOJC0187, MOJC0188, MOJC0217, MOJC0219, MOJC0224, MOJC0225, MOJC0230, MOJC0277, MOJC0278, MOJC0279, MOJC0281, MOJC0324, MOJC0355, MOJC0369, MOJC0423, MOJC0824, MOJC1014, MOJC1106, MOJC1229, MOJC1232, MOJC1233, MOJJE027, MOJJE031, MOJJE032, MOJJE034, MOJJE037, MOJJE050, MOJJE052, MOJJE063, MOJJE069, MOJJE070, MOJJE115, MOJJE122, MOJJE125, MOJJE129, MOJJE130, MOJJE148, MOJJE150, MOJJE180, MOJJE183, MOJJE184, MOJJE189, MOJJE192, MOJJE197, MOJJE198, MOJJE202, MOJJE214, MOJJE215, MOJJE220, MOJJE226, MOJJE300, MOJJE312, MOJJE324, MOJJE333, MOJJE334, MOJJE335, MOJJE342, MOJJE344, MOJJE346, MOJJE348, MOJJE362, MOJJE495, MOJJE497, MOJJE500, MOJJE549, MOJJE573, MOJJE576, MOJJE577, MOJJE580, MOJJE581, MOJJE590

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	100	24.6	2.0	72.0	Y		Y	Y
	Ambrosia dumosa	100	24.3	0.5	68.0	Y		Y	Y
	Krameria erecta	73	5.4	0.2	33.0				Y
	Cylindropuntia ramosissima	40	0.6	0.2	6.0				
	Krameria grayi	33	0.9	0.2	13.0				
	Senna armata	31	0.5	0.2	6.0				
	Eriogonum fasciculatum	26	0.8	0.2	8.0				

	Cylindropuntia acanthocarpa	26	0.7	0.2	9.0
	Cylindropuntia echinocarpa	24	0.2	0.2	3.0
	Ferocactus cylindraceus	23	0.2	0.2	3.0
	Opuntia basilaris	23	0.2	0.2	2.0
	Thamnosma montana	21	0.5	0.2	14.0
Herb					
	Schismus	30	0.6	0.2	8.0
	Pleuraphis rigida	26	0.8	0.2	18.0
	Eriogonum inflatum	25	0.2	0.2	8.0

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa – Senna armata Association

Common Name: Creosote Bush - White Bursage - Spiny Senna Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 937 m, Range 715 – 1221 m
Slope: Mean 5°, Range 1 – 30°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 6.5%, Range 2 – 16%
Herb Cover: Mean 5.2%, Range 2 – 10%

Surface Covers:

Large Rock: Mean 0.7%, Range 0 – 5%
Small Rock: Mean 55.4%, Range 38 – 98%
Fines: Mean 41.7%, Range 10 – 63%
Litter: Mean 0.7%, Range 0 – 4%

Surveys Used in Description (N =23): MOJC0138, MOJC0288, MOJC0291, MOJC0293, MOJC0329, MOJC0368, MOJC0370, MOJC0404, MOJC0412, MOJC0422, MOJC0748, MOJC1124, MOJC1228, MOJD0117, MOJJE075, MOJJE104, MOJJE112, MOJJE127, MOJJE128, MOJJE132, MOJJE145, MOJJE216, MOJJE337

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ambrosia dumosa	100	15.1	0.5	50.0	Y		Y	Y
	Larrea tridentata	100	12.1	1.0	65.0	Y			Y
	Senna armata	96	6.3	1.0	36.0	Y			Y
	Krameria erecta	52	3.4	0.5	14.0				Y
	Hymenoclea salsola	43	0.3	0.5	1.0				
	Cylindropuntia ramosissima	39	0.7	0.2	4.0				
	Eriogonum fasciculatum	35	1.3	0.5	10.0				
	Thamnosma montana	30	0.5	0.5	4.0				
	Lycium andersonii	30	0.4	0.5	2.0				
	Salazaria mexicana	30	0.3	0.5	3.0				
	Ephedra californica	30	0.2	0.5	1.0				
	Krameria grayi	26	0.3	0.5	2.0				
	Yucca schidigera	26	0.2	0.2	1.0				
	Cylindropuntia acanthocarpa	22	0.8	0.5	6.0				
	Echinocereus engelmannii	22	0.5	1.0	4.0				

	Acamptopappus sphaerocephalus	22	0.3	0.5	2.0	
	Cylindropuntia echinocarpa	22	0.1	0.5	1.0	
Herb						
	Schismus	61	3.3	0.5	40.0	Y
	Erodium cicutarium	43	0.3	0.2	1.0	
	Pleuraphis rigida	26	1.0	0.5	14.0	
	Eriogonum inflatum	26	0.1	0.5	0.5	
	Bromus rubens	22	0.2	0.5	1.0	

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa – Yucca schidigera Association

Common Name: Creosote Bush - White Bursage - Mojave Yucca Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 866 m, Range 671 – 1042 m
Slope: Mean 3°, Range 2 – 10°
Aspect: Mostly south-facing

Tree Cover: 0%
Shrub Cover: Mean 12.2%, Range 7 – 17%
Herb Cover: Mean 6.4%, Range 3 – 10%

Surface Covers:

Large Rock: Mean 1.3%, Range 0 – 3%
Small Rock: Mean 81.5%, Range 63 – 90%
Fines: Mean 16.5%, Range 5 – 38%
Litter: Mean 2.3%, Range 0 – 4%

Surveys Used in Description (N =6): MOJA9682, MOJA9914, MOJC0216, MOJC0218, MOJC1220, MOJJE5T2

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ambrosia dumosa	100	14.5	5.5	55.0	Y		Y	Y
	Larrea tridentata	100	9.5	4.0	29.0	Y			Y
	Yucca schidigera	100	2.3	1.0	3.0	Y			Y
	Krameria erecta	83	1.0	0.2	2.0	Y			Y
	Eriogonum fasciculatum	67	0.5	0.2	1.0				Y
	Cylindropuntia acanthocarpa	67	0.5	0.2	1.5				Y
	Cylindropuntia ramosissima	67	0.3	0.2	0.5				Y
	Krameria grayi	50	0.6	0.5	2.0				Y
	Ferocactus cylindraceus	50	0.3	0.2	1.0				Y
	Senna armata	50	0.3	0.2	1.0				Y
	Opuntia basilaris	50	0.2	0.2	0.5				Y
	Encelia farinosa	50	0.2	0.2	0.5				Y
	Salazaria mexicana	33	0.2	0.2	1.0				
	Thamnosma montana	33	0.2	0.2	1.0				
	Ephedra nevadensis	33	0.2	0.5	0.5				
	Psorothamnus fremontii	33	0.1	0.2	0.5				
	Echinocereus engelmannii	33	0.1	0.2	0.5				

	Stephanomeria pauciflora	33	0.1	0.2	0.5		
	Senegalia greggii	33	0.1	0.2	0.5		
	Viguiera parishii	33	0.1	0.2	0.2		
	Bebbia juncea	33	0.1	0.2	0.2		
Herb							
	Pleuraphis rigida	67	1.9	0.5	9.0		Y
	Schismus	67	1.1	0.5	3.0		Y
	Bromus rubens	67	0.2	0.2	0.5		Y
	Erodium cicutarium	50	0.2	0.2	0.5		Y
	Eriogonum inflatum	33	0.3	0.5	1.0		
	Porophyllum gracile	33	0.2	0.5	0.5		
	Antheropeas	33	0.1	0.2	0.5		
	Chaenactis fremontii	33	0.1	0.2	0.5		
	Xylorhiza tortifolia	33	0.1	0.2	0.2		
	Plantago ovata	33	0.1	0.2	0.2		
Non-vascular							
	Cryptogammic crust	67	0.5	0.5	1.0		Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa / Pleuraphis rigida Association

Common Name: Creosote Bush - White Bursage - Big Galleta Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 689 m, Range 354 – 1031 m
Slope: Mean 7°, Range 1 – 26°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 5.5%, Range 1 – 15%
Herb Cover: Mean 5.8%, Range 1 – 18%

Surface Covers:

Large Rock: Mean 2.3%, Range 0 – 30%
Small Rock: Mean 30.7%, Range 0 – 83%
Fines: Mean 63.7%, Range 0 – 95%
Litter: Mean 1.3%, Range 0 – 7%

Surveys Used in Description (N =26): MOJA0192, MOJA9620, MOJA9661, MOJA9663, MOJC0112, MOJC0231, MOJC0304, MOJC0342, MOJC0345, MOJC0737, MOJC0753, MOJC0756, MOJC0773, MOJC0775, MOJC0778, MOJC0779, MOJC1192, MOJJE143, MOJJE201, MOJJE227, MOJJE322, MOJJE363, MOJJE575, MOJJE87b, MOJJE89a, MOJJE96a

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Ambrosia dumosa	100	13.7	1.0	61.0	Y		Y	Y
	Larrea tridentata	100	13.0	1.0	79.0	Y		Y	Y
	Cylindropuntia echinocarpa	38	0.5	0.2	6.0				
	Krameria erecta	31	1.8	0.5	10.0				
	Cylindropuntia ramosissima	23	0.4	0.2	4.0				
Herb									
	Pleuraphis rigida	100	8.4	0.5	39.0	Y	Y		Y
	Schismus	62	1.4	0.2	20.0				Y
	Cryptantha	27	0.1	0.2	1.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Ambrosia dumosa / Pleuraphis rigida Association

Larrea tridentata – Encelia farinosa Shrubland Alliance

Common Name: Creosote bush – brittle bush scrub

NVC Alliance Code: A3278. *Larrea tridentata - Fouquieria splendens* Upper Bajada & Rock Outcrop Desert Scrub Alliance

Associations	Sample Size	NVC Code
Larrea tridentata – Encelia farinosa	11	CEGL002955
Larrea tridentata – Encelia farinosa – Ambrosia dumosa	13	CEGL005766
Larrea tridentata – Encelia farinosa – Bebbia juncea	8	CEPP006723
Larrea tridentata – Encelia farinosa – Pleurocoronis pluriseta	7	CEGL005767

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 735 m, Range 294 – 1005 m
Slope: Mean 21°, Range 1 – 97°
Aspect: Mostly south-facing

Tree Cover: 1%
Shrub Cover: Mean 6.1%, Range 1 – 33%
Herb Cover: Mean 5.4%, Range 0 – 16%

Surface Covers:

Large Rock: Mean 29.8%, Range 0 –83%
Small Rock: Mean 60.0%, Range 13 – 98%
Fines: Mean 10.5%, Range 1 – 57%
Litter: Mean 1.2%, Range 0 – 15%

Conservation Status Rank: Global: G5; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size		**7**	**27**	**5**

Surveys Used in Description (N = 39): DEVA9191, DEVA9347, DEVAD085, DEVAS151, MOJA9184, MOJC0115, MOJC0116, MOJC0121, MOJC0126, MOJC0129, MOJC0162, MOJC0163, MOJC0164, MOJC0183, MOJC0184, MOJC0207,

MOJC0238, MOJC0325, MOJC0326, MOJC0397, MOJC0398, MOJC0411, MOJC0563, MOJC0695, MOJC0812, MOJC0871, MOJC0872, MOJC0877, MOJC0878, MOJC0886, MOJC0926, MOJC1186, MOJC1190, MOJC1191, MOJC1193, MOJC1223, MOJDR116, MOJJE033, SLTN0537

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Encelia farinosa	100	5.2	0.5	54.0	Y		Y	Y
	Larrea tridentata	100	3.7	1.0	16.0	Y		Y	Y
	Ambrosia dumosa	90	1.7	0.1	13.0	Y			Y
	Opuntia basilaris	44	0.2	0.1	0.5				
	Bebbia juncea	28	0.3	0.5	5.0				
	Stephanomeria pauciflora	28	0.1	0.1	0.5				
	Krameria grayi	23	0.2	0.2	1.5				
	Pleurocoronis pluriseta	21	0.3	0.2	3.0				
	Echinocactus polycephalus	21	0.1	0.1	0.5				
Herb									
	Schismus	44	0.3	0.2	2.0				
	Eriogonum inflatum	38	0.2	0.1	0.5				
	Aristida purpurea	26	0.1	0.5	0.5				
	Pleuraphis rigida	21	0.1	0.5	1.0				
Non-vascular									
	Lichen	21	0.1	0.2	1.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Encelia farinosa Association

Common Name: Creosote Bush – Brittlebush Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 711 m, Range 294 – 989 m
Slope: Mean 22°, Range 6 – 35°
Aspect: Mostly south-facing

Tree Cover: 1%
Shrub Cover: Mean 4.4%, Range 1 – 13%
Herb Cover: Mean 4.6%, Range 0 – 9%

Surface Covers:

Large Rock: Mean 37.1%, Range 0.4 – 78%
Small Rock: Mean 51.3%, Range 13 – 83%
Fines: Mean 10.3%, Range 1 – 38%
Litter: Mean 0.8%, Range 0 – 3%

Surveys Used in Description (N =11): MOJC0121, MOJC0162, MOJC0163, MOJC0238, MOJC0695, MOJC0871, MOJC0877, MOJC0926, MOJC1193, MOJC1223, SLTN0537

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Encelia farinosa	100	4.1	1.0	8.0	Y		Y	Y
	Larrea tridentata	100	3.2	1.0	6.0	Y		Y	Y
	Ambrosia dumosa	64	0.3	0.1	0.5				Y
	Opuntia basilaris	36	0.2	0.5	0.5				
	Eriogonum fasciculatum	27	0.1	0.5	0.5				
Herb									
	Schismus	45	0.3	0.5	1.0				
	Aristida purpurea	36	0.2	0.5	0.5				
	Bromus rubens	36	0.2	0.5	0.5				
	Dasyochloa pulchella	27	0.1	0.5	0.5				
	Erodium cicutarium	27	0.1	0.5	0.5				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Encelia farinosa – Ambrosia dumosa Association

Common Name: Creosote Bush - Brittlebush - White Bursage Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 736 m, Range 400 – 996 m
Slope: Mean 16°, Range 1 – 30°
Aspect: Mostly south-facing

Tree Cover: 0%
Shrub Cover: Mean 6.5%, Range 2 – 17%
Herb Cover: Mean 6.8%, Range 2 – 16%

Surface Covers:

Large Rock: Mean 13.2%, Range 0 – 30%
Small Rock: Mean 70.4%, Range 35 – 98%
Fines: Mean 15.7%, Range 3 – 57%
Litter: Mean 2.6%, Range 0 – 15%

Surveys Used in Description (N =13): DEVA9347, DEVAS151, MOJA9184, MOJC0115, MOJC0116, MOJC0183, MOJC0184, MOJC0207, MOJC0398, MOJC0878, MOJC1191, MOJDR116, MOJJE033

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Encelia farinosa	100	7.1	0.5	54.0	Y			Y
	Larrea tridentata	100	4.3	1.0	16.0	Y			Y
	Ambrosia dumosa	100	3.5	0.5	13.0	Y			Y
	Krameria grayi	46	0.5	0.2	1.5				
	Opuntia basilaris	38	0.1	0.1	0.5				
	Stephanomeria pauciflora	31	0.2	0.5	0.5				
	Krameria erecta	23	1.1	0.2	13.0				
Herb									
	Eriogonum inflatum	38	0.2	0.5	0.5				
	Schismus	31	0.2	0.2	1.0				
	Dalea mollissima	31	0.2	0.5	0.5				
	Aristida purpurea	31	0.2	0.5	0.5				
	Pleuraphis rigida	23	0.2	0.5	1.0				
Non-vascular									
	Lichen	23	0.1	0.5	0.5				
	Cryptogammic crust	23	0.1	0.2	0.5				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max

= Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Encelia farinosa – Bebbia juncea Association

Common Name: Creosote Bush - Brittlebush - Sweetbush Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 705 m, Range 463 – 985 m
Slope: Mean 25°, Range 5 – 97°
Aspect: Mostly south-facing

Tree Cover: 0%
Shrub Cover: Mean 9.6%, Range 1 – 33%
Herb Cover: Mean 3.8%, Range 1 – 8%

Surface Covers:

Large Rock: Mean 14.0%, Range 2.7 – 50%
Small Rock: Mean 84.3%, Range 73 – 98%
Fines: Mean 9.6%, Range 3 – 38%
Litter: Mean 0.5%, Range 0 – 3%

Surveys Used in Description (N =8): DEVAD085, MOJC0126, MOJC0164, MOJC0411, MOJC0563, MOJC0812, MOJC0872, MOJC1186

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Encelia farinosa	100	4.8	1.0	13.0	Y		Y	Y
	Larrea tridentata	100	4.1	1.0	10.0	Y			Y
	Bebbia juncea	100	1.4	0.5	5.0	Y			Y
	Ambrosia dumosa	100	0.6	0.1	1.0	Y			Y
	Opuntia basilaris	63	0.3	0.1	0.5				Y
	Stephanomeria pauciflora	50	0.2	0.1	0.5				Y
	Echinocactus polycephalus	50	0.2	0.1	0.5				Y
	Krameria erecta	25	0.1	0.5	0.5				
Herb									
	Eriogonum inflatum	75	0.3	0.1	0.5	Y			Y
	Schismus	50	0.3	0.5	1.0				Y
	Mirabilis laevis	38	0.2	0.5	0.5				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Larrea tridentata – Encelia farinosa – Pleurocoronis pluriseta Provisional Association

Common Name: Creosote Bush – Brittlebush – Bush Arrowleaf Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 806 m, Range 420 – 1005 m
Slope: Mean 25°, Range 1 – 39°
Aspect: Mostly west-facing

Tree Cover: 0%
Shrub Cover: Mean 4.7%, Range 2 – 9%
Herb Cover: Mean 6.0%, Range 2 – 9%

Surface Covers:

Large Rock: Mean 60.4%, Range 40 – 83%
Small Rock: Mean 33.0%, Range 20 – 65%
Fines: Mean 3.6%, Range 3 – 10%
Litter: Mean 0.3%, Range 0 – 1%

Surveys Used in Description (N =7): DEVA9191, MOJC0129, MOJC0325, MOJC0326, MOJC0397, MOJC0886, MOJC1190

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Encelia farinosa	100	4.0	0.5	8.5	Y		Y	Y
	Larrea tridentata	100	3.1	1.0	5.0	Y			Y
	Ambrosia dumosa	100	2.0	0.5	5.5	Y			Y
	Pleurocoronis pluriseta	100	1.6	0.2	3.0	Y			Y
	Galium stellatum	43	0.2	0.2	1.0				
	Opuntia basilaris	43	0.2	0.5	0.5				
	Stephanomeria pauciflora	43	0.2	0.2	0.5				
	Amphipappus fremontii	29	0.1	0.2	0.5				
Herb									
	Schismus	57	0.7	0.2	2.0				Y
	Pleuraphis rigida	43	0.2	0.5	0.5				
	Mirabilis	43	0.2	0.2	0.5				
	Physalis crassifolia	29	0.1	0.5	0.5				
	Cheilanthes parryi	29	0.1	0.5	0.5				
	Mirabilis laevis	29	0.1	0.5	0.5				
	Sphaeralcea ambigua	29	0.1	0.5	0.5				
	Adenophyllum porophylloides	29	0.1	0.5	0.5				

	Nicotiana obtusifolia	29	0.1	0.5	0.5
	Aristida purpurea	29	0.1	0.5	0.5
	Eriogonum inflatum	29	0.1	0.2	0.5
	Xylorhiza tortifolia	29	0.1	0.2	0.5
Non-vascular					
	Lichen	43	0.3	0.2	1.0
	Cryptogammic crust	29	0.2	0.5	1.0

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Lepidospartum squamatum Shrubland Alliance

Common Name: Scale broom scrub

NVC Alliance Code: A4188. *Hymenoclea salsola - Bebbia juncea* Mojave-Sonoran Desert Wash Scrub Alliance

Associations	Sample Size	NVC Code
Lepidospartum squamatum – Eriodictyon trichocalyx – Hesperoyucca whipplei	5	n/a
Lepidospartum squamatum – Eriogonum fasciculatum	2	n/a
Lepidospartum squamatum / ephemeral annuals	5	n/a

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 849 m, Range 653 – 1006 m
Slope: Mean 3°, Range 1 – 4°
Aspect: Southeast facing

Tree Cover: 0%
Shrub Cover: Mean 16.5%, Range 10 – 23%
Herb Cover: Mean 3.8%, Range 0 – 41%

Surface Covers:

Large Rock: Mean 0.6%, Range 0 – 7%
Small Rock: Mean 11.5%, Range 0 – 91%
Fines: Mean 73.3%, Range 3 – 95%
Litter: Mean 0.9%, Range 0 – 6%

Conservation Status Rank: Global: G3; **State (California):** S3

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**12**	

Surveys Used in Description (N = 12): ALLF042, ALLF043, ALLF044, ALLF045, ALLF046, ALLF047, ALLF076, ALLF077, ALLF078, ALLF079, ALSCLPC1, ALSCLPC2

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Lepidospartum squamatum	92	17.6	7.0	32.0	Y	Y		Y
	Eriogonum fasciculatum	67	1.3	1.0	4.0				Y
	Hesperoyucca whipplei	58	2.3	1.0	16.0				Y
	Eriodictyon trichocalyx	50	1.8	1.0	10.0				Y
	Senecio flaccidus	42	1.0	1.0	8.0				
	Cercocarpus montanus var. glaber	42	0.4	1.0	1.0				
	Ceanothus crassifolius	25	0.2	0.2	1.0				
	Rhamnus ilicifolia	25	0.2	0.2	1.0				
Herb									
	Bromus rubens	100	7.3	1.0	25.0	Y			Y
	Schismus	92	3.3	0.2	9.0	Y			Y
	Ambrosia acanthicarpa	75	1.8	1.0	6.0	Y			Y
	Erodium cicutarium	75	1.8	1.0	7.0	Y			Y
	Bromus tectorum	67	1.8	0.2	5.0				Y
	Hirschfeldia incana	58	1.7	0.0	9.0				Y
	Eriogonum gracile	58	0.7	0.0	4.0				Y
	Eriastrum densifolium	58	0.7	1.0	2.0				Y
	Salvia columbariae	50	1.4	0.2	13.0				Y
	Bromus diandrus	42	1.4	0.2	9.0				
	Stephanomeria exigua	42	1.3	1.0	5.0				
	Logfia californica	42	0.6	0.0	5.0				
	Cryptantha micrantha	42	0.6	1.0	3.0				
	Cryptantha intermedia	42	0.4	0.2	1.0				
	Phacelia distans	33	0.8	1.0	6.0				
	Chaenactis fremontii	33	0.6	1.0	3.0				
	Cryptantha circumscissa	33	0.3	1.0	1.0				
	Gilia brecciarum	33	0.3	1.0	1.0				
	Langloisia setosissima	33	0.3	1.0	1.0				
	Rafinesquia neomexicana	33	0.3	1.0	1.0				
	Achnatherum speciosum	25	1.2	2.0	7.0				
	Avena barbata	25	0.5	0.2	5.0				
	Vulpia myuros	25	0.4	0.2	3.0				
	Chaenactis glabriuscula	25	0.3	0.2	2.0				
	Malacothrix glabrata	25	0.3	1.0	1.0				
	Nemacladus rubescens	25	0.3	1.0	1.0				
	Navarretia hamata	25	0.3	1.0	1.0				

	Camissonia boothii	25	0.3	1.0	1.0	
	Lupinus horizontalis var. horizontalis	25	0.3	1.0	1.0	
	Galium angustifolium	25	0.3	1.0	1.0	
	Eschscholzia minutiflora	25	0.3	1.0	1.0	
	Pectocarya linearis	25	0.2	0.0	1.0	
	Emmenanthe penduliflora	25	0.1	0.0	1.0	
Non-vascular						
	Moss	67	0.7	0.2	2.0	Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Prunus fasciculata – Salazaria mexicana Shrubland Alliance

Common Name: Desert almond – Mexican bladdersage scrub

NVC Alliance Code: A4185. *Prunus fasciculata - Salazaria mexicana* Northern Mojave Desert Wash Scrub Alliance

Associations	**Sample Size**	**NVC Code**
Ambrosia salsola – Salazaria mexicana	10	CEGL002703
Keckiella antirrhinoides – Prunus fasciculata	1	CEPP006717
Prunus eremophila	1	CEPP006740
Prunus fasciculata	8	CEGL002704
Prunus fasciculata – (Purshia stansburiana – Viguiera reticulata)	3	CEGL006863
Prunus fasciculata – Ambrosia eriocentra	13	CEGL005773
Prunus fasciculata – Rhus trilobata	2	CEPP006741
Salazaria mexicana	17	CEGL005293
Salvia dorrii Wash	5	CEGL005774

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 1384 m, Range 809 – 1742 m
Slope: Mean 8°, Range 1 – 33°
Aspect: Variable

Tree Cover: Mean 1.8%, Range 0 – 6%
Shrub Cover: Mean 17.1%, Range 2 – 49%
Herb Cover: Mean 7.6%, Range 0 – 39%

Surface Covers:

Large Rock: Mean 15.3%, Range 0 – 75%
Small Rock: Mean 56.3%, Range 0 – 96%
Fines: Mean 17.1%, Range 0 – 88%
Litter: Mean 3.9%, Range 0 – 30%

Conservation Status Rank: Global: G4; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**1**		**52**	**7**

Surveys Used in Description (N = 60): CAMO8101, CAMO9121, MOJA0292, MOJA0409, MOJA0411, MOJA0587, MOJA0690, MOJA0808, MOJA9135, MOJA9291, MOJA9293, MOJA9299, MOJA9357, MOJA9359, MOJA9387, MOJA9388, MOJA9430, MOJA9455, MOJA9504, MOJA9507, MOJA9510, MOJA9572, MOJA9618, MOJA9672, MOJA9692, MOJAE073, MOJAE074, MOJAE075, MOJAE240, MOJAE241, MOJAE243, MOJAE244, MOJAE245, MOJAE247, MOJAN001, MOJC0015, MOJC0016, MOJC0209, MOJC0266, MOJC0292, MOJC0352, MOJC0593, MOJC0759, MOJC0986, MOJC0999, MOJC1023, MOJC1025, MOJC1090, MOJC1102, MOJC1122, MOJC1126, MOJC1129, MOJC1162, MOJJE093, MOJJE272, MOJJE273, MOJJE601, MOJJE643, SLTN0770, SLTN0976

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Yucca brevifolia	25	0.2	0.1	3.0				
Shrub									
	Salazaria mexicana	67	3.5	0.2	21.0				Y
	Prunus fasciculata	62	3.4	0.1	25.0				Y
	Eriogonum fasciculatum	57	0.7	0.2	4.0				Y
	Ephedra nevadensis	55	0.8	0.2	8.0				Y
	Hymenoclea salsola	48	1.4	0.1	17.0				
	Yucca baccata	48	0.5	0.2	10.0				
	Cylindropuntia acanthocarpa	43	0.4	0.2	4.0				
	Stephanomeria pauciflora	42	0.1	0.1	1.0				
	Salvia dorrii	40	0.9	0.2	18.0				
	Thamnosma montana	40	0.6	0.2	11.0				
	Senegalia greggii	40	0.6	0.2	6.0				
	Gutierrezia microcephala	37	0.9	0.2	18.0				
	Ericameria linearifolia	33	0.6	0.2	13.0				
	Gutierrezia sarothrae	32	0.4	0.2	5.0				
	Ambrosia eriocentra	28	1.2	1.0	13.1				
	Artemisia ludoviciana	25	0.2	0.2	4.0				
	Echinocereus engelmannii	23	0.1	0.2	0.5				
	Purshia glandulosa	20	0.3	0.0	8.0				

	Lycium andersonii	20	0.3	0.2	3.0			
	Ephedra viridis	20	0.2	0.2	4.0			
Herb								
	Bromus rubens	83	2.4	0.2	19.0	Y		Y
	Erodium cicutarium	67	2.0	0.1	30.0			Y
	Sphaeralcea ambigua	55	0.6	0.1	8.0			Y
	Achnatherum speciosum	47	0.4	0.1	7.0			
	Amsinckia	33	0.1	0.2	1.0			
	Eriogonum inflatum	30	0.1	0.2	0.5			
	Mirabilis laevis	28	0.1	0.2	0.5			
	Salvia columbariae	23	0.1	0.2	1.5			
	Eriogonum	22	0.1	0.2	3.0			
	Elymus elymoides	22	0.1	0.0	0.5			
	Penstemon palmeri	22	0.0	0.2	0.2			
	Pleuraphis rigida	20	1.2	0.2	50.0			
	Bromus tectorum	20	0.3	0.2	8.0			
	Cryptantha	20	0.1	0.1	2.0			

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Ambrosia salsola – Salazaria mexicana Provisional Association

Common Name: Cheesebush – Bladder Sage Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1263 m, Range 954 – 1605 m
Slope: Mean 9°, Range 2 – 33°
Aspect: Mostly north-facing

Tree Cover: 1%
Shrub Cover: Mean 15.0%, Range 8 – 23%
Herb Cover: Mean 3.3%, Range 1 – 7%

Surface Covers:

Large Rock: Mean 9.3%, Range 0 – 50%
Small Rock: Mean 30.6%, Range 10 – 90%
Fines: Mean 45.9%, Range 0 – 88%
Litter: Mean 0.5%, Range 0 – 3%

Surveys Used in Description (N =10): MOJC0292, MOJC1023, MOJC1025, MOJC1090, MOJC1102, MOJC1122, MOJC1126, MOJC1129, MOJJE093, MOJJE643

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Yucca brevifolia	30	0.2	0.5	1.0				
Shrub									
	Salazaria mexicana	100	5.3	1.5	15.0	Y			Y
	Hymenoclea salsola	100	4.6	1.0	17.0	Y			Y
	Ephedra nevadensis	80	1.2	0.5	2.5	Y			Y
	Ambrosia dumosa	70	1.3	0.5	4.0				Y
	Lycium andersonii	70	0.7	0.5	1.5				Y
	Grayia spinosa	60	0.6	0.5	1.5				Y
	Larrea tridentata	50	1.4	0.5	4.0				Y
	Acamptopappus sphaerocephalus	50	1.3	0.5	9.0				Y
	Eriogonum fasciculatum	50	0.8	0.5	3.5				Y
	Lepidium fremontii	50	0.4	0.5	1.0				Y
	Tetradymia stenolepis	40	2.0	0.5	18.0				
	Thamnosma montana	40	1.5	1.0	11.0				
	Krascheninnikovia lanata	40	0.4	0.5	1.5				
	Stephanomeria	40	0.2	0.5	0.5				

	pauciflora						
	Cylindropuntia echinocarpa	30	0.2	0.5	0.5		
	Ericameria cooperi	20	3.6	0.5	35.0		
	Atriplex confertifolia	20	0.2	1.0	1.0		
	Cylindropuntia ramosissima	20	0.2	0.5	1.0		
	Krameria erecta	20	0.1	0.5	0.5		
	Encelia actonii	20	0.1	0.5	0.5		
Herb							
	Bromus rubens	80	1.0	0.5	5.0	Y	Y
	Achnatherum speciosum	60	0.6	0.5	3.0		Y
	Mirabilis laevis	60	0.3	0.5	0.5		Y
	Eriogonum inflatum	60	0.3	0.5	0.5		Y
	Schismus	50	0.5	0.5	2.0		Y
	Erodium cicutarium	50	0.3	0.5	1.0		Y
	Pleuraphis rigida	30	5.2	1.0	50.0		
	Xylorhiza tortifolia	30	0.2	0.5	0.5		
	Stanleya elata	30	0.2	0.5	0.5		
	Achnatherum hymenoides	30	0.2	0.5	0.5		
	Sphaeralcea ambigua	20	0.1	0.5	0.5		

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Salazaria mexicana Association

Common Name: Bladder Sage Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1408 m, Range 809 – 1742 m
Slope: Mean 14°, Range 2 – 33°
Aspect: Variable

Tree Cover: Mean 1.0%, Range 1 – 2%
Shrub Cover: Mean 19.2%, Range 8 – 45%
Herb Cover: Mean 14.1%, Range 2 – 39%

Surface Covers:

Large Rock: Mean 15.8%, Range 0 – 50%
Small Rock: Mean 58.6%, Range 10 – 92%
Fines: Mean 10.0%, Range 0 – 20%

Litter: Mean 5.0%, Range 0 – 30%

Surveys Used in Description (N =17): MOJA0587, MOJA0690, MOJA9388, MOJA9572, MOJA9618, MOJA9672, MOJA9692, MOJC0209, MOJC0352, MOJC0593, MOJC0759, MOJC0986, MOJC1162, MOJJE272, MOJJE273, SLTN0770, SLTN0976

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Juniperus osteosperma	24	0.0	0.0	0.2				
Shrub									
	Salazaria mexicana	100	8.6	2.0	21.0	Y		Y	Y
	Ephedra nevadensis	65	1.4	0.2	8.0				Y
	Eriogonum fasciculatum	59	0.9	0.2	4.0				Y
	Thamnosma montana	53	0.7	0.5	3.0				Y
	Yucca baccata	53	0.4	0.2	2.0				Y
	Stephanomeria pauciflora	53	0.2	0.1	1.0				Y
	Prunus fasciculata	41	0.4	0.1	2.0				
	Gutierrezia microcephala	35	2.2	0.5	18.0				
	Gutierrezia sarothrae	35	1.1	1.0	5.0				
	Ericameria linearifolia	35	1.0	0.5	5.0				
	Senegalia greggii	35	0.4	0.2	3.0				
	Cylindropuntia acanthocarpa	35	0.4	0.2	2.0				
	Hymenoclea salsola	29	0.9	0.1	7.0				
	Lycium andersonii	29	0.5	0.2	3.0				
	Ephedra viridis	29	0.4	0.2	4.0				
	Grayia spinosa	29	0.2	0.1	1.0				
	Opuntia basilaris	29	0.1	0.1	0.5				
	Lycium cooperi	29	0.1	0.1	0.5				
	Coleogyne ramosissima	24	1.3	0.2	12.0				
	Larrea tridentata	24	1.2	0.5	15.0				
	Salvia mohavensis	24	0.5	0.5	3.0				
	Eriogonum wrightii	24	0.4	0.2	4.0				
	Lotus rigidus	24	0.3	0.2	3.0				
	Ambrosia dumosa	24	0.2	0.1	2.0				
	Tetradymia stenolepis	24	0.2	0.2	1.0				
	Ericameria cooperi	24	0.1	0.5	1.0				
Herb									
	Bromus rubens	82	4.6	0.5	19.0	Y			Y
	Sphaeralcea ambigua	76	1.6	0.1	8.0	Y			Y
	Erodium cicutarium	65	4.4	0.1	30.0				Y
	Achnatherum speciosum	41	0.6	0.2	7.0				
	Eriogonum inflatum	41	0.2	0.2	0.5				

	Eriogonum	41	0.2	0.2	1.0
	Pleuraphis rigida	35	0.8	0.2	7.0
	Amsinckia	35	0.1	0.2	1.0
	Plagiobothrys	29	0.2	0.2	1.0
	Chamaesyce albomarginata	29	0.1	0.1	0.5
	Bromus tectorum	24	0.2	0.2	2.0
	Xylorhiza tortifolia	24	0.1	0.5	0.5
	Mirabilis	24	0.1	0.1	0.5
	Elymus elymoides	24	0.1	0.0	0.5
	Cryptantha	24	0.0	0.1	0.2
Non-vascular					
	Lichen	24	0.1	0.2	0.5

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Salix exigua Shrubland Alliance

Common Name: Sandbar willow thickets

NVC Alliance Code: A0947. *Salix exigua* Warm Desert Wet Shrubland Alliance

Associations	Sample Size	NVC Code
Salix exigua (alliance)	2	A0947
Salix exigua / Baccharis sergiloides	5	CEPP006753

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 1358 m, Range 1226 – 1558 m
Slope: Mean 9°, Range 2 – 14°
Aspect: Mostly south-facing

Tree Cover: Mean 21.4%, Range 0 – 77%
Shrub Cover: Mean 30.7%, Range 13 – 72%
Herb Cover: Mean 5.0%, Range 0 – 10%

Surface Covers:

Large Rock: Mean 31.3%, Range 0.2 – 71%
Small Rock: Mean 34.9%, Range 1 – 65%
Fines: Mean 12.1%, Range 0 – 28%
Litter: Mean 30.1%, Range 0 – 91%

Conservation Status Rank: Global: G5; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**7**	

Surveys Used in Description (N = 7): MOJA0912, MOJA9574, MOJA9698, MOJAE009, MOJAE195, MOJAE199, MOJAE202

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Pinus monophylla	57	0.8	0.2	3.0				Y
	Prosopis glandulosa	29	0.3	1.0	1.1				

Shrub								
	Salix exigua	100	34.3	4.6	70.0	Y	Y	Y
	Senegalia greggii	100	0.8	0.2	3.1	Y		Y
	Eriogonum fasciculatum	86	0.2	0.2	0.2	Y		Y
	Lotus rigidus	86	0.2	0.2	0.2	Y		Y
	Baccharis sergiloides	71	6.3	4.0	20.0			Y
	Rhus trilobata	71	1.9	1.0	5.0			Y
	Prunus fasciculata	71	0.8	0.2	3.0			Y
	Artemisia ludoviciana	71	0.6	0.2	2.1			Y
	Brickellia californica	71	0.3	0.2	1.0			Y
	Ericameria linearifolia	71	0.1	0.2	0.2			Y
	Ferocactus cylindraceus	57	0.1	0.2	0.2			Y
	Viguiera parishii	57	0.1	0.2	0.2			Y
	Rhamnus ilicifolia	43	1.4	2.0	6.0			
	Phoradendron californicum	43	0.4	0.2	2.1			
	Gutierrezia microcephala	43	0.3	0.2	1.1			
	Ephedra viridis	43	0.1	0.2	0.2			
	Opuntia chlorotica	43	0.1	0.2	0.2			
	Yucca schidigera	43	0.1	0.2	0.2			
	Eriogonum wrightii	43	0.1	0.2	0.2			
	Tamarix ramosissima	43	0.1	0.2	0.2			
	Stephanomeria pauciflora	43	0.1	0.2	0.2			
	Frangula californica ssp. ursina	29	5.7	3.0	37.0			
	Fallugia paradoxa	29	3.9	12.0	15.0			
	Gutierrezia sarothrae	29	0.2	0.2	1.0			
	Echinocereus engelmannii	29	0.1	0.2	0.2			
	Cylindropuntia acanthocarpa	29	0.1	0.2	0.2			
	Ericameria cuneata	29	0.1	0.2	0.2			
	Ericameria laricifolia	29	0.1	0.2	0.2			
	Lycium andersonii	29	0.0	0.0	0.2			
Herb								
	Bromus rubens	100	4.2	0.2	8.0	Y	Y	Y
	Erodium cicutarium	86	0.4	0.2	2.0	Y		Y
	Achnatherum speciosum	86	0.2	0.2	0.2	Y		Y
	Mirabilis laevis	71	0.1	0.2	0.2			Y
	Sphaeralcea ambigua	71	0.1	0.2	0.2			Y
	Juncus mexicanus	57	1.6	0.2	6.0			Y

	Muhlenbergia rigens	57	1.3	0.2	7.0	Y
	Epilobium	57	0.3	0.2	1.0	Y
	Sonchus oleraceus	57	0.1	0.2	0.2	Y
	Cirsium neomexicanum	57	0.1	0.2	0.2	Y
	Juncus macrophyllus	43	0.1	0.2	0.2	
	Oenothera caespitosa	43	0.1	0.2	0.2	
	Melica frutescens	43	0.1	0.2	0.2	
	Schismus	43	0.1	0.2	0.2	
	Dudleya pulverulenta	43	0.1	0.2	0.2	
	Euphorbia	43	0.1	0.0	0.2	
	Bromus diandrus	29	0.5	0.5	3.0	
	Polypogon monspeliensis	29	0.3	0.2	2.0	
	Galium	29	0.1	0.2	0.2	
	Physalis	29	0.1	0.2	0.2	
	Nicotiana obtusifolia	29	0.1	0.2	0.2	
	Bothriochloa barbinodis	29	0.1	0.2	0.2	
	Datura wrightii	29	0.1	0.2	0.2	
	Melica imperfecta	29	0.1	0.2	0.2	
	Sisyrinchium halophilum	29	0.1	0.2	0.2	
	Oenothera primiveris	29	0.1	0.2	0.2	
	Typha	29	0.1	0.2	0.2	
	Bromus tectorum	29	0.1	0.2	0.2	
Non-vascular						
	Moss	43	0.2	0.2	1.0	
	Lichen	29	0.1	0.2	0.2	

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Sarcobatus vermiculatus Shrubland Alliance

Common Name: Greasewood scrub

NVC Alliance Code: A1046. *Sarcobatus vermiculatus* Intermountain Wet Shrubland Alliance

Associations	Sample Size	NVC Code
Atriplex parryi	3	CEGL002711
Sarcobatus vermiculatus – Atriplex confertifolia – (Picrothamnus desertorum, Suaeda moquinii)	1	CEGL001371
Sarcobatus vermiculatus – Suaeda moquinii	3	CEGL001370
Sarcobatus vermiculatus (alliance)	1	A1046
Sarcobatus vermiculatus / Distichlis spicata	1	CEGL001363

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 978 m, Range 280 – 1169 m
Slope: Mean 1°, Range 0 – 1°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 4.4%, Range 2 – 13%
Herb Cover: Mean 1.7%, Range 1 – 2%

Surface Covers:

Large Rock: Mean 0.0%, Range 0 – 0%
Small Rock: Mean 1.4%, Range 0 – 3%
Fines: Mean 87.5%, Range 88 – 88%
Litter: Mean 1.4%, Range 0 – 3%

Conservation Status Rank: Global: G5; **State (California):** S3S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**9**	

Surveys Used in Description (N = 9): MOJC0021, MOJC0845, OVAA04446,

OVAA04502, OVAA04851, OVAA06103, OVAA08528, OVAA08608, OVAA09489

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Sarcobatus vermiculatus	78	4.0	1.0	10.0	Y		Y	Y
	Suaeda moquinii	56	2.2	0.2	15.0				Y
	Atriplex parryi	56	1.2	0.2	5.0				Y
	Atriplex confertifolia	44	0.8	0.2	3.0				
	Standing snag	44	0.6	1.0	2.0				
	Atriplex canescens	33	0.5	0.1	4.0				
	Ambrosia dumosa	22	0.3	0.5	2.0				
	Ericameria nauseosa	22	0.2	0.2	2.0				
Herb									
	Cleomella obtusifolia	67	0.8	0.2	3.0				Y
	Endolepis covillei	33	0.4	0.2	3.0				
	Sporobolus airoides	22	0.6	1.0	4.0				
	Cleome sparsifolia	22	0.2	0.1	2.0				
	Distichlis spicata	22	0.2	1.0	1.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Senegalia greggii – Hyptis emoryi – Justicia californica Shrubland Alliance

Common Name: Catclaw acacia – desert lavender – chuparosa scrub

NVC Alliance Code: A4187. *Acacia greggii - Hyptis emoryi - Justicia californica* Desert Wash Scrub Alliance

Associations	Sample Size	NVC Code
Hyptis emoryi	2	CEGL002960
Senegalia greggii – (Ambrosia eriocentra – Salvia dorrii)	6	CEGL005737
Senegalia greggii – (Bebbia juncea – Hyptis emoryi)	2	n/a
Senegalia greggii – Ambrosia salsola	17	CEGL009522
Senegalia greggii – Eriogonum fasciculatum	4	CEPP005785
Senegalia greggii – Prunus fasciculata	18	CEGL005738
Senegalia greggii – Viguiera parishii	6	CEPP005786
Senegalia greggii Wash	3	CEGL005390

Classification Comments: None.

Plot/Sample Data Summary:
Elevation: Mean 1179 m, Range 338 – 1586 m
Slope: Mean 7°, Range 0 – 37°
Aspect: Mostly south-facing

Tree Cover: Mean 2.3%, Range 0 – 6%
Shrub Cover: Mean 15.0%, Range 1 – 43%
Herb Cover: Mean 7.1%, Range 1 – 23%

Surface Covers:
Large Rock: Mean 17.1%, Range 0 – 75%
Small Rock: Mean 57.8%, Range 6 – 93%
Fines: Mean 20.0%, Range 0 – 93%
Litter: Mean 3.3%, Range 0 – 24%

Conservation Status Rank: Global: G4; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA	Mojave	Mojave	Mojave	sGB

Section	322A	322A	322A	341F
Sample size		**4**	**54**	

Surveys Used in Description (N = 58): CAMO9106, MOJA0200, MOJA0289, MOJA0303, MOJA0438, MOJA0509, MOJA0691, MOJA9250, MOJA9374, MOJA9401, MOJA9412, MOJA9416, MOJA9433, MOJA9511, MOJA9539, MOJA9573, MOJA9624, MOJA9626, MOJA9633, MOJA9697, MOJA9805, MOJA9900, MOJA9916, MOJAE002, MOJAE004, MOJAE005, MOJAE006, MOJAE007, MOJAE076, MOJAE080, MOJAE082, MOJAE083, MOJAE089, MOJAE119, MOJAE152, MOJAE153, MOJAE197, MOJC0096, MOJC0192, MOJC0366, MOJC0834, MOJC0907, MOJC1153, MOJC1155, MOJC1226, MOJC1227, MOJD0107, MOJD0108, MOJDR111, MOJJE007, MOJJE016, MOJJE083, MOJJE098, MOJJE099, MOJJE221, MOJJE347, MOJJE543, MOJJE588

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Senegalia greggii	97	6.5	1.0	26.0	Y			Y
	Eriogonum fasciculatum	66	1.4	0.2	27.0				Y
	Hymenoclea salsola	64	4.2	0.2	40.0				Y
	Cylindropuntia acanthocarpa	59	0.8	0.1	8.0				Y
	Prunus fasciculata	52	2.0	0.2	13.0				Y
	Larrea tridentata	52	1.5	0.2	21.0				Y
	Salazaria mexicana	47	0.5	0.2	10.0				
	Thamnosma montana	43	0.2	0.2	4.0				
	Ephedra nevadensis	41	0.9	0.2	18.0				
	Phoradendron californicum	41	0.2	0.2	3.0				
	Yucca schidigera	40	0.2	0.2	1.5				
	Viguiera parishii	38	1.1	0.2	18.0				
	Stephanomeria pauciflora	36	0.1	0.2	2.1				
	Salvia dorrii	33	1.2	0.1	15.0				
	Ephedra viridis	31	0.3	0.2	3.5				
	Ambrosia eriocentra	29	2.2	0.2	45.0				
	Lotus rigidus	29	0.2	0.2	1.6				
	Echinocereus engelmannii	28	0.1	0.2	2.0				
	Ericameria linearifolia	26	0.3	0.2	6.0				
	Lycium andersonii	26	0.3	0.2	6.0				
	Ferocactus cylindraceus	26	0.2	0.2	2.0				
	Gutierrezia sarothrae	26	0.1	0.2	2.0				

	Krameria erecta	24	0.4	0.2	10.0				
	Ambrosia dumosa	22	0.4	0.0	14.0				
	Yucca baccata	22	0.2	0.2	2.0				
	Lycium cooperi	22	0.1	0.2	4.0				
	Gutierrezia microcephala	21	0.3	0.2	6.0				
	Salvia mohavensis	21	0.1	0.2	1.1				
Herb									
	Erodium cicutarium	72	1.1	0.2	6.0				Y
	Bromus rubens	69	2.1	0.2	15.0				Y
	Sphaeralcea ambigua	50	0.5	0.1	7.0				Y
	Achnatherum speciosum	40	0.6	0.2	14.0				
	Schismus	34	0.3	0.2	3.0				
	Mirabilis laevis	29	0.1	0.2	1.0				
	Amsinckia	28	0.1	0.2	3.0				
	Pleuraphis rigida	24	0.3	0.2	3.0				
	Eriogonum inflatum	24	0.1	0.2	1.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Hyptis emoryi Association

Common Name: Desert Lavender Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 451 m, Range 338 – 564 m
Slope: Mean 7°, Range 6 – 8°
Aspect: Southeast facing

Tree Cover: 0%
Shrub Cover: Mean 13.0%, Range 12 – 14%
Herb Cover: Mean 6.0%, Range 4 – 8%

Surface Covers:

Large Rock: Mean 16.6%, Range 3.2 – 30%
Small Rock: Mean 70.8%, Range 58 – 84%
Fines: Mean 5.0%, Range 0 – 10%
Litter: Mean 2.3%, Range 2 – 3%

Surveys Used in Description (N =2): MOJC0834, MOJD0108

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									

	Psorothamnus spinosus	100	0.4	0.2	0.5	Y	Y		Y
	Standing snag	50	0.5	1.0	1.0				Y
	Standing snag	50	0.5	1.0	1.0				Y
	Standing snag	50	0.5	1.0	1.0				Y
	Standing snag	50	0.5	1.0	1.0				Y
Shrub									
	Hyptis emoryi	100	6.0	5.0	7.0	Y		Y	Y
	Encelia farinosa	100	4.0	1.0	7.0	Y			Y
	Hymenoclea salsola	100	3.3	2.0	4.5	Y			Y
	Bebbia juncea	100	2.3	2.0	2.5	Y			Y
	Larrea tridentata	100	0.4	0.2	0.5	Y			Y
	Standing snag	50	0.5	1.0	1.0				Y
	Standing snag	50	0.5	1.0	1.0				Y
	Standing snag	50	0.5	1.0	1.0				Y
	Standing snag	50	0.5	1.0	1.0				Y
	Stephanomeria pauciflora	50	0.5	1.0	1.0				Y
	Ferocactus cylindraceus	50	0.3	0.5	0.5				Y
	Peucephyllum schottii	50	0.3	0.5	0.5				Y
	Opuntia basilaris	50	0.1	0.2	0.2				Y
Herb									
	Schismus	100	1.1	0.2	2.0	Y			Y
	Perityle emoryi	50	2.0	4.0	4.0				Y
	Cryptantha angustifolia	50	0.5	1.0	1.0				Y
	Monoptilon	50	0.5	1.0	1.0				Y
	Argythamnia	50	0.5	1.0	1.0				Y
	Chamaesyce polycarpa	50	0.3	0.5	0.5				Y
	Dasyochloa pulchella	50	0.3	0.5	0.5				Y
	Eriogonum inflatum	50	0.3	0.5	0.5				Y
	Physalis	50	0.3	0.5	0.5				Y
	Phacelia crenulata	50	0.1	0.2	0.2				Y
	Mimulus bigelovii	50	0.1	0.2	0.2				Y
	Nemacladus sigmoideus	50	0.1	0.2	0.2				Y
	Nama demissum	50	0.1	0.2	0.2				Y
	Mohavea confertiflora	50	0.1	0.2	0.2				Y
	Eriogonum thomasii	50	0.1	0.2	0.2				Y
	Chorizanthe brevicornu	50	0.1	0.2	0.2				Y
	Eschscholzia minutiflora	50	0.1	0.2	0.2				Y
	Linanthus jonesii	50	0.1	0.2	0.2				Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Senegalia greggii – (Bebbia juncea – Hyptis emoryi) Association

Common Name: Catclaw Acacia – (Sweetbush – Desert Lavender) Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 587 m, Range 447 – 726 m
Slope: Mean 3°, Range 2 – 4°
Aspect: Variable

Tree Cover: 1%
Shrub Cover: Mean 10.5%, Range 8 – 13%
Herb Cover: Mean 10.0%, Range 2 – 18%

Surface Covers:

Large Rock: Mean 3.7%, Range 2.4 – 5%
Small Rock: Mean 79.8%, Range 73 – 87%
Fines: Mean 15.0%, Range 10 – 20%
Litter: Mean 1.3%, Range 0 – 3%

Surveys Used in Description (N =2): MOJC0907, MOJD0107

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Psorothamnus spinosus	50	0.1	0.1	0.1				Y
Shrub									
	Hymenoclea salsola	100	3.8	2.0	5.5	Y			Y
	Bebbia juncea	100	2.8	1.5	4.0	Y			Y
	Senegalia greggii	100	2.5	2.0	3.0	Y			Y
	Larrea tridentata	100	1.1	0.2	2.0	Y			Y
	Encelia farinosa	100	1.1	0.2	2.0	Y			Y
	Hyptis emoryi	50	1.8	3.5	3.5				Y
	Phoradendron californicum	50	0.5	1.0	1.0				Y
	Opuntia	50	0.3	0.5	0.5				Y
	Ferocactus cylindraceus	50	0.3	0.5	0.5				Y
	Tidestromia	50	0.3	0.5	0.5				Y
	Lycium	50	0.3	0.5	0.5				Y
	Pleurocoronis pluriseta	50	0.1	0.2	0.2				Y
Herb									
	Chorizanthe brevicornu	100	1.3	0.5	2.0	Y			Y
	Eriogonum inflatum	100	0.8	0.5	1.0	Y			Y
	Perityle emoryi	50	3.0	6.0	6.0				Y

	Eriogonum thomasii	50	3.0	6.0	6.0	Y
	Atrichoseris platyphylla	50	0.5	1.0	1.0	Y
	Chamaesyce setiloba	50	0.5	1.0	1.0	Y
	Chaenactis carphoclinia	50	0.5	1.0	1.0	Y
	Funastrum hirtellum	50	0.3	0.5	0.5	Y
	Physalis crassifolia	50	0.3	0.5	0.5	Y
	Chaenactis	50	0.3	0.5	0.5	Y
	Aristida adscensionis	50	0.3	0.5	0.5	Y
	Mohavea breviflora	50	0.3	0.5	0.5	Y
	Lotus strigosus	50	0.3	0.5	0.5	Y
	Eschscholzia minutiflora	50	0.3	0.5	0.5	Y
	Camissonia boothii	50	0.3	0.5	0.5	Y
	Cryptantha	50	0.3	0.5	0.5	Y
	Chamaesyce	50	0.3	0.5	0.5	Y
	Schismus	50	0.1	0.2	0.2	Y
	Calycoseris	50	0.1	0.2	0.2	Y
	Phacelia crenulata	50	0.1	0.2	0.2	Y
	Eriogonum reniforme	50	0.1	0.2	0.2	Y
	Eschscholzia parishii	50	0.1	0.2	0.2	Y
	Camissonia brevipes	50	0.1	0.2	0.2	Y
	Monoptilon	50	0.1	0.2	0.2	Y
	Mohavea confertiflora	50	0.1	0.2	0.2	Y
	Camissonia claviformis	50	0.1	0.2	0.2	Y
	Salvia columbariae	50	0.1	0.2	0.2	Y
Non-vascular						
	Cryptogammic crust	50	0.5	1.0	1.0	Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Senegalia greggii – Ambrosia salsola Association

Common Name: Catclaw Acacia - Cheesebush Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 977 m, Range 633 – 1229 m
Slope: Mean 2°, Range 0 – 4°
Aspect: Variable

Tree Cover: Mean 2.7%, Range 0 – 6%
Shrub Cover: Mean 13.0%, Range 1 – 28%
Herb Cover: Mean 5.8%, Range 1 – 16%

Surface Covers:

Large Rock: Mean 1.3%, Range 0 – 7%
Small Rock: Mean 62.0%, Range 30 – 90%
Fines: Mean 34.8%, Range 0 – 67%
Litter: Mean 3.1%, Range 0 – 11%

Surveys Used in Description (N =17): MOJA0200, MOJA0303, MOJA9374, MOJA9401, MOJA9633, MOJA9805, MOJA9916, MOJAE152, MOJAE153, MOJC0096, MOJC0366, MOJC1226, MOJC1227, MOJDR111, MOJJE007, MOJJE347, MOJJE588

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Hymenoclea salsola	100	8.7	1.0	40.0	Y			Y
	Senegalia greggii	100	6.5	1.0	26.0	Y			Y
	Larrea tridentata	82	3.7	0.2	21.0	Y			Y
	Ambrosia dumosa	59	1.3	0.0	14.0				Y
	Eriogonum fasciculatum	59	0.6	0.2	4.0				Y
	Salazaria mexicana	59	0.2	0.2	1.0				Y
	Ambrosia eriocentra	47	0.7	0.2	7.0				
	Lycium cooperi	41	0.3	0.2	4.0				
	Cylindropuntia acanthocarpa	41	0.2	0.1	1.5				
	Thamnosma montana	41	0.1	0.2	0.5				
	Lycium andersonii	35	0.6	0.2	6.0				
	Salvia dorrii	35	0.4	0.1	4.0				
	Krameria grayi	35	0.3	0.2	3.5				
	Cylindropuntia ramosissima	35	0.3	0.2	2.0				
	Phoradendron	35	0.1	0.2	0.5				

	californicum							
	Yucca schidigera	35	0.1	0.2	0.5			
	Ephedra nevadensis	35	0.1	0.2	1.0			
	Senna armata	29	1.4	0.2	15.0			
	Viguiera parishii	29	0.1	0.2	1.0			
	Krameria erecta	24	0.8	0.2	10.0			
	Acamptopappus sphaerocephalus	24	0.6	1.5	5.0			
	Ericameria paniculata	24	0.6	0.2	9.0			
	Tetradymia stenolepis	24	0.2	0.2	3.0			
	Ericameria cooperi	24	0.2	0.2	2.0			
Herb								
	Erodium cicutarium	76	1.0	0.2	5.0	Y		Y
	Bromus rubens	59	1.3	0.2	12.0			Y
	Schismus	53	0.3	0.2	2.0			Y
	Pleuraphis rigida	24	0.4	0.5	3.0			
	Amsinckia	24	0.1	0.2	1.5			
	Sphaeralcea ambigua	24	0.1	0.1	0.5			
	Adenophyllum cooperi	24	0.0	0.1	0.2			
Shrub								
	Hymenoclea salsola	100	8.7	1.0	40.0	Y		Y
	Senegalia greggii	100	6.5	1.0	26.0	Y		Y
	Larrea tridentata	82	3.7	0.2	21.0	Y		Y
	Ambrosia dumosa	59	1.3	0.0	14.0			Y
	Eriogonum fasciculatum	59	0.6	0.2	4.0			Y
	Salazaria mexicana	59	0.2	0.2	1.0			Y
	Ambrosia eriocentra	47	0.7	0.2	7.0			
	Lycium cooperi	41	0.3	0.2	4.0			
	Cylindropuntia acanthocarpa	41	0.2	0.1	1.5			
	Thamnosma montana	41	0.1	0.2	0.5			
	Lycium andersonii	35	0.6	0.2	6.0			

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Suaeda moquinii Shrubland Alliance

Common Name: Bush seepweed scrub

NVC Alliance Code: A3880. *Suaeda moquinii - Salicornia rubra - Isocoma acradenia* Alkaline Wet Scrub Alliance

Associations	Sample Size	NVC Code
Isocoma acradenia Alkaline Wet	2	CEGL005465
Suaeda moquinii	19	CEGL001991

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 410 m, Range 283 – 583 m
Slope: Mean 1°, Range 0 – 2°
Aspect: Mostly flat

Tree Cover: 0%
Shrub Cover: Mean 10.2%, Range 0 – 31%
Herb Cover: Mean 7.3%, Range 0 – 32%

Surface Covers:

Large Rock: Mean 0.0%, Range 0 – 1%
Small Rock: Mean 12.0%, Range 0 – 84%
Fines: Mean 69.3%, Range 0 – 100%
Litter: Mean 3.0%, Range 0 – 15%

Conservation Status Rank: Global: G4; **State (California):** S3

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**6**		**15**	

Surveys Used in Description (N = 21): DEVA9422, DEVAS020, MOJA0194, MOJA0554, MOJA0637, MOJA0644, MOJA9187, MOJA9647, MOJA9648, MOJA9652, MOJC0024, MOJC0724, MOJC0852, MOJC0954, MOJD0022, MOJD0023, MOJD0025, MOJD0026, MOJDR002, MOJDR008, SLTN0532

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Suaeda moquinii	100	9.6	0.2	63.0	Y	Y		Y
	Atriplex polycarpa	43	0.5	0.0	3.0				
	Atriplex confertifolia	24	0.5	0.2	5.0				
	Atriplex hymenelytra	24	0.3	0.2	3.0				
Herb									
	Schismus	71	2.2	0.2	7.0				Y
	Forb (herbaceous, not grass nor grasslike)	29	0.1	0.1	0.2				
	Cryptantha	24	0.1	0.0	1.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Suaeda moquinii Association

Common Name: Great Valley Bush Seepweed Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 423 m, Range 283 – 583 m
Slope: Mean 1°, Range 0 – 2°
Aspect: Mostly flat

Tree Cover: 0%
Shrub Cover: Mean 10.3%, Range 0 – 31%
Herb Cover: Mean 6.9%, Range 0 – 32%

Surface Covers:

Large Rock: Mean 0.0%, Range 0 – 1%
Small Rock: Mean 13.0%, Range 0 – 84%
Fines: Mean 66.4%, Range 0 – 100%
Litter: Mean 3.1%, Range 0 – 15%

Surveys Used in Description (N =19): DEVA9422, DEVAS020, MOJA0194, MOJA0554, MOJA0637, MOJA0644, MOJA9648, MOJA9652, MOJC0024, MOJC0724, MOJC0852, MOJC0954, MOJD0022, MOJD0023, MOJD0025, MOJD0026, MOJDR002, MOJDR008, SLTN0532

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Suaeda moquinii	100	10.5	0.2	63.0	Y	Y		Y
	Atriplex polycarpa	42	0.5	0.0	3.0				
	Atriplex confertifolia	26	0.6	0.2	5.0				
	Atriplex hymenelytra	26	0.3	0.2	3.0				
	Standing snag	21	0.9	4.0	7.0				
Herb									
	Schismus	68	1.9	0.2	7.0				Y
	Forb (herbaceous, not grass nor grasslike)	26	0.0	0.1	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Suaeda moquinii Association

Tamarix spp. Shrubland Alliance

Common Name: Tamarisk thickets

NVC Alliance Code: A0842. *Tamarix* spp. Ruderal Riparian Scrub Alliance

Associations	Sample Size	NVC Code
Tamarix spp.	1	CEGL003114

Classification Comments: The association circumscription is the same as that of the alliance.

Plot/Sample Data Summary:

Elevation: 1239 m
Slope: 3°
Aspect: Northwest-facing

Tree Cover: 7%
Shrub Cover: 0%
Herb Cover: 5%

Surface Covers:

Large Rock: 0%
Small Rock: 3%
Fines: 81%
Litter: 16%

Conservation Status Rank: Global: GNA; **State (California):** SNA

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**1**	

Surveys Used in Description (N = 1): MOJA9314

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Tamarix ramosissima	100	7.0	7.0	7.0	Y	Y		Y
	Gutierrezia microcephala	100	0.2	0.2	0.2	Y			Y
	Ephedra nevadensis	100	0.2	0.2	0.2	Y			Y
	Senegalia greggii	100	0.1	0.1	0.1	Y			Y

	Larrea tridentata	100	0.1	0.1	0.1	Y		Y
	Hymenoclea salsola	100	0.1	0.1	0.1	Y		Y
	Eriogonum fasciculatum	100	0.1	0.1	0.1	Y		Y
	Lycium cooperi	100	0.1	0.1	0.1	Y		Y
	Stephanomeria pauciflora	100	0.1	0.1	0.1	Y		Y
	Psilostrophe cooperi	100	0.1	0.1	0.1	Y		Y
	Atriplex canescens	100	0.1	0.1	0.1	Y		Y
Herb								
	Salsola	100	3.0	3.0	3.0	Y	Y	Y
	Eriogonum deflexum	100	0.5	0.5	0.5	Y		Y
	Descurainia sophia	100	0.5	0.5	0.5	Y		Y
	Schismus	100	0.2	0.2	0.2	Y		Y
	Baileya multiradiata	100	0.2	0.2	0.2	Y		Y
	Achnatherum hymenoides	100	0.2	0.2	0.2	Y		Y
	Dasyochloa pulchella	100	0.2	0.2	0.2	Y		Y
	Bromus tectorum	100	0.2	0.2	0.2	Y		Y
	Bromus rubens	100	0.2	0.2	0.2	Y		Y
	Forb (herbaceous, not grass nor grasslike)	100	0.1	0.1	0.1	Y		Y
	Descurainia pinnata	100	0.1	0.1	0.1	Y		Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Yucca schidigera Shrubland Alliance

Common Name: Mojave yucca scrub

NVC Alliance Code: A3147. *Yucca schidigera* Scrub Alliance

Associations	Sample Size	NVC Code
Yucca schidigera – Coleogyne ramosissima	8	CEGL005780
Yucca schidigera – Cylindropuntia acanthocarpa	15	CEGL005783
Yucca schidigera – Eriogonum fasciculatum	25	CEGL005781
Yucca schidigera – Larrea tridentata – Ambrosia dumosa	11	CEGL005295
Yucca schidigera – Larrea tridentata – Ephedra nevadensis	5	CEGL005782
Yucca schidigera / Pleuraphis rigida	1	n/a

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 1203 m, Range 884 – 1547 m
Slope: Mean 11°, Range 1 – 35°
Aspect: Variable

Tree Cover: Mean 3.2%, Range 0 – 11%
Shrub Cover: Mean 14.9%, Range 1 – 24%
Herb Cover: Mean 8.3%, Range 1 – 22%

Surface Covers:

Large Rock: Mean 9.7%, Range 0 – 75%
Small Rock: Mean 67.0%, Range 0 – 95%
Fines: Mean 11.1%, Range 0 – 50%
Litter: Mean 3.3%, Range 0 – 20%

Conservation Status Rank: Global: G4; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size		**1**	**64**	

Surveys Used in Description (N = 65): CAMO9104, CAMO9105, CAMO9107,

CAMO9131, CAMO9133, MOJA0251, MOJA9125, MOJA9252, MOJA9254, MOJA9255, MOJA9313, MOJA9315, MOJA9373, MOJA9415, MOJA9419, MOJA9420, MOJA9422, MOJA9429, MOJA9437, MOJA9457, MOJA9460, MOJA9461, MOJA9500, MOJA9531, MOJA9532, MOJA9533, MOJA9534, MOJA9536, MOJA9537, MOJA9538, MOJA9565, MOJA9568, MOJA9569, MOJA9576, MOJA9582, MOJA9585, MOJA9586, MOJA9592, MOJA9622, MOJA9623, MOJA9625, MOJA9632, MOJA9634, MOJA9668, MOJA9687, MOJA9903, MOJA9904, MOJA9905, MOJA9918, MOJC0011, MOJC0094, MOJC0097, MOJC0098, MOJC0189, MOJC0191, MOJC0197, MOJC0211, MOJC0294, MOJC0353, MOJC0354, MOJC1067, MOJC1081, MOJC1136, MOJC1154, MOJC1231

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Yucca schidigera	100	3.3	1.0	11.0	Y			Y
	Cylindropuntia acanthocarpa	86	1.7	0.2	12.5	Y			Y
	Eriogonum fasciculatum	80	1.8	0.2	9.0	Y			Y
	Ephedra nevadensis	77	0.7	0.2	4.0	Y			Y
	Larrea tridentata	72	1.3	0.2	8.0				Y
	Echinocereus engelmannii	71	0.3	0.2	2.0				Y
	Ferocactus cylindraceus	66	0.7	0.2	5.0				Y
	Senegalia greggii	65	0.5	0.2	4.0				Y
	Krameria erecta	57	0.3	0.2	1.5				Y
	Viguiera parishii	52	0.6	0.2	6.0				Y
	Thamnosma montana	51	0.3	0.2	2.0				Y
	Salazaria mexicana	40	0.3	0.2	4.0				
	Coleogyne ramosissima	38	0.9	0.2	11.0				
	Ericameria cooperi	38	0.5	0.2	8.0				
	Ambrosia dumosa	37	0.9	0.2	9.0				
	Krameria grayi	37	0.3	0.2	2.0				
	Gutierrezia sarothrae	35	0.4	0.2	8.0				
	Stephanomeria pauciflora	34	0.1	0.2	1.0				
	Lycium andersonii	32	0.2	0.2	3.0				
	Psilostrophe cooperi	28	0.2	0.2	5.0				
	Opuntia basilaris	28	0.1	0.2	0.5				
	Hymenoclea salsola	26	0.2	0.2	4.0				
	Encelia virginensis	25	0.1	0.2	1.0				
	Tetradymia stenolepis	23	0.1	0.2	2.0				
	Salvia mohavensis	20	0.1	0.2	1.0				
Herb									
	Bromus rubens	92	2.8	0.2	18.0	Y			Y

	Erodium cicutarium	82	1.5	0.2	12.0	Y		Y
	Sphaeralcea ambigua	62	0.2	0.2	1.0			Y
	Eriogonum inflatum	54	0.2	0.2	3.0			Y
	Pleuraphis rigida	49	1.2	0.2	12.0			
	Achnatherum speciosum	40	0.2	0.2	3.0			
	Xylorhiza tortifolia	40	0.2	0.2	1.5			
	Mirabilis laevis	35	0.1	0.2	0.5			
	Amsinckia	35	0.1	0.2	1.0			
	Schismus	28	0.2	0.2	2.0			
	Dasyochloa pulchella	26	0.1	0.2	1.0			
	Muhlenbergia porteri	25	0.1	0.2	1.0			
	Porophyllum gracile	22	0.1	0.1	0.5			
Non-vascular								
	Lichen	49	0.3	0.2	5.0			
	Cryptogammic crust	23	0.1	0.2	2.0			

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Yucca schidigera – Coleogyne ramosissima Association

Common Name: Mojave Yucca - Blackbush Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1271 m, Range 1046 – 1547 m
Slope: Mean 14°, Range 3 – 32°
Aspect: Variable

Tree Cover: Mean 3.0%, Range 3 – 3%
Shrub Cover: Mean 14.8%, Range 8 – 20%
Herb Cover: Mean 6.3%, Range 2 – 14%

Surface Covers:

Large Rock: Mean 16.3%, Range 0.2 – 75%
Small Rock: Mean 65.5%, Range 20 – 90%
Fines: Mean 12.3%, Range 1 – 40%
Litter: Mean 2.2%, Range 0 – 6%

Surveys Used in Description (N =8): MOJA9415, MOJA9422, MOJA9429, MOJA9668, MOJA9905, MOJC0353, MOJC0354, MOJC1136

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Coleogyne ramosissima	100	5.5	2.0	11.0	Y			Y
	Yucca schidigera	100	3.3	2.0	5.5	Y			Y
	Cylindropuntia acanthocarpa	88	1.2	0.2	3.0	Y			Y
	Ephedra nevadensis	75	0.8	0.2	2.5	Y			Y
	Larrea tridentata	75	0.6	0.2	2.5	Y			Y
	Echinocereus engelmannii	75	0.4	0.2	1.0	Y			Y
	Krameria erecta	75	0.3	0.2	1.0	Y			Y
	Viguiera parishii	63	0.8	0.2	2.0				Y
	Salazaria mexicana	63	0.7	0.2	4.0				Y
	Thamnosma montana	63	0.3	0.2	0.5				Y
	Eriogonum fasciculatum	50	0.7	0.2	3.0				Y
	Ferocactus cylindraceus	50	0.3	0.2	1.5				Y
	Ericameria cooperi	50	0.2	0.2	0.5				Y
	Opuntia basilaris	50	0.2	0.2	0.5				Y
	Gutierrezia sarothrae	50	0.1	0.2	0.5				Y
	Krascheninnikovia lanata	38	0.6	1.0	2.0				

	Ephedra viridis	38	0.3	0.2	1.0				
	Lycium andersonii	38	0.2	0.5	0.5				
	Tetradymia stenolepis	38	0.2	0.2	1.0				
	Senegalia greggii	38	0.2	0.2	1.0				
	Eriogonum heermannii	38	0.2	0.2	1.0				
	Psilostrophe cooperi	38	0.2	0.2	0.5				
	Salvia dorrii	38	0.1	0.2	0.5				
	Salvia mohavensis	38	0.1	0.2	0.5				
	Hymenoclea salsola	25	0.5	0.2	4.0				
	Cylindropuntia ramosissima	25	0.3	0.2	2.0				
	Opuntia chlorotica	25	0.1	0.5	0.5				
	Brickellia arguta	25	0.1	0.2	0.5				
	Artemisia tridentata	25	0.1	0.2	0.5				
	Ambrosia dumosa	25	0.1	0.2	0.5				
	Psorothamnus fremontii	25	0.1	0.2	0.2				
	Stephanomeria pauciflora	25	0.1	0.2	0.2				
	Agave deserti	25	0.1	0.2	0.2				
Herb									
	Bromus rubens	88	3.5	0.2	10.0	Y		Y	Y
	Erodium cicutarium	75	0.6	0.2	2.0	Y			Y
	Sphaeralcea ambigua	63	0.2	0.2	0.5				Y
	Achnatherum speciosum	50	0.2	0.2	0.5				Y
	Eriogonum inflatum	50	0.2	0.2	0.5				Y
	Xylorhiza tortifolia	38	0.3	0.2	1.5				
	Arenaria macradenia	38	0.2	0.2	0.5				
	Pleuraphis rigida	38	0.1	0.2	0.5				
	Mirabilis laevis	38	0.1	0.2	0.5				
	Schismus	25	0.1	0.5	0.5				
	Cheilanthes parryi	25	0.1	0.5	0.5				
	Dasyochloa pulchella	25	0.1	0.2	0.5				
	Aristida purpurea	25	0.1	0.2	0.5				
	Stanleya pinnata	25	0.1	0.2	0.5				
	Castilleja angustifolia	25	0.1	0.2	0.5				
	Antheropeas	25	0.1	0.2	0.2				
	Plagiobothrys	25	0.1	0.2	0.2				
	Amsinckia	25	0.1	0.2	0.2				
	Calochortus	25	0.1	0.2	0.2				
	Dudleya saxosa	25	0.1	0.2	0.2				
Non-vascular									
	Cryptogammic crust	63	0.4	0.2	2.0				Y
	Lichen	38	0.1	0.2	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max

= Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Yucca schidigera – Cylindropuntia acanthocarpa Association

Common Name: Mojave Yucca - Buckhorn Cholla Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1182 m, Range 884 – 1413 m
Slope: Mean 13°, Range 2 – 35°
Aspect: Variable

Tree Cover: Mean 1.5%, Range 1 – 2%
Shrub Cover: Mean 15.7%, Range 8 – 24%
Herb Cover: Mean 9.7%, Range 2 – 22%

Surface Covers:

Large Rock: Mean 10.4%, Range 0 – 40%
Small Rock: Mean 65.8%, Range 5 – 92%
Fines: Mean 5.6%, Range 1 – 26%
Litter: Mean 3.7%, Range 1 – 10%

Surveys Used in Description (N =15): MOJA0251, MOJA9125, MOJA9252, MOJA9373, MOJA9419, MOJA9420, MOJA9457, MOJA9461, MOJA9568, MOJA9576, MOJA9582, MOJA9585, MOJA9622, MOJA9632, MOJA9904

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Yucca schidigera	100	3.2	1.0	5.0	Y			Y
	Cylindropuntia acanthocarpa	100	2.5	1.0	5.0	Y			Y
	Ferocactus cylindraceus	93	1.2	0.2	3.0	Y			Y
	Echinocereus engelmannii	93	0.4	0.2	1.0	Y			Y
	Eriogonum fasciculatum	87	1.0	0.2	3.0	Y			Y
	Viguiera parishii	87	0.9	0.2	6.0	Y			Y
	Senegalia greggii	80	0.5	0.2	2.0	Y			Y
	Ephedra nevadensis	80	0.4	0.2	1.0	Y			Y
	Thamnosma montana	73	0.2	0.2	1.0				Y
	Gutierrezia sarothrae	60	0.3	0.2	1.0				Y
	Krameria erecta	60	0.2	0.2	0.5				Y
	Coleogyne ramosissima	53	0.7	0.2	3.0				Y
	Larrea tridentata	53	0.7	0.2	5.0				Y
	Krameria grayi	33	0.2	0.2	1.0				
	Phoradendron	33	0.1	0.2	0.5				

	californicum							
	Ericameria laricifolia	33	0.1	0.2	0.5			
	Opuntia basilaris	33	0.1	0.2	0.2			
	Ericameria linearifolia	33	0.1	0.2	0.2			
	Encelia farinosa	27	0.5	0.2	5.0			
	Menodora scabra	27	0.3	0.1	4.0			
	Prunus fasciculata	27	0.1	0.2	1.0			
	Salvia mohavensis	27	0.1	0.2	1.0			
	Salazaria mexicana	27	0.1	0.2	0.5			
	Ambrosia dumosa	27	0.1	0.2	0.2			
	Hymenoclea salsola	20	0.2	0.2	2.0			
	Encelia virginensis	20	0.1	0.2	1.0			
	Stephanomeria pauciflora	20	0.1	0.2	1.0			
	Cylindropuntia ramosissima	20	0.0	0.2	0.2			
	Opuntia polyacantha var. erinacea	20	0.0	0.2	0.2			
	Opuntia chlorotica	20	0.0	0.2	0.2			
	Galium stellatum	20	0.0	0.2	0.2			
Herb								
	Bromus rubens	100	5.0	0.2	18.0	Y	Y	Y
	Erodium cicutarium	73	1.2	0.2	5.0			Y
	Pleuraphis rigida	60	1.7	0.2	9.0			Y
	Sphaeralcea ambigua	60	0.1	0.2	0.5			Y
	Eriogonum inflatum	47	0.1	0.2	0.5			
	Salvia columbariae	40	0.1	0.1	0.2			
	Aristida purpurea	33	0.2	0.2	1.0			
	Achnatherum speciosum	33	0.1	0.2	0.5			
	Chorizanthe brevicornu	33	0.1	0.2	0.2			
	Mirabilis laevis	33	0.1	0.2	0.2			
	Amsinckia	27	0.1	0.2	0.5			
	Dasyochloa pulchella	27	0.1	0.2	0.2			
	Astragalus nuttallianus	27	0.1	0.2	0.2			
	Cryptantha pterocarya	20	0.0	0.2	0.2			
	Cryptantha	20	0.0	0.2	0.2			
	Lepidium lasiocarpum	20	0.0	0.2	0.2			
	Schismus	20	0.0	0.2	0.2			
	Porophyllum gracile	20	0.0	0.1	0.2			
Non-vascular								
	Lichen	67	0.1	0.2	0.2			Y
	Cryptogammic crust	47	0.2	0.2	1.0			
	Moss	27	0.2	0.2	2.0			

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max

= Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Yucca schidigera – Larrea tridentata – Ambrosia dumosa Association

Common Name: Mojave Yucca - Creosote Bush - White Bursage Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1087 m, Range 929 – 1351 m
Slope: Mean 6°, Range 1 – 18°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 13.9%, Range 1 – 18%
Herb Cover: Mean 7.9%, Range 1 – 15%

Surface Covers:

Large Rock: Mean 2.4%, Range 0 – 10%
Small Rock: Mean 80.9%, Range 49 – 93%
Fines: Mean 13.8%, Range 3 – 45%
Litter: Mean 1.7%, Range 0 – 3%

Surveys Used in Description (N =11): MOJA9531, MOJA9534, MOJA9536, MOJA9537, MOJA9565, MOJA9569, MOJA9586, MOJA9625, MOJC0011, MOJC0197, MOJC1231

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	100	3.5	1.5	8.0	Y			Y
	Yucca schidigera	100	2.3	1.0	4.0	Y			Y
	Ambrosia dumosa	82	4.4	0.5	9.0	Y			Y
	Cylindropuntia acanthocarpa	82	1.2	0.2	10.5	Y			Y
	Ferocactus cylindraceus	73	0.4	0.2	1.5				Y
	Echinocereus engelmannii	73	0.2	0.2	0.5				Y
	Eriogonum fasciculatum	64	0.8	0.2	5.0				Y
	Krameria grayi	64	0.5	0.2	2.0				Y
	Thamnosma montana	55	0.6	0.2	2.0				Y
	Ephedra nevadensis	55	0.2	0.2	0.5				Y
	Senegalia greggii	45	0.3	0.2	2.0				
	Krameria erecta	36	0.3	0.5	1.5				
	Viguiera parishii	36	0.2	0.2	1.0				
	Acamptopappus sphaerocephalus	36	0.2	0.2	1.0				
	Grayia spinosa	36	0.1	0.2	0.5				
	Ericameria cooperi	36	0.1	0.2	0.5				

	Senna armata	27	0.6	0.5	3.0				
	Psilostrophe cooperi	27	0.1	0.2	1.0				
	Lycium andersonii	27	0.1	0.2	0.5				
	Krascheninnikovia lanata	27	0.1	0.2	0.5				
	Stephanomeria pauciflora	27	0.1	0.2	0.5				
	Opuntia basilaris	27	0.1	0.2	0.5				
Herb									
	Erodium cicutarium	91	4.1	0.5	12.0	Y		Y	Y
	Bromus rubens	82	1.4	0.2	4.0	Y			Y
	Eriogonum inflatum	73	0.2	0.2	0.5				Y
	Amsinckia	64	0.1	0.2	0.2				Y
	Xylorhiza tortifolia	55	0.3	0.2	1.0				Y
	Schismus	45	0.3	0.2	2.0				
	Sphaeralcea ambigua	45	0.1	0.2	0.5				
	Dasyochloa pulchella	45	0.1	0.2	0.5				
	Cryptantha	36	0.1	0.2	0.2				
	Muhlenbergia porteri	27	0.1	0.2	1.0				
	Mirabilis laevis	27	0.1	0.2	0.5				
	Brassicaceae	27	0.1	0.2	0.5				
	Pleuraphis rigida	27	0.1	0.2	0.5				
Non-vascular									
	Lichen	27	0.1	0.2	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Yucca schidigera – Larrea tridentata – Ephedra nevadensis Association

Common Name: Mojave Yucca - Creosote Bush - Nevada Ephedra Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1239 m, Range 1102 – 1368 m
Slope: Mean 6°, Range 2 – 8°
Aspect: Variable

Tree Cover: Mean 3.7%, Range 0 – 11%
Shrub Cover: Mean 9.6%, Range 2 – 16%
Herb Cover: Mean 7.3%, Range 3 – 10%

Surface Covers:

Large Rock: Mean 3.7%, Range 0.2 – 10%
Small Rock: Mean 66.9%, Range 58 – 73%
Fines: Mean 24.9%, Range 18 – 38%
Litter: Mean 3.1%, Range 0 – 8%

Surveys Used in Description (N =5): CAMO9104, CAMO9131, CAMO9133, MOJC0294, MOJC1081

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Yucca brevifolia	60	0.2	0.2	0.5				Y
Shrub									
	Yucca schidigera	100	4.1	2.0	6.5	Y			Y
	Larrea tridentata	100	2.9	1.0	6.0	Y			Y
	Lycium andersonii	100	1.4	0.5	3.0	Y			Y
	Ephedra nevadensis	80	1.4	0.2	4.0	Y			Y
	Salazaria mexicana	60	0.7	0.2	2.5				Y
	Krascheninnikovia lanata	60	0.6	0.5	2.0				Y
	Ambrosia dumosa	60	0.3	0.2	1.0				Y
	Ericameria cooperi	60	0.3	0.2	1.0				Y
	Krameria grayi	40	0.6	1.0	2.0				
	Cylindropuntia acanthocarpa	40	0.3	0.2	1.5				
	Eriogonum fasciculatum	40	0.3	0.5	1.0				
	Hymenoclea salsola	40	0.1	0.2	0.5				
	Krameria erecta	40	0.1	0.2	0.5				
	Acamptopappus sphaerocephalus	40	0.1	0.2	0.5				

	Ferocactus cylindraceus	40	0.1	0.2	0.2		
	Psilostrophe cooperi	40	0.1	0.2	0.2		
	Senna armata	20	0.3	1.5	1.5		
	Cylindropuntia ramosissima	20	0.3	1.5	1.5		
	Gutierrezia microcephala	20	0.2	1.0	1.0		
	Acamptopappus shockleyi	20	0.2	1.0	1.0		
	Stephanomeria pauciflora	20	0.1	0.5	0.5		
	Thamnosma montana	20	0.1	0.5	0.5		
	Tetradymia	20	0.1	0.5	0.5		
	Psorothamnus fremontii	20	0.1	0.5	0.5		
	Cylindropuntia echinocarpa	20	0.1	0.5	0.5		
	Ephedra viridis	20	0.1	0.5	0.5		
	Lycium cooperi	20	0.1	0.5	0.5		
	Psorothamnus arborescens	20	0.1	0.5	0.5		
	Senegalia greggii	20	0.0	0.2	0.2		
	Amphipappus fremontii	20	0.0	0.2	0.2		
	Tiquilia canescens	20	0.0	0.2	0.2		
	Coleogyne ramosissima	20	0.0	0.2	0.2		
	Encelia virginensis	20	0.0	0.2	0.2		
	Opuntia polyacantha var. erinacea	20	0.0	0.2	0.2		
	Opuntia basilaris	20	0.0	0.2	0.2		
Herb							
	Erodium cicutarium	100	1.0	0.2	2.0	Y	Y
	Bromus rubens	80	0.3	0.2	0.5	Y	Y
	Pleuraphis jamesii	60	2.6	2.0	6.0		Y
	Mirabilis laevis	60	0.2	0.2	0.5		Y
	Sphaeralcea ambigua	60	0.2	0.2	0.5		Y
	Muhlenbergia porteri	60	0.2	0.2	0.5		Y
	Achnatherum speciosum	40	0.4	1.0	1.0		
	Dasyochloa pulchella	40	0.2	0.2	1.0		
	Xylorhiza tortifolia	40	0.2	0.5	0.5		
	Pleuraphis rigida	40	0.2	0.5	0.5		
	Eriogonum inflatum	40	0.1	0.2	0.5		
	Schismus	20	0.4	2.0	2.0		
	Bouteloua barbata	20	0.2	1.0	1.0		
	Bouteloua curtipendula	20	0.2	1.0	1.0		
	Phacelia anelsonii	20	0.1	0.5	0.5		
	Adenophyllum cooperi	20	0.1	0.5	0.5		
	Aristida purpurea	20	0.1	0.5	0.5		
	Astragalus	20	0.1	0.5	0.5		
	Sporobolus contractus	20	0.1	0.5	0.5		
	Chorizanthe brevicornu	20	0.1	0.5	0.5		

	Chamaesyce albomarginata	20	0.0	0.2	0.2	
	Astragalus nuttallianus	20	0.0	0.2	0.2	
	Lesquerella tenella	20	0.0	0.2	0.2	
	Brassicaceae	20	0.0	0.2	0.2	
	Chaenactis	20	0.0	0.2	0.2	
	Porophyllum gracile	20	0.0	0.2	0.2	
	Antheropeas	20	0.0	0.2	0.2	
	Chaenactis stevioides	20	0.0	0.2	0.2	
	Malacothrix coulteri	20	0.0	0.2	0.2	
	Hoffmannseggia glauca	20	0.0	0.2	0.2	
	Langloisia setosissima	20	0.0	0.2	0.2	
	Mentzelia albicaulis	20	0.0	0.2	0.2	
	Phacelia crenulata	20	0.0	0.2	0.2	
	Mirabilis	20	0.0	0.2	0.2	
	Adenophyllum porophylloides	20	0.0	0.2	0.2	
	Stephanomeria exigua	20	0.0	0.2	0.2	
	Mentzelia	20	0.0	0.2	0.2	
	Quincula lobata	20	0.0	0.1	0.1	
Non-vascular						
	Lichen	60	2.2	2.0	5.0	Y

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

HERBACEOUS VEGETATION

Distichlis spicata Herbaceous Alliance

Common Name: Salt grass flats

NVC Alliance Code: A1332. *Distichlis spicata* Alkaline Wet Meadow Alliance

Associations	Sample Size	NVC Code
Distichlis spicata	3	CEGL001770
Distichlis spicata – Juncus arcticus var. *balticus (J. arcticus* var. *mexicanus)*	1	CEPP006700
Juncus cooperi	3	CEPP006712

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 289 m, Range 283 – 319 m
Slope: Mean 1°, Range 0 – 1°
Aspect: Mostly flat

Tree Cover: Mean 1.3%, Range 1 – 2%
Shrub Cover: Mean 0.5%, Range 0 – 2%
Herb Cover: Mean 47.3%, Range 10 – 86%

Surface Covers:

Large Rock: 0%
Small Rock: Mean 3.0%, Range 0 – 10%
Fines: Mean 78.5%, Range 25 – 100%
Litter: Mean 12.1%, Range 0 – 70%

Conservation Status Rank: Global: GNR; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**1**		**6**	

Surveys Used in Description (N = 7): MOJA9185, MOJA9186, MOJA9198, MOJA9550, MOJA9552, MOJC0853, MOJD0010

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Washingtonia filifera	29	0.3	1.0	1.0				
Shrub									
	Isocoma acradenia	43	0.2	0.2	1.0				
	Suaeda moquinii	43	0.2	0.2	1.0				
	Tamarix ramosissima	29	0.3	1.0	1.0				
	Atriplex hymenelytra	29	0.1	0.2	0.2				
Herb									
	Distichlis spicata	100	16.1	0.5	25.0	Y	Y		Y
	Juncus cooperi	57	17.6	3.0	45.0				Y
	Typha	43	2.7	0.5	18.0				
	Juncus arcticus	29	3.3	8.0	15.0				
	Phragmites australis	29	0.7	2.0	3.0				
	Schismus	29	0.1	0.2	0.2				
	Atriplex phyllostegia	29	0.1	0.2	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Juncus cooperi Provisional Association

Common Name: Cooper's Rush Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 295 m, Range 283 – 319 m
Slope: Mean 1°, Range 1 – 1°
Aspect: Mostly south-facing

Tree Cover: Mean 1.0%, Range 1 – 1%
Shrub Cover: Mean 0.3%, Range 0 – 1%
Herb Cover: Mean 71.0%, Range 55 – 86%

Surface Covers:

Large Rock: Mean 0.0%, Range 0 – 0%
Small Rock: Mean 3.7%, Range 0 – 10%
Fines: Mean 58.3%, Range 25 – 79%
Litter: Mean 27.7%, Range 3 – 70%

Surveys Used in Description (N =3): MOJA9550, MOJA9552, MOJD0010

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Washingtonia filifera	33	0.3	1.0	1.0				
Shrub									
	Isocoma acradenia	33	0.1	0.2	0.2				
	Atriplex hymenelytra	33	0.1	0.2	0.2				
	Suaeda moquinii	33	0.1	0.2	0.2				
Herb									
	Juncus cooperi	100	40.0	35.0	45.0	Y	Y		Y
	Distichlis spicata	100	21.7	20.0	25.0	Y		Y	Y
	Typha	67	6.2	0.5	18.0				Y
	Juncus arcticus	33	2.7	8.0	8.0				
	Phragmites australis	33	0.7	2.0	2.0				
	Helianthus annuus	33	0.1	0.2	0.2				
	Nicolletia occidentalis	33	0.1	0.2	0.2				
	Anemopsis californica	33	0.1	0.2	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Pleuraphis rigida Herbaceous Alliance

Common Name: Big galleta shrub-steppe

NVC Alliance Code: A3170. *Pleuraphis rigida* Desert Grassland Alliance

Associations	Sample Size	NVC Code
Pleuraphis rigida	15	CEPP006858
Pleuraphis rigida / Ambrosia dumosa	3	CEGL000955

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 582 m, Range 293 – 921 m
Slope: Mean 3°, Range 1 – 9°
Aspect: Mostly west-facing

Tree Cover: 0%
Shrub Cover: Mean 2.1%, Range 0 – 10%
Herb Cover: Mean 14.4%, Range 2 – 26%

Surface Covers:

Large Rock: 0%
Small Rock: Mean 0.2%, Range 0 – 3%
Fines: Mean 93.3%, Range 88 – 100%
Litter: Mean 1.8%, Range 0 – 5%

Conservation Status Rank: Global: G3; **State (California):** S2

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**18**	

Surveys Used in Description (N = 18): MOJA0400, MOJA0549, MOJA0654, MOJA9189, MOJA9408, MOJA9660, MOJA9662, MOJA9679, MOJC0020, MOJC0139, MOJC0728, MOJC0729, MOJC0730, MOJC0736, MOJJE144, MOJJE293, MOJJE321, MOJJE327

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	67	1.8	0.2	8.0				Y

	Ambrosia dumosa	33	3.3	0.2	45.0			
	Petalonyx thurberi	33	0.2	0.1	1.5			
Herb								
	Pleuraphis rigida	94	25.2	3.0	93.0	Y	Y	Y
	Schismus	78	1.0	0.2	5.0	Y		Y
	Oenothera deltoides	44	0.1	0.2	0.5			
	Stephanomeria exigua	39	0.1	0.2	0.2			
	Panicum urvilleanum	33	0.5	0.2	3.0			
	Cryptantha	33	0.1	0.2	0.5			
	Achnatherum hymenoides	28	0.3	0.2	3.0			
	Pectocarya	28	0.1	0.2	0.5			
	Chaenactis stevioides	28	0.1	0.2	0.5			
	Malacothrix glabrata	28	0.1	0.2	0.5			
	Rafinesquia neomexicana	28	0.1	0.2	0.2			
	Rumex hymenosepalus	28	0.1	0.2	0.2			
	Croton californicus	22	0.1	0.5	1.0			
	Tiquilia plicata	22	0.1	0.2	0.5			
	Cryptantha pterocarya	22	0.1	0.2	0.5			

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Pleuraphis rigida Association

Common Name: Big Galleta Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 550 m, Range 293 – 801 m
Slope: Mean 3°, Range 1 – 9°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 2.1%, Range 0 – 10%
Herb Cover: Mean 14.4%, Range 2 – 26%

Surface Covers:

Large Rock: 0%
Small Rock: Mean 0.2%, Range 0 – 3%
Fines: Mean 93.3%, Range 88 – 100%
Litter: Mean 1.8%, Range 0 – 5%

Surveys Used in Description (N =15): MOJA0400, MOJA0549, MOJA0654, MOJA9189, MOJA9408, MOJA9660, MOJA9662, MOJA9679, MOJC0020, MOJC0139, MOJC0728, MOJC0729, MOJC0730, MOJC0736, MOJJE321

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	60	1.0	0.2	6.0				Y
	Petalonyx thurberi	40	0.2	0.1	1.5				
	Ambrosia dumosa	20	0.1	0.2	0.5				
Herb									
	Pleuraphis rigida	93	15.9	3.0	93.0	Y	Y		Y
	Schismus	93	1.2	0.2	5.0	Y			Y
	Oenothera deltoides	53	0.1	0.2	0.5				Y
	Stephanomeria exigua	47	0.1	0.2	0.2				
	Panicum urvilleanum	40	0.6	0.2	3.0				
	Cryptantha	40	0.1	0.2	0.5				
	Pectocarya	33	0.1	0.2	0.5				
	Malacothrix glabrata	33	0.1	0.2	0.5				
	Chaenactis stevioides	33	0.1	0.2	0.5				
	Rafinesquia neomexicana	33	0.1	0.2	0.2				
	Rumex hymenosepalus	33	0.1	0.2	0.2				
	Croton californicus	27	0.2	0.5	1.0				

Achnatherum hymenoides	27	0.1	0.2	1.0
Tiquilia plicata	27	0.1	0.2	0.5
Cryptantha pterocarya	27	0.1	0.2	0.5
Plagiobothrys	20	0.2	0.2	2.0
Machaeranthera canescens	20	0.1	0.2	1.0
Dicoria canescens	20	0.1	0.2	0.5

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Sphaeralcea (ambigua, coccinea, parvifolia) Herbaceous Alliance

Common Name: Desert globemallow herbaceous scrub

NVC Alliance Code: A4216. *Sphaeralcea ambigua - Sphaeralcea coccinea - Sphaeralcea parvifolia* Dry Meadow Alliance

Associations	Sample Size	NVC Code
Descurainia pinnata	2	n/a
Sphaeralcea ambigua	8	CEPP009532

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 1617 m, Range 1348 – 1911 m
Slope: Mean 8°, Range 0 – 25°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 1.4%, Range 0 – 3%
Herb Cover: Mean 12.3%, Range 1 – 46%

Surface Covers:

Large Rock: Mean 6.3%, Range 0 – 25%
Small Rock: Mean 51.0%, Range 0 – 98%
Fines: Mean 25.1%, Range 0 – 95%
Litter: Mean 6.1%, Range 0 – 43%

Conservation Status Rank: Global: GNR; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**7**	**3**

Surveys Used in Description (N = 10): DEVA9163, DEVAS147, MOJA9108, MOJA9160, MOJA9294, MOJA9512, MOJC0200, MOJC1099, MOJC1100, SLTN0773

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Stephanomeria pauciflora	40	0.1	0.2	0.5				

	Thamnosma montana	30	0.2	0.2	1.0			
	Gutierrezia sarothrae	30	0.1	0.1	1.0			
	Eriogonum fasciculatum	30	0.1	0.1	0.2			
	Prunus fasciculata	20	0.2	0.2	1.5			
	Purshia glandulosa	20	0.2	0.2	1.5			
	Yucca baccata	20	0.1	0.5	0.5			
	Opuntia polyacantha var. erinacea	20	0.1	0.5	0.5			
	Ephedra nevadensis	20	0.1	0.5	0.5			
	Gutierrezia microcephala	20	0.1	0.5	0.5			
	Larrea tridentata	20	0.1	0.5	0.5			
	Lycium andersonii	20	0.1	0.5	0.5			
	Krameria erecta	20	0.1	0.5	0.5			
	Atriplex canescens	20	0.1	0.2	0.5			
Herb								
	Sphaeralcea ambigua	90	1.1	0.1	4.5	Y		Y
	Bromus rubens	60	1.1	0.1	4.0			Y
	Erodium cicutarium	50	1.6	0.5	4.0			Y
	Achnatherum speciosum	30	0.1	0.2	0.5			
	Bromus tectorum	30	0.1	0.1	0.5			
	Forb (herbaceous, not grass nor grasslike)	30	0.1	0.2	0.3			
	Asteraceae	20	2.1	0.5	20.0			
	Pleuraphis jamesii	20	0.1	0.5	0.5			
	Calochortus kennedyi	20	0.1	0.5	0.5			
	Eriogonum inflatum	20	0.1	0.5	0.5			
	Eriogonum	20	0.0	0.2	0.2			
	Elymus elymoides	20	0.0	0.2	0.2			

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Sphaeralcea ambigua Association

Common Name: Desert Mallow Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 1543 m, Range 1348 – 1854 m
Slope: Mean 10°, Range 1 – 25°
Aspect: Variable

Tree Cover: %
Shrub Cover: Mean 2.0%, Range 1 – 3%
Herb Cover: Mean 5.7%, Range 1 – 15%

Surface Covers:

Large Rock: Mean 7.9%, Range 0 – 25%
Small Rock: Mean 63.8%, Range 10 – 98%
Fines: Mean 12.6%, Range 0 – 35%
Litter: Mean 1.6%, Range 0 – 3%

Surveys Used in Description (N =8): DEVAS147, MOJA9108, MOJA9160, MOJA9294, MOJA9512, MOJC0200, MOJC1099, MOJC1100

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Stephanomeria pauciflora	50	0.1	0.2	0.5				Y
	Thamnosma montana	38	0.2	0.2	1.0				
	Gutierrezia sarothrae	38	0.2	0.1	1.0				
	Eriogonum fasciculatum	38	0.1	0.1	0.2				
	Purshia glandulosa	25	0.2	0.2	1.5				
	Prunus fasciculata	25	0.2	0.2	1.5				
	Krameria erecta	25	0.1	0.5	0.5				
	Gutierrezia microcephala	25	0.1	0.5	0.5				
	Larrea tridentata	25	0.1	0.5	0.5				
	Lycium andersonii	25	0.1	0.5	0.5				
	Yucca baccata	25	0.1	0.5	0.5				
	Ephedra nevadensis	25	0.1	0.5	0.5				
	Opuntia polyacantha var. erinacea	25	0.1	0.5	0.5				
Herb									
	Sphaeralcea ambigua	100	1.4	0.1	4.5	Y			Y
	Bromus rubens	75	1.3	0.1	4.0	Y			Y
	Erodium cicutarium	63	1.9	0.5	4.0				Y

Achnatherum speciosum	38	0.1	0.2	0.5
Calochortus kennedyi	25	0.1	0.5	0.5
Eriogonum inflatum	25	0.1	0.5	0.5
Pleuraphis jamesii	25	0.1	0.5	0.5
Forb (herbaceous, not grass nor grasslike)	25	0.1	0.2	0.3
Eriogonum	25	0.1	0.2	0.2

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Typha (angustifolia, domingensis, latifolia) Herbaceous Alliance

Common Name: Cattail marshes

NVC Alliance Code: A3896. *Typha domingensis - Typha latifolia - Phragmites australis* ssp. *americanus* Western Marsh Alliance

Associations	Sample Size	NVC Code
Phragmites australis ssp. *americanus*	1	CEPP006866
Typha (latifolia, angustifolia)	1	CEGL002010
Typha domingensis	1	CEGL001845

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 811 m, Range 283 – 1485 m
Slope: Mean 1°, Range 0 – 1°
Aspect: Mostly flat

Tree Cover: Mean 2.0%, Range 2 – 2%
Shrub Cover: Mean 17.3%, Range 0 – 50%
Herb Cover: Mean 50.3%, Range 2 – 78%

Surface Covers:

Large Rock: Mean 0.3%, Range 0 – 1%
Small Rock: Mean 6.7%, Range 0 – 10%
Fines: Mean 72.3%, Range 63 – 88%
Litter: Mean 8.2%, Range 0 – 22%

Conservation Status Rank: Global: G5; **State (California):** S5

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**3**	

Surveys Used in Description (N = 3): MOJA9235, MOJC0056, MOJC0846

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Tree									
	Yucca brevifolia	33	0.2	0.5	0.5				
Shrub									
	Tamarix ramosissima	67	1.0	1.0	2.0				Y
	Artemisia ludoviciana	33	0.1	0.2	0.2				
	Gutierrezia sarothrae	33	0.1	0.2	0.2				
	Baccharis sergiloides	33	0.1	0.2	0.2				
Herb									
	Typha	67	46.7	65.0	75.0				Y
	Distichlis spicata	67	2.7	2.0	6.0				Y
	Phragmites australis	33	17.0	51.0	51.0				
	Sporobolus airoides	33	2.0	6.0	6.0				
	Juncus cooperi	33	1.7	5.0	5.0				
	Anemone tuberosa	33	0.2	0.5	0.5				
	Heliotropium curassavicum	33	0.2	0.5	0.5				
	Nitrophila occidentalis	33	0.2	0.5	0.5				
	Polypogon monspeliensis	33	0.1	0.2	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

SPARSELY VEGETATED TYPES

Atriplex hymenelytra Shrubland Alliance

Common Name: Desert holly scrub

NVC Alliance Code: A0872. *Atriplex hymenelytra* Scrub Alliance

Associations	Sample Size	NVC Code
Atriplex hymenelytra	9	CEGL001317
Atriplex hymenelytra – Ambrosia dumosa	5	CEGL005740
Atriplex hymenelytra – Larrea tridentata	4	CEGL001264
Atriplex hymenelytra – Tidestromia oblongifolia	1	CEGL005741
Atriplex hymenelytra Sparse	3	CEPP005798

Classification Comments: None.

Plot/Sample Data Summary:

Elevation: Mean 624 m, Range 268 – 1244 m
Slope: Mean 11°, Range 1 – 37°
Aspect: Mostly west-facing

Tree Cover: 0%
Shrub Cover: Mean 5.8%, Range 1 – 14%
Herb Cover: Mean 2.3%, Range 0 – 7%

Surface Covers:

Large Rock: Mean 15.1%, Range 0 – 75%
Small Rock: Mean 57.9%, Range 20 – 98%
Fines: Mean 20.9%, Range 1 – 63%
Litter: Mean 1.0%, Range 0 – 3%

Conservation Status Rank: Global: G5; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**6**	**2**	**10**	**4**

Surveys Used in Description (N = 22): DEVA9273, DEVA9428, DEVAS019, DEVAS115, DEVAS153, MOJA9183, MOJC0117, MOJC0186, MOJC0689, MOJC0787, MOJC0887, MOJC1061, MOJC1064, MOJC1065, MOJC1169, MOJD0012, MOJD0019, OVAA05380, OVAA09455, OVAA09467, SLTN0610, SLTN0853

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Atriplex hymenelytra	100	3.6	0.2	14.0	Y	Y		Y
	Ambrosia dumosa	73	0.7	0.2	2.0				Y
	Larrea tridentata	68	0.6	0.1	4.0				Y
	Atriplex confertifolia	27	0.2	0.2	2.0				
Herb									
	Chorizanthe rigida	45	0.1	0.1	0.5				
	Schismus	36	0.6	0.2	7.0				
	Cryptantha	32	0.1	0.1	0.5				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Atriplex hymenelytra Association

Common Name: Desert-holly Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 590 m, Range 310 – 1218 m
Slope: Mean 13°, Range 1 – 37°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 8.3%, Range 2 – 14%
Herb Cover: Mean 3.2%, Range 0 – 7%

Surface Covers:

Large Rock: Mean 23.1%, Range 0.2 – 75%
Small Rock: Mean 43.3%, Range 20 – 68%
Fines: Mean 17.8%, Range 1 – 63%
Litter: Mean 1.2%, Range 0 – 3%

Surveys Used in Description (N =9): DEVA9428, MOJA9183, MOJC0117, MOJC0689, MOJC0887, MOJD0012, MOJD0019, OVAA09467, SLTN0853

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Atriplex hymenelytra	100	6.4	3.0	14.0	Y	Y		Y
	Ambrosia dumosa	67	0.5	0.2	1.5				Y
	Larrea tridentata	56	0.3	0.2	1.5				Y
	Atriplex confertifolia	33	0.3	0.2	2.0				
	Encelia farinosa	33	0.3	0.2	1.5				
	Standing snag	22	0.3	1.0	2.0				
	Opuntia basilaris	22	0.1	0.2	1.0				
	Pleurocoronis pluriseta	22	0.1	0.2	0.5				
	Eucnide urens	22	0.1	0.2	0.5				
	Suaeda moquinii	22	0.0	0.1	0.2				
Herb									
	Chorizanthe rigida	78	0.2	0.1	0.5	Y			Y
	Cryptantha	56	0.2	0.1	0.5				Y
	Atrichoseris platyphylla	33	0.1	0.1	0.2				
	Schismus	22	0.8	0.2	7.0				
	Eriogonum	22	0.1	0.1	1.0				
	Perityle emoryi	22	0.0	0.2	0.2				
	Phacelia	22	0.0	0.2	0.2				

	Eremalche rotundifolia	22	0.0	0.2	0.2
	Camissonia brevipes	22	0.0	0.2	0.2
	Xylorhiza tortifolia	22	0.0	0.2	0.2
	Lepidium lasiocarpum	22	0.0	0.2	0.2
	Plantago ovata	22	0.0	0.1	0.2
Non-vascular					
	Cryptogammic crust	33	0.3	0.5	1.0

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Atriplex hymenelytra – Larrea tridentata Association

Common Name: Desert-holly - Creosote Bush - White Bursage Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 704 m, Range 598 – 795 m
Slope: Mean 9°, Range 2 – 26°
Aspect: Mostly west-facing

Tree Cover: 0%
Shrub Cover: Mean 6.3%, Range 3 – 12%
Herb Cover: Mean 2.3%, Range 1 – 4%

Surface Covers:

Large Rock: Mean 2.5%, Range 2 – 3%
Small Rock: Mean 70.0%, Range 23 – 90%
Fines: Mean 23.6%, Range 10 – 63%
Litter: Mean 0.4%, Range 0 – 1%

Surveys Used in Description (N =4): DEVA9273, MOJC0186, MOJC0787, MOJC1169

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Atriplex hymenelytra	100	2.4	1.0	5.0	Y		Y	Y
	Larrea tridentata	100	2.1	1.0	4.0	Y		Y	Y
	Ambrosia dumosa	75	0.8	0.5	2.0	Y			Y
	Stephanomeria pauciflora	25	0.3	1.0	1.0				
	Atriplex polycarpa	25	0.3	1.0	1.0				
	Eriogonum fasciculatum	25	0.1	0.5	0.5				
	Atriplex confertifolia	25	0.1	0.5	0.5				
	Salazaria mexicana	25	0.1	0.5	0.5				
	Psorothamnus	25	0.1	0.5	0.5				
Herb									
	Eriogonum inflatum	50	0.4	0.5	1.0				Y
	Schismus	25	1.0	4.0	4.0				
	Erodium cicutarium	25	0.3	1.0	1.0				
	Geraea canescens	25	0.1	0.5	0.5				
	Cuscuta	25	0.1	0.5	0.5				
	Bromus rubens	25	0.1	0.5	0.5				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft

= Often

Atriplex hymenelytra Sparse Association

Common Name: Desert-holly Sparse Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 356 m, Range 272 – 475 m
Slope: Mean 9°, Range 2 – 15°
Aspect: Mostly west-facing

Tree Cover: 0%
Shrub Cover: Mean 1.8%, Range 1 – 3%
Herb Cover: Mean 0.8%, Range 1 – 1%

Surface Covers:

Large Rock: Mean 15.6%, Range 1 – 43%
Small Rock: Mean 62.0%, Range 46 – 75%
Fines: Mean 25.8%, Range 10 – 38%
Litter: Mean 1.4%, Range 0 – 3%

Surveys Used in Description (N =3): DEVAS019, DEVAS115, MOJC1064

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Atriplex hymenelytra	100	1.0	0.5	2.0	Y	Y		Y
	Larrea tridentata	100	0.4	0.1	0.5	Y			Y
	Ambrosia dumosa	67	0.3	0.5	0.5				Y
	Hymenoclea salsola	33	0.2	0.5	0.5				
	Encelia virginensis	33	0.2	0.5	0.5				
Herb									
	Schismus	33	0.2	0.5	0.5				
	Chorizanthe rigida	33	0.2	0.5	0.5				
	Chaenactis carphoclinia	33	0.0	0.1	0.1				
	Camissonia	33	0.0	0.1	0.1				
	Mentzelia	33	0.0	0.1	0.1				
	Plantago ovata	33	0.0	0.1	0.1				
	Forb (herbaceous, not grass nor grasslike)	33	0.0	0.1	0.1				
	Camissonia boothii	33	0.0	0.1	0.1				
	Cryptantha	33	0.0	0.1	0.1				
	Eriogonum inflatum	33	0.0	0.1	0.1				
	Aliciella latifolia	33	0.0	0.1	0.1				
	Lepidium virginicum	33	0.0	0.1	0.1				

Pectocarya recurvata	33	0.0	0.1	0.1
Boraginaceae	33	0.0	0.1	0.1

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Chorizanthe rigida – Geraea canescens Desert Pavement Sparsely Vegetated Alliance

Common Name: Rigid spineflower – hairy desert sunflower

NVC Alliance Code: A4024. *Chorizanthe rigida - Geraea canescens* Desert Pavement Alliance

Associations	Sample Size	NVC Code
Aliciella latifolia – Nama pusillum – Phacelia rotundifolia (Provisional)	6	n/a
Chorizanthe rigida – Geraea canescens Desert Pavement	6	CEGL009686
Chorizanthe rigida – Geraea canescens Desert Pavement (alliance)	1	A4024

Classification Comments: None.

Plot/Sample Data Summary:
Elevation: Mean 425 m, Range 219 – 661 m
Slope: Mean 2°, Range 0 – 7°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 0.4%, Range 0 – 1%
Herb Cover: Mean 4.7%, Range 0 – 11%

Surface Covers:
Large Rock: Mean 1.5%, Range 0 – 8%
Small Rock: Mean 65.5%, Range 0 – 98%
Fines: Mean 33.8%, Range 1 – 99%
Litter: Mean 0.3%, Range 0 – 1%

Conservation Status Rank: Global: G4; **State (California):** S4

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**1**	**6**	**6**	

Surveys Used in Description (N = 13): DEVA9291, EMOP0001, EMOP0002, EMOP0003, EMOP0004, EMOP0005, MOJA9182, MOJC1063, MOJD0024, MOJD0100, MOJD0111, MOJDR109, SLTN1083

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	46	0.2	0.2	1.0				
	Ambrosia dumosa	31	0.1	0.2	1.0				
Herb									
	Chorizanthe rigida	54	0.6	0.1	7.0				Y
	Plantago ovata	46	1.4	0.2	10.0				
	Aliciella latifolia	46	0.5	0.2	3.0				
	Schismus	46	0.2	0.2	1.0				
	Nama pusillum	38	0.6	0.2	3.0				
	Cryptantha	38	0.1	0.2	1.0				
	Eremalche rotundifolia	38	0.1	0.2	0.2				
	Geraea canescens	31	0.1	0.2	1.0				
	Phacelia rotundifolia	23	0.3	1.0	2.0				
	Chaenactis carphoclinia	23	0.1	0.2	1.0				
	Cryptantha angustifolia	23	0.1	0.2	0.4				
	Chaenactis fremontii	23	0.0	0.2	0.2				
	Oligomeris linifolia	23	0.0	0.2	0.2				
	Monoptilon	23	0.0	0.1	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Chorizanthe rigida – Geraea canescens Desert Pavement Association

Common Name: Rigid spineflower - Hairy desert sunflower Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 392 m, Range 219 – 661 m
Slope: Mean 1°, Range 0 – 2°
Aspect: Mostly flat

Tree Cover: 0%
Shrub Cover: Mean 0.2%, Range 0 – 1%
Herb Cover: Mean 6.7%, Range 0 – 11%

Surface Covers:

Large Rock: Mean 1.8%, Range 0 – 8%
Small Rock: Mean 41.4%, Range 0 – 85%
Fines: Mean 56.4%, Range 7 – 99%
Litter: Mean 0.3%, Range 0 – 1%

Surveys Used in Description (N =6): DEVA9291, EMOP0002, EMOP0003, MOJA9182, MOJD0024, SLTN1083

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	50	0.2	0.2	1.0				Y
Herb									
	Plantago ovata	50	2.8	3.0	10.0				Y
	Chorizanthe rigida	50	1.2	0.1	7.0				Y
	Schismus	50	0.2	0.2	1.0				Y
	Cryptantha	50	0.2	0.2	1.0				Y
	Geraea canescens	50	0.2	0.2	1.0				Y
	Atriplex elegans	33	1.0	0.2	6.0				
	Amsinckia	33	0.1	0.2	0.2				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Chorizanthe rigida – Geraea canescens Desert Pavement Association

Dicoria canescens – Abronia villosa – Panicum urvilleanum Sparsely Vegetated Alliance

Common Name: Mojave-Sonoran desert dunes

NVC Alliance Code: A4026. *Dicoria canescens - Abronia villosa - Panicum urvilleanum* Dune Alliance

Associations	Sample Size	NVC Code
(Dicoria canescens) – Salsola tragus (Provisional)	4	n/a
Cleomella obtusifolia – Cleome sparsifolia – Psathyrote spp. (Provisional)	11	n/a
Dicoria canescens	7	CEGL005747
Dicoria canescens – Abronia villosa – Panicum urvilleanum (alliance)	1	A4026
Oenothera deltoides – Cryptantha spp.	3	CEPP006728
Panicum urvilleanum	5	CEPP006730
Petalonyx thurberi	6	CEPP006731

Classification Comments: None.

Plot/Sample Data Summary:
Elevation: Mean 715 m, Range 291 – 1146 m
Slope: Mean 5°, Range 1 – 23°
Aspect: Variable

Tree Cover: 2%
Shrub Cover: Mean 2.7%, Range 0 – 20%
Herb Cover: Mean 3.7%, Range 0 – 18%

Surface Covers:
Large Rock: Mean 1.0%, Range 0 – 15%
Small Rock: Mean 4.2%, Range 0 – 40%
Fines: Mean 85.9%, Range 0 – 100%
Litter: Mean 0.8%, Range 0 – 3%

Conservation Status Rank: Global: G4; **State (California):** S3

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size			**37**	

Surveys Used in Description (N = 37): DEVA0540, DEVAS022, DEVAS181, DEVAS182, DEVAS183, DEVAS184, DEVAS185, MOJA0405, MOJA0678, MOJA9188, MOJA9197, MOJA9406, MOJA9407, MOJA9548, MOJC0346, MOJC0347, MOJC0348, MOJC0349, MOJC0692, MOJC0731, MOJC0855, MOJC0857, MOJC0858, MOJC0859, MOJC0860, MOJC0861, MOJC0862, OVAA08155, OVAA08159, OVAA09457, OVAA09462, OVAA09474, OVAA09480, OVAA09481, OVAA09484, OVAA09488, OVAA09495

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Petalonyx thurberi	43	1.4	0.0	20.0				
	Atriplex parryi	24	0.0	0.2	0.2				
	Larrea tridentata	22	0.4	0.0	10.0				
Herb									
	Dicoria canescens	35	0.3	0.1	3.5				
	Schismus	27	0.5	0.2	8.0				
	Salsola	27	0.3	0.2	5.0				
	Cleomella obtusifolia	27	0.3	0.2	4.0				
	Achnatherum hymenoides	22	0.2	0.2	4.0				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Dicoria canescens Association

Common Name: Desert dicoria Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 611 m, Range 319 – 742 m
Slope: Mean 3°, Range 1 – 9°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 1.0%, Range 0 – 2%
Herb Cover: Mean 2.5%, Range 1 – 7%

Surface Covers:

Large Rock: Mean 0.0%, Range 0 – 0%
Small Rock: Mean 5.4%, Range 0 – 38%
Fines: Mean 88.7%, Range 63 – 100%
Litter: Mean 0.5%, Range 0 – 2%

Surveys Used in Description (N =7): DEVA0540, DEVAS184, MOJA9197, MOJC0346, MOJC0347, MOJC0348, MOJC0692

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Petalonyx thurberi	57	0.2	0.0	0.5				Y
	Larrea tridentata	43	0.4	0.0	1.5				
Herb									
	Dicoria canescens	86	1.3	0.1	3.5	Y		Y	Y
	Achnatherum hymenoides	43	0.3	0.5	1.0				
	Astragalus lentiginosus	29	0.3	0.2	2.0				
	Rumex hymenosepalus	29	0.1	0.5	0.5				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

Oenothera deltoides – Cryptantha spp. Provisional Association

Common Name: Association

Classification Comments: None

Plot/Sample Data Summary:

Elevation: Mean 333 m, Range 315 – 344 m
Slope: Mean 1°, Range 1 – 2°
Aspect: Mostly south-facing

Tree Cover: 0%
Shrub Cover: 1%
Herb Cover: 0%

Surface Covers:

Large Rock: 0%
Small Rock: Mean 1.9%, Range 0 – 3%
Fines: Mean 87.5%, Range 88 – 88%
Litter: Mean 1.7%, Range 0 – 3%

Surveys Used in Description (N =3): MOJC0855, MOJC0857, MOJC0860

Association Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Larrea tridentata	67	0.7	0.5	1.5				Y
Herb									
	Oenothera deltoides	100	0.5	0.5	0.5	Y			Y
	Cryptantha	100	0.5	0.5	0.5	Y			Y
	Schismus	67	2.3	3.0	4.0				Y
	Camissonia	67	0.3	0.5	0.5				Y
	Salsola	67	0.3	0.5	0.5				Y
	Plantago ovata	33	0.3	1.0	1.0				
	Allionia incarnata	33	0.2	0.5	0.5				
	Dithyrea californica	33	0.2	0.5	0.5				
	Geraea canescens	33	0.2	0.5	0.5				
	Langloisia setosissima	33	0.2	0.5	0.5				
	Astragalus	33	0.2	0.5	0.5				
	Palafoxia arida	33	0.2	0.5	0.5				
	Plant	33	0.2	0.5	0.5				
	Antheropeas	33	0.2	0.5	0.5				

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft

= Often

Oenothera deltoides – Cryptantha spp. ProvisionalAssociation

Peucephyllum schottii – Pleurocoronis pluriseta Sparsely Vegetated Alliance

Common Name: Schott's pygmy-cedar – bush arrowleaf sparse scrub

NVC Alliance Code: A3143. *Peucephyllum schottii - Pleurocoronis pluriseta* Scrub Alliance

Associations	Sample Size	NVC Code
Peucephyllum schottii – Pleurocoronis pluriseta – Eucnide urens	5	CEGL005770

Classification Comments: The association circumscription is the same as that of the alliance.

Plot/Sample Data Summary:

Elevation: Mean 851 m, Range 624 – 1121 m
Slope: Mean 28°, Range 6 – 45°
Aspect: Variable

Tree Cover: 0%
Shrub Cover: Mean 8.1%, Range 1 – 21%
Herb Cover: Mean 1.2%, Range 0 – 3%

Surface Covers:

Large Rock: Mean 61.3%, Range 15 – 100%
Small Rock: Mean 31.9%, Range 5 – 58%
Fines: Mean 7.5%, Range 3 – 20%
Litter: Mean 1.0%, Range 0 – 3%

Conservation Status Rank: Global: G3; State (California): SNR

Surveys by Region:

Region	SV	WMT	Other	Other
USDA Section	Mojave 322A	Mojave 322A	Mojave 322A	sGB 341F
Sample size	**1**	**2**		**2**

Surveys Used in Description (N = 5): DEVAS116, MOJC0317, MOJC0462, MOJC0925, MOJDR102

Alliance Stand Table:

Layer	Taxon	Con	Avg	Min	Max	Ch	D	cD	Oft
Shrub									
	Peucephyllum schottii	80	1.2	0.2	3.5	Y			Y

	Encelia farinosa	80	1.2	0.2	3.5	Y	Y
	Pleurocoronis pluriseta	80	0.7	0.5	1.0	Y	Y
	Eucnide urens	60	0.2	0.1	0.5		Y
	Viguiera reticulata	40	0.5	0.5	2.0		
	Stephanomeria pauciflora	40	0.3	0.5	1.0		
	Eriogonum fasciculatum	40	0.2	0.2	1.0		
	Lepidium fremontii	40	0.2	0.5	0.5		
	Galium stellatum	40	0.2	0.5	0.5		
	Bebbia juncea	20	0.6	3.0	3.0		
	Brickellia microphylla	20	0.4	2.0	2.0		
	Ambrosia dumosa	20	0.4	2.0	2.0		
	Salazaria mexicana	20	0.3	1.5	1.5		
	Psorothamnus arborescens	20	0.2	1.0	1.0		
	Ephedra funerea	20	0.2	1.0	1.0		
	Encelia virginensis	20	0.1	0.5	0.5		
	Echinocactus polycephalus	20	0.1	0.5	0.5		
	Amphipappus fremontii	20	0.1	0.5	0.5		
	Ericameria cuneata	20	0.1	0.5	0.5		
	Ephedra nevadensis	20	0.1	0.5	0.5		
	Gutierrezia microcephala	20	0.1	0.5	0.5		
	Opuntia basilaris	20	0.1	0.5	0.5		
	Salvia mohavensis	20	0.1	0.5	0.5		
	Brickellia desertorum	20	0.1	0.5	0.5		
	Shrub	20	0.0	0.1	0.1		
Herb							
	Sphaeralcea ambigua	60	0.2	0.2	0.5		Y
	Cheilanthes parryi	40	0.2	0.5	0.5		
	Xylorhiza tortifolia	40	0.1	0.2	0.5		
	Eriogonum inflatum	40	0.1	0.1	0.5		
	Mirabilis laevis	20	0.2	1.0	1.0		
	Perityle emoryi	20	0.2	1.0	1.0		
	Plant	20	0.1	0.5	0.5		
	Bromus rubens	20	0.1	0.5	0.5		
	Cymopterus	20	0.1	0.5	0.5		
	Achnatherum speciosum	20	0.1	0.5	0.5		
	Erodium cicutarium	20	0.1	0.5	0.5		
	Nicotiana obtusifolia	20	0.1	0.5	0.5		
	Schismus	20	0.1	0.5	0.5		
	Mirabilis	20	0.1	0.5	0.5		
	Minuartia	20	0.1	0.5	0.5		

	Forb (herbaceous, not grass nor grasslike)	20	0.0	0.2	0.2
	Lepidium lasiocarpum	20	0.0	0.2	0.2
	Senecio mohavensis	20	0.0	0.2	0.2
	Aristida purpurea	20	0.0	0.2	0.2
	Nicotiana attenuata	20	0.0	0.1	0.1
Non-vascular					
	Moss	40	1.7	0.5	8.0
	Cryptogammic crust	40	0.2	0.5	0.5
	Lichen	20	0.2	1.0	1.0

Con = Constancy, Avg = Average Absolute Cover, Min = Minimum Absolute Cover, Max = Maximum Absolute Cover, Ch = Characteristic, D = Dominant, cD = Co-dominant, Oft = Often

APPENDIX I - Contingency Table for the Searles Valley and West Mojave Trails A Study Area

The following contingency table is for the Searles Valley and West Mojave Trails A study area, giving the user a regional perspective of the types encountered in the region. Contingency tables are only for the mapped Alliance level of the classification.

Contingency Table the Searles Valley and West Mojave Trails A Study Area

Anal Call

PI Call	Acacia greggii – Hyptis emoryi – Justicia californica Alliance	Allenrolfea occidentalis Alliance	Ambrosia dumosa Alliance	Ambrosia salsola – Bebbia juncea Alliance	Atriplex confertifolia Alliance	Atriplex hymenelytra Alliance	Atriplex polycarpa Alliance	Chilopsis linearis – Psorothamnus spinosus Alliance	Chorizanthe rigida–Geraea canescens Dsrt Pvmt Sparse Veg All	Encelia farinosa Alliance	Ephedra californica Alliance	Ericameria paniculata Alliance	Larrea tridentata – Ambrosia dumosa Alliance	Larrea tridentata – Encelia farinosa Alliance	Lepidospartum squamatum Alliance	Mud Hills sparsely vegetated ephemeral herbs Mapping Unit	Peucephyllum schottii – Pleurocoronis pluriseta Alliance	Prosopis glandulosa – Prosopis velutina – Prosopis pubescens Alliance	Psorothamnus fremontii – Psorothamnus polydenius Alliance	Sparsely vegetated playa Mapping Unit	Suaeda moquinii – Isocoma acradenia Alliance	Unvegetated wash and river bottom Mapping Unit	Total
Acacia greggii - Hyptis emoryi - Justicia californica Alliance	2		1	1				1								1						6	12
Allenrolfea occidentalis Alliance		8																	2	2			12
Ambrosia dumosa Alliance			3				1															4	8
Ambrosia salsola - Bebbia juncea Alliance				3																		1	4
Atriplex confertifolia Alliance					1																		1
Atriplex hymenelytra Alliance						4	2			1												7	14
Atriplex polycarpa Alliance							3	1														2	6
Chilopsis linearis - Psorothamnus spinosus Alliance				1				2														2	5
Chorizanthe rigida - Geraea canescens Desert Pavement Sparsely Vegetated Alliance									7														7
Encelia farinosa Alliance										3												6	9
Ephedra californica Alliance				1							5												6
Ericameria paniculata Alliance												6											6
Larrea tridentata - Ambrosia dumosa Alliance													1										1
Larrea tridentata - Encelia farinosa Alliance														1									1
Lepidospartum squamatum Alliance															7								7
Mud Hills sparselv vegetated ephemeral herbs Ma ooing Unit																2							2
Peucephyllum schottii - Pleurocoronis pluriseta Alliance																	7						7
Prosopis glandulosa - Prosopis velutina - Prosopis pubescens Alliance																		1					1
Psorothamnus fremontii - Psorothamnus polydenius Alliance																			10				10
Sparsely vegetated playa Mapping Unit																				9			9
Suaeda moquinii - Isocoma aeradenia Alliance			1																		3		3
Unvegetated wash and river bottom Mapping Unit																						124	124
Total	2	8	6	6	1	5	6	12	8	4	5	5	9	6	1	1	7	2	7	1	10	9	3	

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